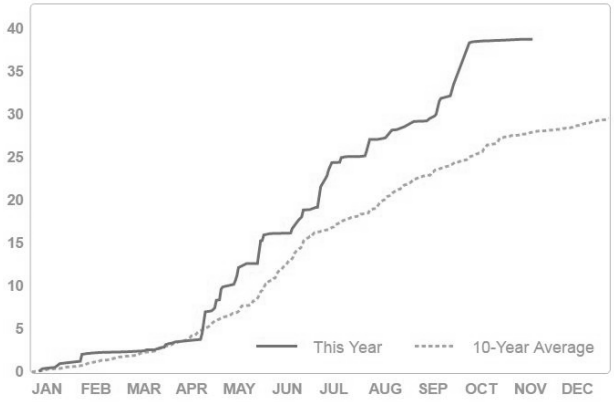
Ag Concepts® Enhance on Irrigated Soybeans

Study ID: 085141201601
County: Platte
Soil Type: Boel fine sandy loam occasionally flooded
Planting Date: 5/4/16
Harvest Date: 9/27/16
Population: 132,000
Row Spacing (in): 30
Hybrid: Asgrow 24-31
Reps: 4
Previous Crop: Corn
Tillage: Ridge-Till
Herbicides: ***Pre:*** Roundup®, Sharpen®, Enlite® ***Post:*** Roundup®, Select®
Seed Treatment: Acceleron®
Foliar Insecticides: ImidicLoprid
Foliar Fungicides: AxoyProp Extra

Fertilizer: 100 lb/ac Mesz® (12-40-0-10-1 Zn) and 75 lb/ac Potash; 7 gal/ac 8-20-3-6-0.4 as starter; 1 pt/ac Kugler MicroMax® sprayed on post. Note: SDS pressure in first replication.
Irrigation: Gravity, Total: ~8"
Rainfall (in):



Soil Sample:

ID	Soil pH	BpH	Soluble Salts 1:1 mmho/cm	Excess Lime Rating	% OM LOI	FIA ppm N	N (0-8 in) Lb/A	P ppm	Ammonium Acetate ppm K	Ca	Mg	Na	S ppm	DTPA ppm Zn	Fe	Mn	Cu	B ppm	Cl ppm	Sum of Cations (me/100 g)	% Base Saturation H	K	Ca	Mg	Na
North	6.4	6.9	0.16	NONE	1.0	9.6	23	24	193	870	84	11	8	4.8	23.3	5.6	0.56	0.08	8.2	6.5	14	8	66	11	1
South	6.5	6.9	0.23	NONE	1.3	15.7	38	38	332	1103	119	12	21	6.5	34.3	6.3	1.17	0.18	17.3	8.1	9	11	67	12	1

Introduction: Ag Concepts® Enhance is a foliar fertilizer product which includes humic acid (product information at right). The objective of this study was to evaluate Enhance uptake mechanisms through tissue and soil. To examine Enhance uptake, the product was applied as a pre-plant soil applied fertilizer sprayed on May 4, 2016 and foliarly on June 27, 2016 with post-herbicide application. For both applications, the rate was 64 oz Enhance with 35 gal/ac of water.

Plant tissue samples were taken at R2 on July 7, 2016. Petiole and trifolate samples of the uppermost fully expanded trifoliate were separated and tested *(Table 1)*. Yield was recorded using a yield monitor and weigh wagon *(Figure 1 and 2, Table 2)*.

