

2017

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Recommended Citation

Robertson, Alison; Serrano, Mauricio; and Rees, Myron (2017) "Effects of Commercial Seed Treatments on Soybean Emergence and Yield," *Farm Progress Reports*: Vol. 2016 : Iss. 1 , Article 138.

DOI: <https://doi.org/10.31274/farmprogressreports-180814-1703>

Available at: <https://lib.dr.iastate.edu/farmprogressreports/vol2016/iss1/138>

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Effects of Commercial Seed Treatments on Soybean Emergence and Yield

RFR-A1699

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Introduction

Soybean seed costs have increased more than 50 percent within the past decade. To protect seed from early season insects and diseases, seed often are treated with pesticides. The goal of this trial was to provide information on the effect of commercial seed treatments on stand count, disease incidence and severity, and yield of soybean. The Iowa Soybean Association provided funding for this trial.

Materials and Methods

Soybean variety IA 3014 was planted May 6, 2016. The experimental design was a randomized complete block with four replications. Plot sizes were 10 ft wide (four rows) by 17.5 ft. The seeding rate was 120,000 seed/acre. Seed was sent to each company that took part in the trials, and treatments were applied by the respective companies. At this location, two identical trials were planted, except in one trial the plots were inoculated at planting. For inoculum production, bags with autoclaved millet seed were inoculated with *Pythium sylvaticum*, *P. irregulare*, or *P. ultimum*. The set of inoculated plots received 200cc/plot of a mixture 1:1:1 (*P. sylvaticum*, *P. irregulare*, *P. ultimum*) of infested millet that was applied with the seed at planting. Emergence data were recorded 35 days after planting. Soil samples were collected in plots of treatments

that contained a nematicide and the untreated control. The samples were collected three times during the growing season: at planting (or within 7 days of planting); 45 to 60 days after planting; and at (or shortly after) harvest. The population of soybean cyst nematode (SCN) in each soil sample was determined by counting the number of eggs per 100 cc of soil, and Reproductive Factor (RF) was calculated by dividing the average final SCN population density by the average initial SCN population. Sudden death syndrome (SDS) disease index was assessed at approximately growth stage R6 (August 22). All four rows of each plot were harvested October 19. All data were subjected to analysis of variance. If a treatment effect was detected, a T-test was used to compare each treatment with the non-treated control using $\alpha=0.1$.

Results and Discussion

Soil temperature remained above 55°F for the first seven days after planting and approximately 1 in. of rain fell within this period. An effect of inoculation on stand was detected ($P = 0.001$), but not on yield ($P = 0.392$). No effect of seed treatment on emergence was detected in the non-inoculated trial, but an effect of seed treatment on emergence was detected in the inoculated trial (Table 1). The stand count of only one seed treatment was significantly greater than that of the non-treated control. No effects of seed treatments on yield in either trial were detected. SCN populations were low and there were no effects of seed treatment on SCN populations or RF ($P = 0.8108$ and 0.8147 , respectively). SDS disease pressure was low and no significant effect of seed treatments was observed ($P = 0.1939$).

Table 1. Effect of commercial seed treatments on soybean emergence and yield in plots inoculated with *Pythium* spp. and non-inoculated plots at Crawfordsville, IA, 2016.

Treatment	Stand (% emergence)		Yield (bu/ac) ^x	
	Inoculated with <i>Pythium</i> spp.	Non-inoculated	Inoculated with <i>Pythium</i> spp.	Non-inoculated
CruiserMaxx Vibrance	88	92	47.8	52.7
Clariva Complete Beans	86	91	57.8	43.5
Clariva Complete Beans + Mertect	90	90	51.5	56.5
Proline + Trilex Flowable + Allegience + Ponchop/VOTiVO + ILeVO	91	92	62.9	61.1
Evergol Energy + Allegience + Ponchop/VOTiVO + ILeVO	91	94	66.5	59.0
Proline + fluaxastrobin + Allegience + Ponchop/VOTiVO + ILeVO	80	87	69.7*	62.0
Evergol Energy + Allegience + Ponchop/VOTiVO + ILeVO	91	90	46.8	43.5
Acceleron (pyraclostrobin + fluxapyroxad + metalaxyl + imidocloprid)	93	87	58.5	47.9
Acceleron + Vault HP + Integral	88	85	47.2	55.0
Acceleron + Vault HP + Integral + Flo Rite	84	89	54.3	58.3
Rancona 3.8 FS + Belmont + Attendant	90	88	49.1	53.0
Rancona 3.8 FS + Belmont + Attendant + ALS-1006	91	92	61.3	52.9
Rancona V00 Pro + Belmont + Attendant	86	92	57.6	63.4
Non-treated	90	95	57.8	58.7
P-value	0.2928	0.3382	0.0331	0.1359

*Significantly different than the non-treated control using T-test at alpha=0.1