



## Soybean yield response to an R1 application of a biostimulant with and without foliar potassium.

Trial ID - 2017-006-PA – Pennsylvania State University

**Quick Details:** Fertileader products were applied at 1.5 and 2.5 pint/ac at R1 to evaluate effects on yield in soybeans, with and without foliar potassium (Corona K). Variety, seeding rates, and base fertilizers were otherwise applied equally across all treatments.

**Variety:** P31T77RR, 140,000/ac, planted on 5/11/2017

**Design:** Replicated plots, 6 per treatment. Plots were 10 ft x 50 ft with a 10' perimeter aisle

**Researcher(s):** Data compiled and submitted by Alyssa Collins, PhD, Pennsylvania State University. Final write-up by Jordan Martin, CCA and John D. Bailey, PhD, Timac Agro USA.

### OBJECTIVE

The following study was designed to evaluate the effects of a biostimulant with or without foliar potassium on soybean yield. The Fertileader range of products are liquid formulas that contain humic and fulvic acids, glycine betaine, isopentenyl adenosine (IPA), and amino-acid complexed nutrients. These patented formulas have been shown to improve crop response to water and heat stress, improve growth, chlorophyll content, photosynthetic rate, and enhance nutrient uptake. Corona K is a water-soluble fertilizer that is intended for foliar feeding of highly soluble potassium. Fertileader Gold has an analysis of 5.7% B + 0.35% Mo whereas Corona K has an analysis of 8-11-39 with 0.1% each of B, Cu, Fe, Mn, and Zn.

### MATERIALS AND METHODS

This study was conducted in a no-till field following a previous crop of corn on a Hagerstown silt loam. Pre-plant soil tests indicated optimum levels of potassium and phosphorous, and a soil pH of 6.8. Fertility and pest management recommendations were followed according to the Penn State Agronomy Guide 2017-2018. The experimental design was a randomized complete block with six replications. Plots were 10 ft wide by 50 ft long with a 10 ft perimeter aisle. The soybean variety was P31177RR planted at 140,000 seeds/ac on 11-May.

At R1 (19-July) the following foliar treatments were applied to soybean plots:

1. Untreated Control
2. Fertileader Gold – 1.5 pint/ac
3. Fertileader Gold – 2.5 pint/ac
4. Fertileader Gold – 1.5 pint/ac + Corona K (2 lb/ac)

Plots were then allowed to mature and harvested on 10-Oct. Total weight of grain from the center 2 rows of each replicate was used to calculate moisture, test weight, and yield.

### RESULTS

Moisture and test weights were not affected by any of the treatments and averaged 11.3% and 54.6 lb/bu, respectively. (data not shown).

**Untreated Controls had significantly lower yield ( $P < 0.05$ ) compared to soybeans treated with 1.5 pt/ac of Fertileader Gold (Treatment 2).** Increasing the rate of Fertileader Gold to 2.5 pt/ac (Treatment 3) or adding 2 lb/ac of a foliar potassium (Treatment 4) resulted in intermediate yields between Untreated Controls and Treatment 2.

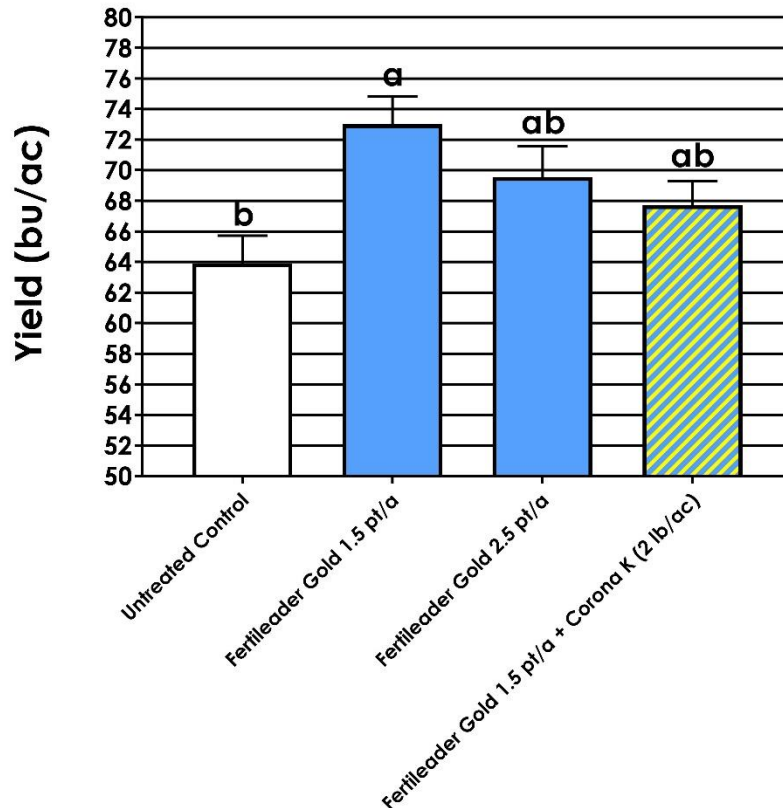
### CONCLUSIONS

**Overall, the use of Fertileader biostimulants improved yield in soybeans.** Based upon these findings, 1.5 pt/ac of Fertileader Gold showed statistically significant increases to yield and this effect was not enhanced by increasing the application rate to 2.5 pt/ac nor by adding a foliar source of potassium (Corona K). The lack of a response to foliar potassium was most likely related to the optimum levels of potassium in the soil. **Taken together, 1.5 pt/ac of Fertileader Gold resulted in the best ROI in soybeans under these study conditions (see Table 1).**

**Key Findings:**

**+9 bu/ac Fertileader Gold  
@ 1.5 pt/ac applied at R1**

**Effect of biostimulant and foliar potassium application at R1 on soybean yield.  
(Penn State U. - 2017)**



\*Means with different letters differ at  $P < 0.05$  (n=6 reps).

**Table 1. Return on investments**

	<u>Yield</u> (bu/ac)	<u>Gross Revenue</u> <u>@ \$9.50/bu</u>	<u>Change from</u> <u>Control</u>	<u>Rate of</u> <u>Fertileader</u> (pt/ac)	<u>Rate of Corona</u> (lb/ac)	<u>Add-on</u> <u>Costs</u>	<u>Net ROI</u>
Untreated Control	64	\$608.00	-	0	0	\$0.00	-
Fertileader Gold 1.5 pts/a	73	\$693.50	\$85.50	1.5	0	\$9.05	<b>\$76.45</b>
Fertileader Gold 2.5 pts/a	70	\$665.00	\$57.00	2.5	0	\$15.08	<b>\$41.92</b>
Fertileader Gold 1.5 pts/a + Corona K 2 lbs per acre	68	\$646.00	\$38.00	1.5	2	\$16.55	<b>\$21.45</b>