

Benefits of Fungicide Seed Treatment on Corn Establishment, Vigor, and Yield

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Introduction

Cold and wet planting conditions predispose corn seedlings to infection with soil-borne pathogens like *Rhizoctonia solani*, *Fusarium* spp., and *Pythium* spp. Corn fungicide seed treatments reduced soil-borne pathogen infection, and thus increased corn seedling vigor. Field performance of corn grown from seed treated with experimental fungicide seed treatment packs was evaluated.

Material and Methods

This experiment was planted at the Southeast Research Farm, April 19, 2007. Soil temperature at a 4-in. depth was 50°F. Soil was chisel plowed in the fall of 2006 and disk/field cultivated before planting. Fertilizer (175 lb/acre N) was applied (Anhydrous Ammonia 82.5-0-0). Corn seed samples (Garst® Hybrid G-8545) were treated with fungicide seed treatment slurries (7 g slurry/kg seed). Samples were treated with either Cruiser Extreme 250®; 12.5 g a.i./100 kg seed, A14918E (25.5 g a.i./100 kg seed) and Trilex® (10 g ai/100 kg seed) + Allegiance® (1.34 mg a.i./kernel) + Vortex® (2.5 g ai/100 kg seed). This was planted with a plot planter (35,000 plants/acre), and experimental design was a randomized block design with four treatments and five blocks for a total of 20 plots. Plant stand, plant height, and yield were assessed. Corn was harvested with a plot combine and yield was adjusted to 15.5% moisture.

Results and Discussion

Cold (50°F) and wet soil conditions at planting severely impacted corn establishment. The plant populations of corn grown from fungicide treated seed at 21 days after emergence (dae) were greater (31,300 to 31,800 plants/acre) ($P < .001$) than the plant population of corn grown from untreated seed (14,600 plants/acre) at 21 dae (Table 1). There was no difference ($P > .05$) in the plant population between the three fungicide seed treatments. There was no difference in plant height recorded between plants grown from fungicide treated corn seed ($P = .76$). Corn seedling vigor was more uniform in seedlings grown from seed treated with A14918E (St dev = 2.37) and Trilex®-Vortex®-Allegiance® (St dev = 2.39) compared with Cruiser Extreme 250® (St dev = 2.96). Corn grown from untreated seed yielded much less than treated corn seed and no differences in yield for corn grown from treated seed were recorded.

A14918E and Trilex®-Allegiance®-Vortex® experimental fungicide seed treatment packs increased yield and did not show symptoms of phytotoxicity on treated plants. These results are a continuation of a laboratory-growth chamber study to determine the efficacy of these experimental compounds against *Fusarium verticillioides* colonization of roots and mesocotyl tissues of corn.

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Table 1. Stand counts (plants/acre) at 7, 14, and 21 dae, plant height (cm) at 21 dae, and yield (adjusted @ 15.5% moisture) of corn grown from seed treated with Cruiser Extreme 250®, A14918E, and Vortex®-Trilex®-Allegiance® or left untreated.

	Plant stand			Plant height	Yield
	7 dae	14 dae	21 dae	21 dae	
Untreated	400 (894.4) ¹ a ²	13,700 (3,271)a	14,600 (2815.1)a	8.5 (2.9)a	112a
Cruiser Extreme 250®	4,600 (6377.7)b	32,100 (651.9)b	31,800 (447.2)b	12.2 (2.96)b	198b
A14918E	4,400 (4393.2)b	30,800 (2,168)b	31,700 (273.86)b	11.9 (2.37)b	193b
Vortex®-Trilex®-Allegiance®	2,700 (3,213.3)b	31,500 (612.37)b	31,300 (570.1)b	12.5 (2.39)b	187b

¹Standard deviation.²Values followed by the same letter are not significantly different; according to the Tukey-Kramer multiple comparisons test (P < .05).