Bio Seed in Shelled Corn

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BIO SEED TREATMENTS INCREASE GRAIN CORN YIELD AND REVENUE IN NY

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A trial was established in Reality Research facilities, in Lyons, Upstate New York, in order to assess the effects of the nutrition enhancing and disease protection, seed treatment product Bio Seed (*Paenibacillus azotofixans, Bacillus megaterium, Bacillus mucilaginosus, Bacillus subtilis, Trichoderma harzianum,* each at 1x10^8 CFU/g, and *micorrizae,* at 1x10^2 IP/g), developed by Ag Biotech Inc., of Lakeville, NY (www.agbioinc.com), on Dyna Gro corn growth and grain yields, on gravely sandy loam soil.

Three treatments were laid down in different plots: Untreated Control (T1), "In Furrow" treatment (T2), and "Seed Treatment" (T3), the two latter at 50 grams of Bio Seed per acre, in a single application at planting, on May 22, 2017. The "In Furrow" treatment was sprayed with water in 15 gallons per acre volume.

The "Seed Treatment" was prepared with 788 grams of seed, treated with 1.37 grams of Bio Seed, dispersed in 6.51 grams or milliliters of water, done by Dr. Alan Taylor, Professor of Seed Science and Technology, Cornell University, Geneva, NY.

Grain corn weight and harvest yield evaluations took place on October 26. Each treatment had an area of 12 feet wide (4 rows at 3 feet spacing) and 100 feet length (8 inches between plants). Fertilization was 2 gallons/acre of N-Response and 1 gallon per acre of Kalibrate (side dressed at V5 stage).

The grain (shelled) corn weight (lb./plant) and harvested yield (bushels/acre) showed significant and marked 26% and 18% increases in the Bio Seed "In Furrow" and the "Seed Treatment" areas, respectively, as compared to the untreated Control (Table 1 and Figs. 1-2).

Table 1. Grain corn weight per plant and yield per acre in Bio Seed treatments and Control

Treatment	**Grain corn wgt. (lb./plant)**	**Grain corn yield (bu./acre)**
Untreated Control	0,423	165
In Furrow	0,532	207
Seed Treatment	0,498	194
% In Furrow increase	**26**	**26**
% Seed Treat. increase	**18**	**18**

Fig. 3 shows greater early growth (more fine roots and overall root system, which provide larger surface area of contact with the soil, as well as thicker stalks and more robust plants) in the Bio Seed treatments (center and right) compared to the untreated Control (left).

