

## BIO SHOT BIOSTIMULANT & NPK FERTILIZER REDUCTION ON SHELLED CORN YIELDS, TN 2022, WITH 2023 PRICES

Dr. K. Bruce Kirksey. Agricenter International. Memphis, TN. bkirksey@agricenter.org

A 10x30 ft. plot, four replicate, randomized plots trial, was carried out in DK60-88 corn, planted on June 15 and harvested on November 9, 2022, at Agricenter International, in Memphis, TN, on a good fertility and drainage, pH 6.5, 1.8% OM, Falaya Waverly silty loam soil. In-furrow Bio Shot biostimulant was applied first at planting “In-furrow” with spray rig at 25 PSI in 5 gal/ac water, and later as foliar spray, with CO<sub>2</sub>-pressured backpack, attached to two 8002 flat-fan nozzles per row, at 30 PSI, with 15 gal/ac. water, on July 15, 2020, at 30 days after planting (DAP). It was a drought year, so yields were low compared to normal. Data was analyzed by linear multiple regression.

Two formulations of Bio Shot were tested: Bio Shot (without other term), with 2000 ppm Triacantanol and 50 ppm Brassinosteroids, and newer Bio Shot Prime, with 3000 ppm Triacantanol and 60 ppm Brassinosteroids. All Bio Shot & Bio Shot Prime applications were at 40 ml/ac or 1.35 oz/ac

100% NPK included: 39 lb/ac N, 217 lb/ac P & 100 lb/ac K, equivalent to 85 lb/ac urea, 472 lb/ac DAP & 167 lb/ac potash. The Feb 2023 prices per ton were: urea \$666, DAP \$836, & potash \$673. Overall price of 100% NPK: \$ 248/ac., while 50% cost or saving was \$ 124/ac. Price of both Bio Shots: \$145 / liter.

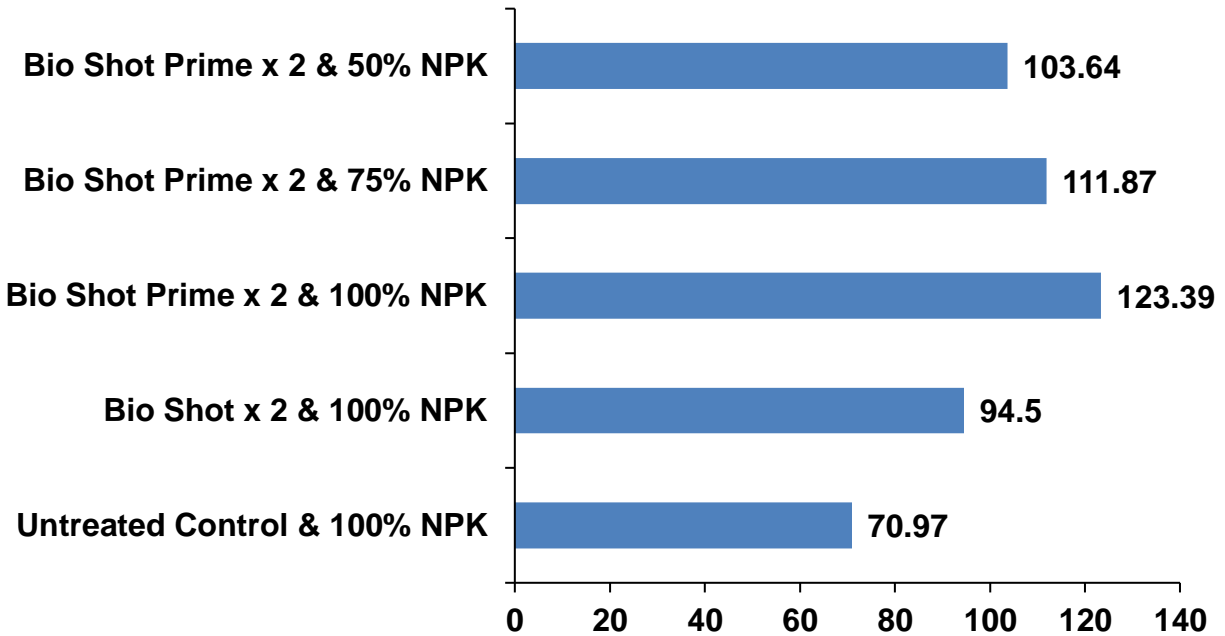
Two applications of Bio Shot Prime combined with 100%, 75% or 50% NPK fertilization showed very marked 74%, 58% and 46% yield increases, equivalent to 52.4, 40.9 and 32.7 bu/ac, respectively, above the Untreated Control with 100% NPK, as well as a small, but significant test weight increases (better quality) in all three, resulting in net added revenues or profits of \$ 332/ac, \$318/ac and \$326/ac, respectively, (Table & Figs.). However, although there was practically no difference in added net revenues or profits between Bio Shot Prime with 100% MPK and Bio Shot Prime with 50% NPN (only \$ 6 / ac in favor of the former), if other factors not taken into consideration in this economic analysis were considered, as fertilizer freight, storage and application, then the balance would tilt in favor of the latter: Bio Shot Prime with 50% NPN.

The above quoted highlights the feasibility of reducing fertilization by 50% when combined with Bio Shot Prime, thus achieving much higher yields (46% higher in present trial) and higher net revenues, as well as slightly but significantly better quality, than standard fertilization without Bio Shot (Control).

Finally, the lower a.i. formulation (not sold in USA) Bio Shot, in two applications, with no fertilizer reduction, showed marked 33% yield increase, equivalent to 23.5 bu/ac., as well as small but significant test weight increase (better quality), resulting in net profit of \$ 143/ac above the untreated Control.

Treatment	% NPK	test wgt. bu 56 lb.	Corn yield bu/ac	Corn yield increase		Added income	NPK saving	Add. cost	Net profits
				bu./ac	%				
Untreated Control	100	57.025 b	70.97 d	-	-	-	-	-	-
Bio Shot x 2	100	59.900 a	94.50 c	23.5	33	155.30		11.60	143
Bio Shot Prime x 2	100	58.410 ab	123.39 a	<b>52.4</b>	<b>74</b>	345.97		11.60	<b>332</b>
Bio Shot Prime x 2	75	59.008 a	111.87 ab	<b>40.9</b>	<b>58</b>	269.94	61.97	11.60	318
Bio Shot Prime x 2	50	58.213 b	103.64 bc	<b>32.7</b>	<b>46</b>	215.62	123.93	11.60	<b>326</b>
LSD (P=0.05)		1.406	12.14						

### Shelled corn yields, TN 2022 (bu/ac)



### Shelled corn added net revenues, TN 2022 (US\$/ac)