Product information from:
http://www.kellysolutions.com/erenewals/documentsubmit/KellyData/ND%5CFertilizer%5CProduct%20Label%5CENHANCE_7_28_4_2_1_2013_5_22_45_PM.pdf

Guaranteed Analysis:

Total Nitrogen (N)……7.00%
6.67% Ammonical Nitrogen
0.33% Urea Nitrogen
Available Phosphate (P_2O_2)…… …28.00%
Soluble Potash (K_2O)……..4.00%
Copper (Cu)…… ……..0.05%
0.05% Chelated Copper
Iron (Fe)……..0.15%
0.05% Chelated Iron
Manganese (Mn)…… ……0.10%
0.10% Chelated Manganese
Zinc (Zn)…… ……..0.10%
0.10% Chelated Zinc

Derived From:
Ammonium PolyPhosphate; Phosphoric Acid; Mono Ammonium Phosphate; Mono Potassium Phosphate; Potassium Hydroxide; Potassium Tri Poly Phosphate; Tetra Potassium Pyro Phosphate; Iron from Hydroxyethylenediaminetriacetate (FeHEDTA); and Copper, Manganese, and Zinc from Ethylenediaminetetraacetate (EDTA).
Also Contains Non Plant Food Ingredients:
0.35% Humic Acids from Leonardite
0.275% Kelp from Ascophyllum Nodosum

Results:

Table 1. Trifoliate and petiole nutrient samples at R2 on July 7, 2016.

	Trifoliate				Petiole			
	Check	**Foliar Enhance**	**Pre-Plant Enhance**	**P-Value**	**Check**	**Foliar Enhance**	**Pre-Plant Enhance**	**P-Value**
N %	6.06 A*	5.69 A	5.86 A	0.5173	2.05 A	1.97 A	2.17 A	0.7067
P %	0.54 A	0.50 B	0.53 AB	0.0948	0.47 A	0.42 A	0.46 A	0.4669
K %	2.52 A	2.47 A	2.48 A	0.8237	5.87 A	5.53 A	5.75 A	0.1876
S %	0.33 A	0.32 A	0.33 A	0.9012	0.16 A	0.16 A	0.16 A	0.8091
Ca %	1.33 A	1.37 A	1.32 A	0.657	1.21 A	1.30 A	1.25 A	0.657
Mg %	0.42 A	0.42 A	0.40 A	0.0899	0.29 A	0.31 A	0.31 A	0.6055
Cl %	0.10 A	0.10 A	0.10 A	0.6699	0.06 A	0.06 A	0.06 A	0.7703
Zn ppm	63 A	52 A	58 A	0.3811	27 A	25 A	26 A	0.9016
Fe ppm	114 A	116 A	117 A	0.9539	58 A	67 A	65 A	0.4038
Mn ppm	95 A	94 A	91 A	0.6405	33 A	32 A	34 A	0.8801
Cu ppm	9.85 A	9.33 A	9.63 A	0.8367	7.1 A	7.3 A	6.9 A	0.9162
B ppm	39 A	39 A	38 A	0.1253	28 A	29 A	28 A	0.3983
Mo ppm	1.00 AB	0.80 B	1.20 A	0.0293	0.82 A	0.76 A	1.06 A	0.1097

*Values with the same letter are not significantly different at a 90% confidence level. Letters apply within row.

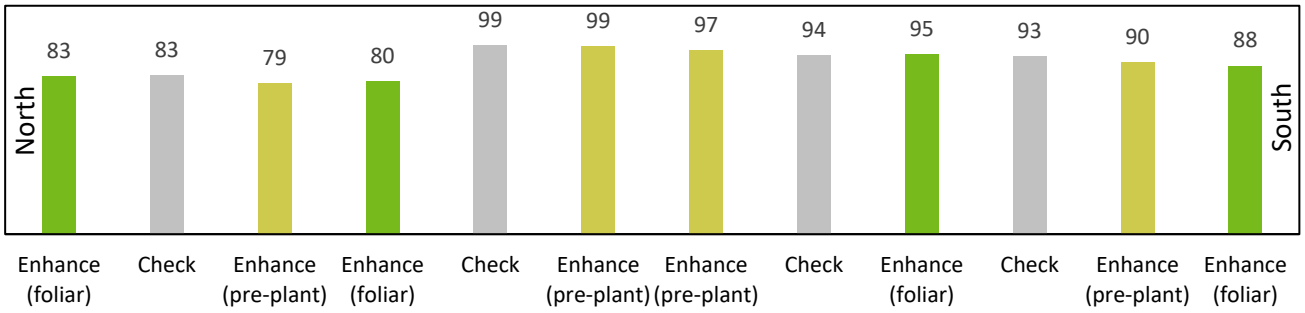


Figure 1. Yield average by treatment (bu/ac) from north to south.