Fig. 1. Grain (shelled) corn weight (lb.) per plant

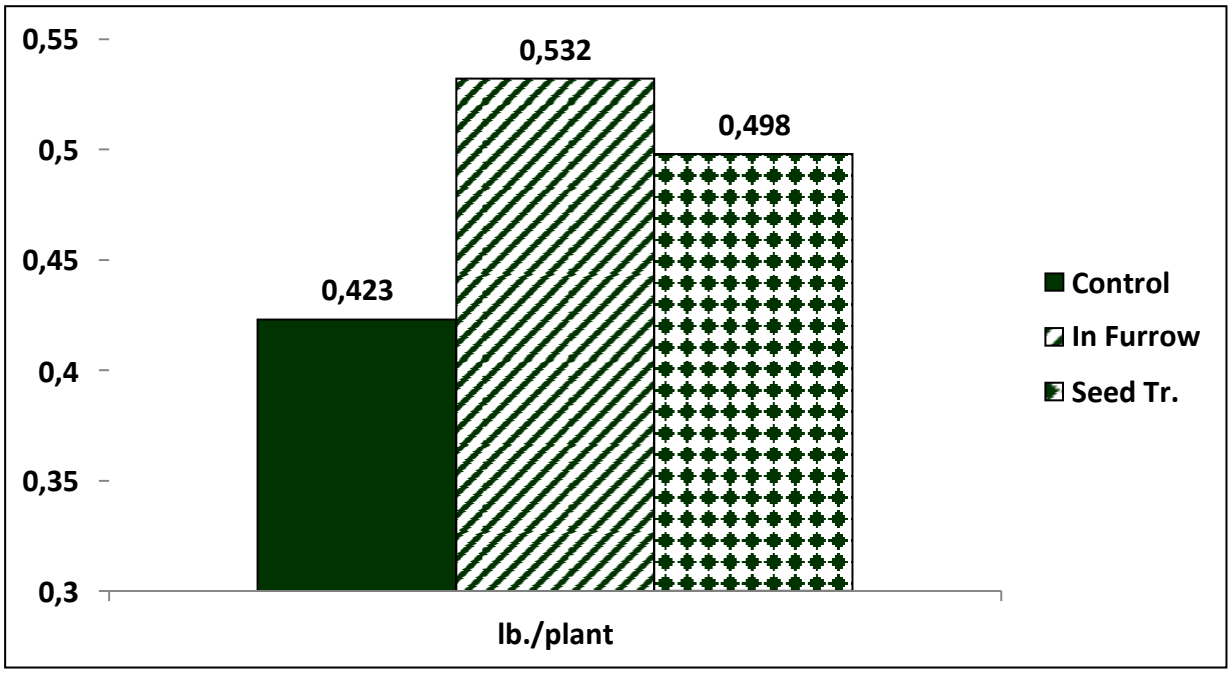
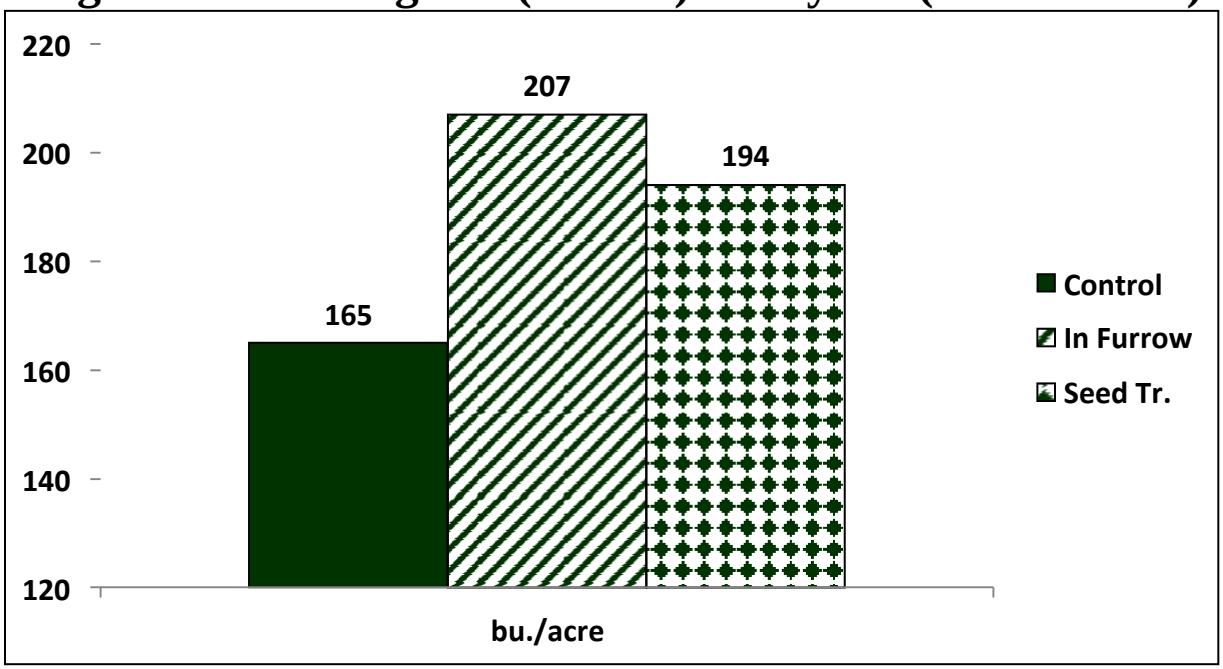


Fig. 2. Harvested grain (shelled) corn yield (bushels/acre)



The Economics analysis of the Bio Seed treatments in grain corn showed (highlighted in bold and larger letters) added income (above the untreated control) of $**148.40** and $**101.50** per acre, with net profits (subtracting the $10/acre of Bio Seed cost) of $**138.40** and $**91.50** per acre, and cost-benefit ratios of **14** and **9** to 1, with the Bio Seed "In Furrow" and "Seed Treatment" programs, respectively (Table 2).

Table 2. Economic analysis of in Bio Seed and control treatments in grain corn.

	Grain corn bu./acre	Income $/acre	Added grain yield bu./acre	Added income $/acre	Cost Bio Seed $/acre	Net Profits ($/acre)	Cost/ Benefit ratio
Control	164.5	575.75					
In Furrow	206.9	724.15	42.40	**148.40**	10.00	**138.40**	**14**
Seed Tr.	193.5	677.25	29.00	**101.50**	10.00	**91.50**	**9**

CONCLUSIONS

The nutrition enhancing and disease protection seed treatment product Bio Seed showed marked 26 & 18% increases in grain (shelled) corn weight per plant and yield per acre with In Furrow and Seed Treatment, respectively, as a result of larger and more robust root and plant growth.

