

On-Farm Corn and Soybean Seed Treatment Demonstration Trials

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Introduction

Seed treatments offer protection to germinating seeds and developing seedlings from fungi, insects, and nematodes. Some seed treatments can supply nutrients to the developing corn or soybean seedling. The purpose of these trials was to see what effect various seed treatments have on corn and soybean yields.

Materials and Methods

In 2019, 11 trials examined the use of corn and soybean seed treatments to increase yield (Table 1). Some trials were conducted on-farm by farmer cooperators using the farmer's equipment and some trials were conducted on research farms. Seed treatments were applied with the planter and were arranged in a randomized complete block design with at least three replications per treatment. Plot size varied from field-to-field depending on equipment size and the size of the field. All plots were machine harvested for grain yield.

In Trials 1, 7, 8, and 11, corn was planted with the seed treatment Envita™ at 3.2-4 oz/acre and compared with no seed treatment (Table 2). Envita™ is marketed by Azotic as nitrogen fixing bacteria. In Trial 2, PMZ Dry at 3 oz/50

lb of seed was applied to corn seed and compared with no seed treatment. In Trials 6 and 10, PMZ Dry at 3 oz/hopper was applied to corn seed and compared with no seed treatment. In Trial 3, PMZ Dry at 3 oz/hopper was applied to soybean seed and compared with no seed treatment. PMZ Dry is marketed by Rocket Seeds™ as a flow agent with the nutrients N, P, Mn, and Zn. In Trials 4 and 5, soybean with Agrishield® ST treated seed was compared with soybean without a seed treatment. Agrishield® ST contains three fungicides.

Results and Discussion

Envita™ had no effect on corn yield in three trials and decreased the yield by 16 bushels/acre in one trial (Table 2). It is unknown why the Envita™ seed treatment may have reduced corn yield. PMZ Dry had no effect on corn yield in three trials and no effect on soybean yield in one trial. Agrishield® ST had no effect on soybean yield in two trials. Although some seed treatments can increase corn and soybean yields, none of the seed treatments used in this trial increased corn or soybean yields.

NOTE: The results presented are from replicated demonstration trials. Statistics are used to detect differences at a location and should not be interpreted beyond the single location.

Table 1. Variety, row spacing, planting date, planting population, previous crop, and tillage practices in the 2019 seed treatment trials on corn and soybean.

Exp. no.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/ac)	Previous crop	Tillage
190201	1	Crawford	Hoegmeyer 7558	30	5/2/19	32,000	Corn	Fall disk, spring field cultivate
190203	2	Buena Vista	Champion Seed CSX 52A18 Pro RIB	30	5/4/19	35,000	Soybean	Mulch till
190204	3	Buena Vista	ISU 1022	30	5/4/19	140,000	Corn	Mulch till
190306	4	Monona	LG C1870R2	30	5/16/19	140,000	Corn	No-till
190307	5	Monona	LG C2441R	30	5/18/19	140,000	Corn	No-till
190308	6	Monona	LG 59C66	30	5/16/19	32,000	Soybean	No-till
190311	7	Monona	Golden Harvest G08M20-3120.0-EZ1	30	4/25/19	32,500	Soybean	Disk
190312	8	Monona	Golden Harvest G08D29-3120A-EZ1	30	4/25/19	32,500	Soybean	Disk
190319	9	Monona	LG2620 VT3	30	5/26/19	31,000	Soybean	Conventional
190505	10	Boone	Pioneer PO688AM	30	5/26/19	34,000	Soybean	Fall disk rip spring field cultivate
190608	11	Cass	Eppleys E1712SS	30	5/6/19	32,000	Soybean	No-till

Table 2. Yields for on-farm seed treatment trials in corn and soybean in 2019.

Exp. no.	Trial	Treatment	Yield (bu/ac) ^a	P-value ^b
190201	1	Envita at 4 oz/ac	228 a	1.0
		Control	228 a	
190203	2	PMZ Dry at 3 oz/50 lb of seed	246 a	1.0
		Control	246 a	
190204	3	PMZ Dry at 3 oz/hopper	52 a	0.14
		Control	49 a	
190306	4	Agrishield ST treated seed	56 a	0.27
		Control	57 a	
190307	5	Agrishield ST treated seed	49 a	0.88
		Control	49 a	
190308	6	PMZ Dry at 3 oz/hopper	217 a	0.79
		Control	215 a	
190311	7	Envita at 3.5 oz/ac	179 a	0.02
		Control	195 b	
190312	8	Envita at 3.5 oz/ac	188 a	0.27
		Control	192 a	
190319	9	PMZ Dry at 3 oz/hopper	227 a	0.62
		Control	224 a	
190505	10	PMZ Dry at 3 oz/hopper	180 a	0.24
		Control	187 a	
190608	11	Envita at 3.2 oz/ac	192 a	0.64
		Control	191 a	

^aValues denoted with the same letter within a trial are not statistically different at the significance level of 0.05.

^bP-value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.