Figure 2. Yield monitor data by treatment.

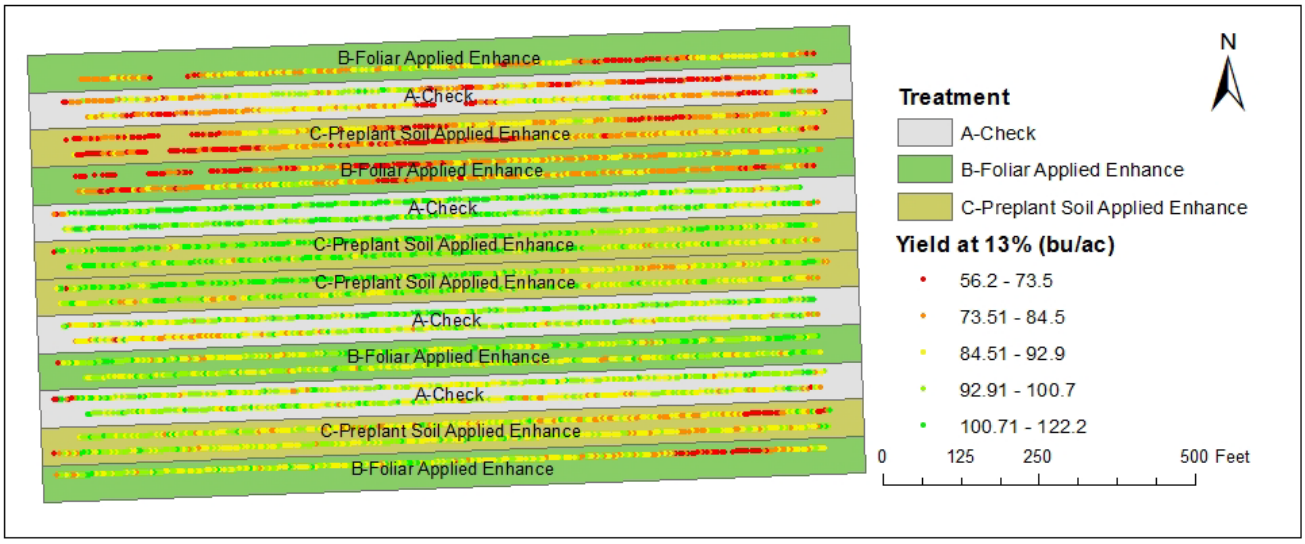


Table 2. Yield and moisture from yield monitor, harvest stand counts, and net return.

	Yield (bu/acre)†	Moisture (%)	Harvest Stand Count	Marginal Net Return‡ ($/ac)
Check	93 A*	11.3 A	106,000 A	$860.25
Foliar Enhance	87 A	11.2 A	106,250 A	$784.14
Pre-Plant Enhance	91 A	11.3 A	108,750 A	$821.14
P-Value	0.3386	0.724	0.5208	-

*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 $9.25/bu soybean price, $0.195/oz product cost, and $8.13 application cost.

Summary: Trifolate and petiole samples did not detect increased nutrient uptake when Enhance was applied as a pre-plant or foliar.

Yield was not increased by soil or foliar application of Enhance. Yield monitor data is reported here; weigh wagon data was also collected and produced the same conclusion. Sudden death syndrome (SDS) was present in the first replication. To evaluate the effect of SDS on treatments, the data were analyzed without the first replication. Results showed a higher yield for treatments but no statistical differences were found.

This study was sponsored in part by: Ag Concepts® Corp.