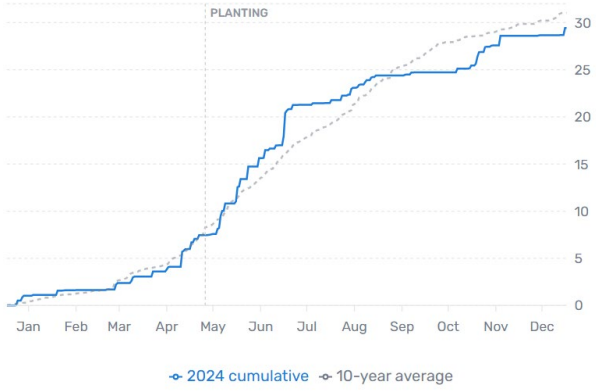
Comparing Standard Soybean Seed Treatment to a Biological Seed Treatment

Study ID: 1525159202401
County: Seward
Soil Type: Hastings silt loam 0-1% slope; Fillmore silt loam
Planting Date: 5/10/24
Harvest Date: 10/1/24
Seeding Rate: 155,000
Row Spacing (in): 10" twin rows on 30" centers for a 20" gap
Variety: Pioneer™ 25A16E
Reps: 4
Previous Crop: Corn
Tillage: No-Till into green planted rye
Herbicides: ***Early Post*** 20 oz/ac Roundup PowerMAX® 3, 4 oz/ac Anthem® MAXX, 1 qt/ac Enlist One®, 1 pt/ac Mn, 1 pt/ac Syntos, and 17#/100 gal AMS applied 5/28/24.
Post: 20 oz/ac Roundup PowerMAX® 3, 1 qt/ac Enlist One®, 8 oz/ac Clethodim, 1 pt Mn, 1 pt/ac Syntos, 3 pt/ac Warrant® and 17#/100 gal AMS on 6/5/24.
Foliar Insecticides: None
Foliar Fungicides: None
Fertilizer: None
Irrigation: Pivot, Total: 4.5"
Rainfall (in):



Introduction: Some producers are interested in alternative methods of protecting seeds from insects and disease beyond traditional insecticide/fungicide seed treatments. This can be due to cost, impacts to pollinators, soil microbes and the environment, or human safety. There's also interest in using seed treatments for disease suppression from white mold and sudden death syndrome. This study compared using a standard soybean seed treatment versus a biological seed treatment in a field with a history of white mold. The treatments were as follows:

Treatment 1: Full Company Seed Treatment
Treatment 2: Biological Seed Treatment *Blend of 2 oz PhycoTerra® ST, 1 oz Heads Up®, 1 oz N-Gage Ultra ST, 0.75 oz Bio ST VPH in 100 gal solution. In a second tank, 2 oz of Exceed Soybean Inoculant was used per 100 gal. Biological seed treatment was applied by the grower.*
Treatment 3: Inoculated *2 oz of Exceed Soybean Inoculant per 100 gal.*
Treatment 4: Untreated

Each treatment was seeded for a 20' width with a twin row planter on 10" spacings with seven replications. Rye had been planted after corn harvest in the field with the intention of using a roller crimper for better weed control. The rye was terminated by post-herbicide application on May 28 and then roller crimped on May 29 at a slight angle to the soybean rows. The rye provided excellent weed control. Some soybeans were damaged by the roller crimping as can be seen in the photos below.

Yield, grain moisture, test weight, and net return were evaluated. Stand counts were taken in each treatment following roller crimping, prior to the Soybean Management Field Day on 8/15/24, and prior to

harvest in the same area of each treatment and rep. Only harvest stand counts are shown. The grower also wanted to note that the organic matter in this field is 4.6% in 0-10".

Results:

Treatment	Harvest Stand Counts (9/23/24) (plants/acre)	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Full Seed Treatment	113,333 A	7.4 A	71 A	751 B
Biological Seed Treatment	105,000 A	7.4 A	6 A	753 AB
Inoculated Seed	106,000 A	7.5 A	70 A	773 A
Untreated Seed	99,000 A	7.4 A	70 A	771 AB
P-Value:	0.36	0.25	0.25	0.03

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $11/bu soybean, $27/ac for the standard seed treatment, $9/ac for the biological seed treatment, and $2/ac for the inoculant treatment.