As a result of the higher yields, the Bio Seed treatments showed $**138.40** and $**91.50** per acre net profit or revenues, and cost-benefit ratios of **14** and **9** to 1, with the "In Furrow" and "Seed Treatment" programs, respectively.

The "In Furrow" treatment showed better or higher values than the "Seed Treatment", and both showed better or higher values than the untreated control.

Fig. 3. Greater growth: more fine roots, which provide larger surface area of contact with the soil, and overall root system, as well as thicker stalks and more robust plants, in the Bio Seed treatments (center and right) compared to the Control (left).

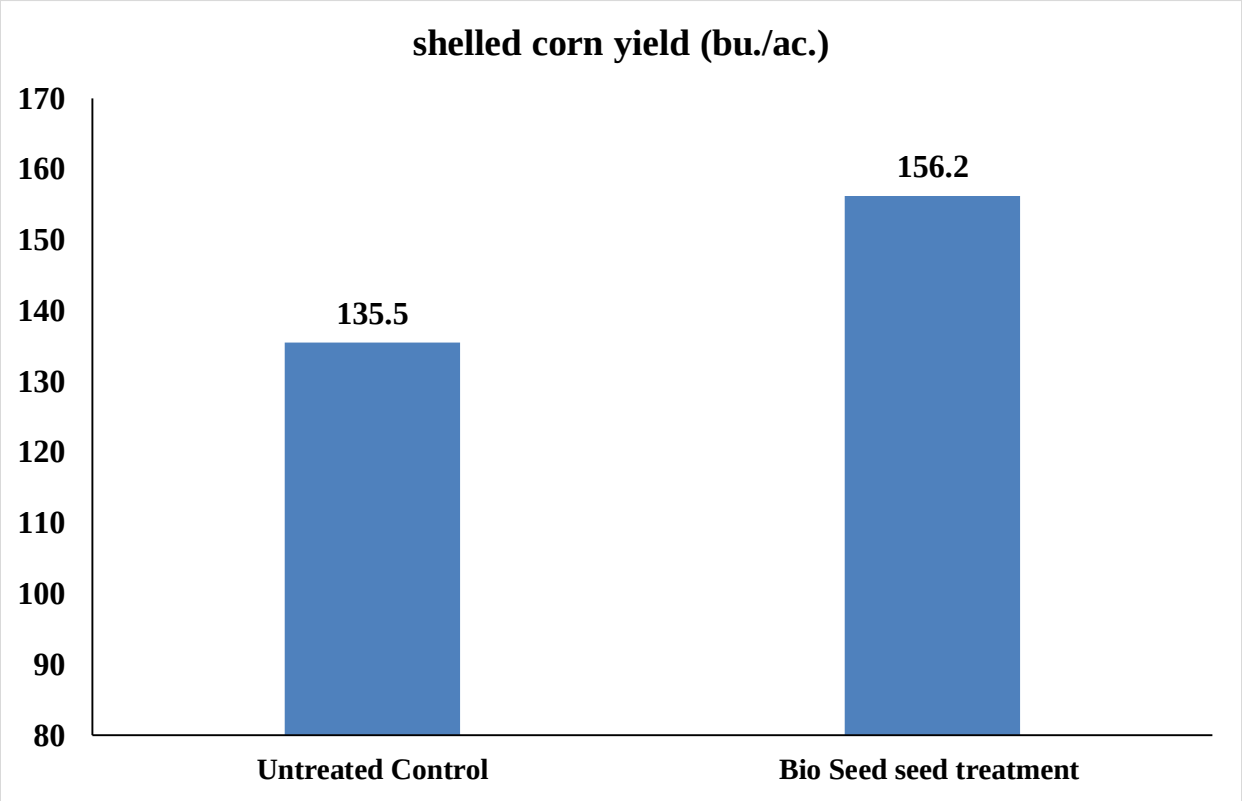
BIO SEED ON SHELLED CORN YIELD, MEMPHIS, TN, 2018

A small-plot replicated trial in DK 65-19 corn, conducted at Agricenter International in Memphis, TN, in 2018, by Dr. K. Bruce Kirksey, on a pH 6.4, good fertility and drainage Falaya clay loam soil, concluded the following:

- Bio Seed as a seed treatment, at 50 grams per acre, yielded significantly higher than the untreated control by 20.7 bu./ac. (15.3%), with $ 65/ac. additional net profits.

