



Investigation of Soybean Seed Treatment and Inoculant in Southeastern SD, 2018

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Soybean seed treatment products are widely utilized by many farmers in southeastern South Dakota and the surrounding area. These products often consist of an insecticide/fungicide combination, and/or inoculant that is mixed and placed on the seed as a pre-treatment before the grower plants the crop. Many insecticide/fungicide combination seed treatment products are marketed and developed to protect seeds and seedling plants from insects and plant diseases that may damage the seed or suppress/kill the seedling. In addition, inoculant is designed to enhance soybean performance using rhizobia by adding beneficial bacteria to the soil. The effects of inoculant are often most prevalent in soybean crops that have not had soybean in the rotation for several years.

Although these products have become commonplace, understanding the positive effects of soybean seed treatments and inoculant is not commonly measured. Therefore, a study was developed near Baltic, SD to measure soybean stand and yield performance where various seed treatments were placed in an on-farm trial in a randomized complete block design.

Table 1. Materials and Methods

Item	Description
Location	Near Baltic, SD
Previous crop/tillage	Corn/Conventional tillage
Plot size	5' x 45'
Variety	Rob See Co RS2124-LL
Maturity Group	2.1
Seeding Rate	140,000 seeds/acre
Planting date	5/30/18
Treatments	Table 2
Harvest Date	10/23/18
Replications	3
Experimental design	Randomized Complete Block Design

Summary

With a wetter than average late spring/early summer in parts of southeastern SD, this plot was planted into suitable, but wet soils. The growing season turned more temperate and average rainfall allowed crops to mature as expected.

There were slight yield variances between treatments, but there was no statistically significant differences, meaning seed treatments did not significantly boost yields at this site (Table 2). There was however, observed significant yield differences between replications, which could be attributed to wet planting conditions and high moisture causing plant stress in low areas of the trial in early summer. Plant stand, test weight, and grain protein were also non-significant by treatment. There was a slight significance in grain oil percentage between treatments. This may be due to plant stress from

environmental conditions throughout pod fill, but it is difficult to pinpoint why this slight difference has been observed as field notes did not indicate any significant observed stresses.

Seed treatments did not significantly affect yield or plant stand in this trial. This treatment would cost approximately \$13/unit (140,000 seeds) if treated by the seed dealer- in this study site and year, seed treatment and inoculant was not economical for crop production.

Table 2. Stand and Yield of Soybean Seed Treatment Trial near Baltic, SD, 2018.

Treatment ¹	Treatment application rate oz/140,000 seeds	Plant Stand plants/ac	Test Weight lbs/bu	Grain Oil %	Grain Protein %	Yield @ 13% bu/ac
Control	0	116741	55.43	18.27	35.33	57.67
PPST 120 Inoculant ²	1.0	99898	54.13	18.20	35.07	57.07
Lumisena™ fungicide ³ + PPST 120 Inoculant	0.28+1.0	116741	54.57	18.43	34.97	54.87
Evergol fungicide ⁴ + PPST 120 Inoculant	0.50+1.0	110933	55.13	18.33	35.20	56.30
Gaicho 600 insecticide ⁵ + PPST 120 Inoculant	0.80+1.0	114418	54.93	18.23	35.07	57.07
PPST 2030 Biological ⁶ + PPST 120 Inoculant	1.0+1.0	108029	53.73	18.27	35.00	56.87
All Products ⁷	" "	110352	54.37	18.23	35.00	56.80
All Products except Lumisena fungicide	" "	120806	54.87	18.17	35.27	55.07
CV	--	7.40	1.22	0.53	0.50	2.36
Pr>F (0.10)	--	NS	NS	NS	0.0941	NS

¹Seed batch treated using small cement mixer.

²PPST 120+ inoculant plus extender product (rhizobia inoculant/extender) was developed for DuPont Pioneer

³Lumisena™ fungicide is a seed treatment owned by DuPont™

⁴EverGol™ fungicide is a seed treatment product marketed to 'promote root growth for faster crop establishment' by Bayer.

⁵Gaicho® 600 is a flowable insecticide seed treatment by Bayer.

⁶PPST 2030 Biological is a biological/polymer product by Pioneer Biological.

⁷Previously listed inoculant and seed treatment products were applied at full rate when combined or used individually.

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