Summary:

- There were no differences for harvest stand counts, moisture, or yield for any of the treatments.
- There was a difference between the marginal net return of the inoculated seed compared to the full company seed treatment.
- The results are consistent with what the grower found in three fields in 2023 (no yield difference between a full seed treatment and a biological seed treatment).

2024 Pics: Soybeans after roller crimping (top left); Pinched below cotyledon (top right and lower left); Early season stand counts after roller crimping (lower middle); Curve at base of some plants (lower right).





2023 Results:

Field 1: Planted: 5/2/23 **Harvested:** 9/28/23 **Seeding Rate:** 165,000 **Variety:** Pioneer® P23A40E
Row Spacing (in): 10" twin rows on 30" centers for a 20" gap **County:** Seward

Photos: (Top left) Tall and pollinating rye on May 19, 2023. (Top middle) Soybean with full traditional seed treatment with Ilevo with some halo effect. (Top right) Soybean with biological seed treatment. (Lower left) Early season stand counts. (Lower middle) Soybean with 2.5" from soil level to cotyledons. (Lower right) Harvesting lodged soybean with significant rye residue.

Results:

	Stand Counts (5/19/23)	Stand Counts (6/5/23)	Moisture (%)	Test Weight (lb/bu)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Standard Seed Treatment	92,000	132,000	10.2 A*	56 A	62 A	828 A
Biological Seed Treatment	94,000	138,000	10.2 A	56 A	61 A	830 A
P-Value	N/A	N/A	0.1996	0.766	0.102	0.845

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $13.76/bu soybean, $28/ac for the standard seed treatment, and $9.20/ac for the biological seed treatment.

Summary:

- It was difficult to take the early season stand counts in May due to the rye; therefore, counts may not be as accurate. Later irrigations resulted in additional soybean emergence leading to higher stand counts in June.
- There were no differences in moisture, test weight, yield, or net return between the two seed treatments.

Field 2: Planted: 5/10/23 **Harvested:** 10/23/23 **Seeding Rate:** 165,000 **Variety:** Pioneer® P30A75E
Row Spacing (in): 10" twin rows on 30" centers for a 20" gap **County:** York

Photos: (Top left) Rye on May 19 with soybean just beginning to emerge. (Top right) Biomass came on quickly as can be seen in this photo on June 5, with headed out rye biomass on the ground and soybean growing through it.

Results:

	Harvest Stand Count (plants/ac)	Moisture (%)	Test Weight (lb/bu)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Standard Seed Treatment	145,200 A*	9.7 A	56 A	65.7 B	876 B
Biological Seed Treatment	147,200 A	9.7 A	56 A	67.1 A	915 A
P-Value	0.854	0.763	0.165	0.002	<0.0001

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $13.76/bu soybean, $28/ac for the standard seed treatment, and $9.20/ac for the biological seed treatment.

Summary:

- There were no differences between the two treatments for harvest stand count, grain moisture, or test weight.
- Yield for the biological seed treatment was 1.4 bu/ac higher than the standard seed treatment.
- Marginal net return was $39/ac greater for the biological seed treatment compared to the standard seed treatment.

Field 3: Planted: 5/22/23 **Harvested:** 11/1/23 **Seeding Rate:** 200,000
Variety: Golden Harvest® GH3373E3
Row Spacing (in): 10” twin rows on 30” centers for a 20” gap **County:** Hamilton

	Harvest Stand Count (plants/ac)	Moisture (%)	Test Weight (lb/bu)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Standard Seed Treatment	147,625 A*	13.9 A	57 A	69 A	931 A
Biological Seed Treatment	146,375 A	13.8 A	57 A	68 A	931 A
P-Value	0.906	0.899	0.177	0.195	0.942

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $13.76/bu soybean, $16.63/ac for the standard seed treatment, and $9.20/ac for the biological seed treatment.

Summary: There were no differences in stand counts, test weight, moisture, yield, or net return between the seed treatments evaluated.