Programs	yield bu./ac.	incr.	% in-crease	added income	added costs	net profit
				US $/ac.		
Untreated Control	135.5 b	-	-	-	-	-
Bio Seed 50 g/ac. seed treatment	156.2 a	**20.7**	**15.3**	78	12.50	**65**
Standard error	4.11					

Means followed by a common letter do not differ significantly (LSD 0.05).



BIO SEED INOCULANT ON SHELLED CORN YIELD, TN 2019

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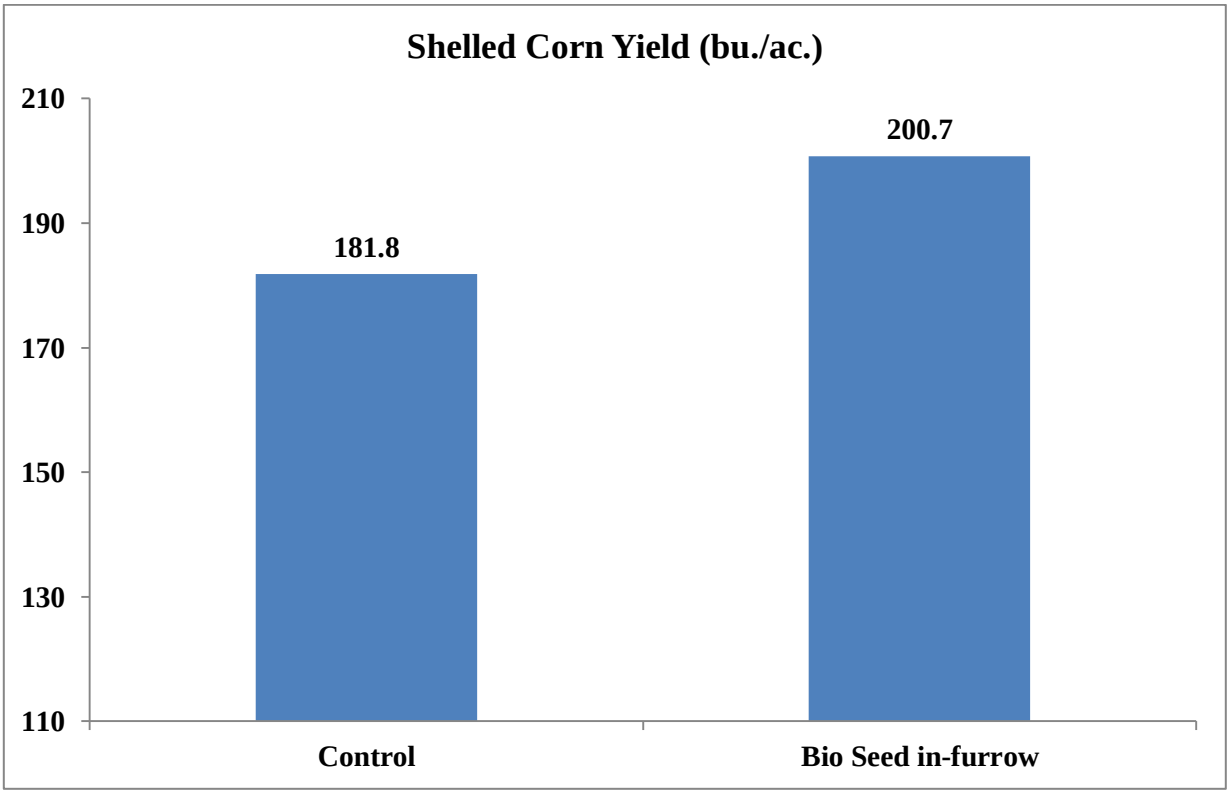
A 10x30 ft. plot, four replicated trial, was carried out in P1316YHR corn, planted on June 1 and harvested August 28, 2019, at Agricenter International in Memphis, TN, on a pH 6.4, 2.2% OM, good fertility and drainage, Falaya silt loam soil. The in-furrow treatment was done at planting, on June 1, 2019, with a rig sprayer at 5 gal./ac. spray volume.

Bio Seed alone at 50 g/ac., applied in-furrow at planting, yielded 18.9 bu./ac. or 10% higher than the untreated control, with $ 63.10/ac. net profits (table & figure).

Treatment	Appl. Rates	shelled yield bu/ac.	yield increase		Added income	Added costs	net profits
			bu./ac.	%	US $/ac.		
Control	-	181.8	-	-	-	-	-
Bio Seed in-furrow	50 g/ac.	200.7	**18.9**	**10**	75.60	12.50	**63.10**