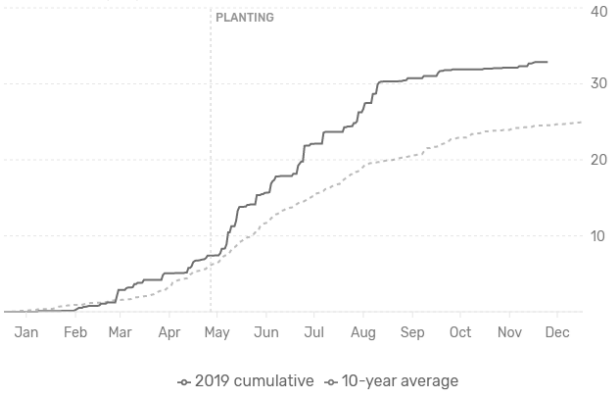
Impact of Nutrien Ag Solutions™ Extract on Nitrogen Use and Corn Yield

Study ID: 0805047201901
County: Dawson
Soil Type: Hall silt loam, 0-1% slope; Hord silt loam, 0-1% slope
Planting Date: 5/11/19
Harvest Date: 11/13/19
Seeding Rate: 32,000
Row Spacing (in): 30
Variety: Pioneer® P1093AMXT™
Reps: 9
Previous Crop: Corn
Tillage: Strip-Till
Herbicides: ***Pre:*** 32 oz/ac Durango®, 1.5 qt/ac FulTime®, 8 oz/ac Sterling Blue®, 0.75 lb/ac atrazine late May ***Post:*** 32 oz/ac Durango®, 1.5 qt/ac Resicore®, 0.5 lb/ac atrazine mid-June

Foliar Fungicides: 10 oz/ac Headline AMP® aerially applied approximately Aug 1
Irrigation: Pivot, Total: 5"
Rainfall (in):



Soil Test (Feb 2019):

Soil pH	Soluble Salts		Nitrate –	Nitrate	Mehlich	$CaPO_4$	Ammonium Acetate (ppm)				Sum of Cations	DPTA (ppm)			
1:1	1:1 mmho/cm	OM %	N ppm N	lb N/A	P-III ppm P	SO_4-S ppm	K	Ca	Mg	Na	me/100g	Zn	Fe	Mn	Cu
7.5	0.6	3.1	6	14	29	3	586	3200	288	29	20	1.6	14.9	9.0	0.7
7.4	0.3	2.9	9	22	112	6	665	3047	272	28	19	2.6	19.2	6.6	0.7
7.4	0.3	3.1	8	19	34	4	586	2764	243	29	17	2.3	11.8	6.4	0.6
7.4	0.3	3.0	9	22	37	4	662	3053	258	28	19	1.4	14.8	8.0	0.5

Introduction: Nutrien Ag Solutions™ Extract is a proprietary blend of the biocatalyst Accomplish® LM and ammonium thiosulfate (product information at right). The product claims to maximize nutrient release from crop residues and soil. The hypothesis was that Extract Powered by Accomplish™ would result in reduced fertilizer needs. To test this hypothesis, treatments were established with and without Extract and with a full and reduced fertilizer rate. Nutrien Ag Solutions™ Extract was applied at 1 gal/ac on April 9, 2019 to the Extract treatment strips.

Product information from:
https://s3-us-west-1.amazonaws.com/agrian-cg-fs1-production/pdfs/Extract_6-0-0_Label3.pdf

The whole field received 35 gal/ac of a 65:25:10 blend of 32% UAN, 10-34-0, and 12-0-0-26S (ammonium thiosulfate) on April 22, 2019 with an Orthman® strip-till implement. This resulted in a total of 93 lb N/ac, 35 lb P/ac, and 10 lb S/ac. An additional 5 gal/ac of 10-34-0 was applied at planting resulting in a total of 6 lb N/ac and 20 lb P/ac. The whole field also received fertigation at brown silk and early milk (approximately August 1 and 10) for a total of 20 gal/ac of 9:1 blend of UAN and 12-0-0-26S. This resulted in a total of 67 lb N/ac and 6 lb S/ac. Sidedress rates on June 14 were varied to establish the full and reduced fertilizer treatments. Sidedress was a 9:1 blend by volume of 32% UAN and 12-0-0-26S (ammonium thiosulfate). The full rate received 33 gal/ac of the blend, which resulted in 109 lb N/ac and 9.5 lb S/ac. The reduced rate received 19 gal/ac of the blend, which resulted in 70 lb N/ac and 5.5 lb S/ac. Sidedress was completed with

a coulter, injected 4-5" to the side of the row, at a depth of 2-3". In total, the full rate received 275 lb N/ac, 55 lb P/ac, and 25.5 lb S/ac while the reduced rate received 236 lb N/ac, 55 lb P/ac, and 21.5 lb S/ac.

This field had 8% green snap early July and 19% wind damage in the fall (no difference in damage across treatment strips).

Results:

	Total N (lb/ac)	Stand Count (plants/ac)	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
No Extract - Full fertilizer	275	34,407 A*	18.4 A	225 A	817.09 A
No Extract - Reduced fertilizer	236	34,296 A	18.4 A	221 AB	820.77 A
Extract - Full fertilizer	275	34,370 A	18.3 A	221 AB	777.35 B
Extract - Reduced fertilizer	236	34,037 A	18.2 A	217 B	784.09 B
P-Value	-	0.743	0.471	0.014	<0.0001

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre adjusted to 15.5% moisture.
‡Marginal net return based on $3.83/bu corn, $13.86/ac for Extract, $8/ac for Extract application, $26.49/ac for reduced fertilizer, and $46.01/ac for full fertilizer.

Summary:

- Stand counts and grain moisture did not differ between the treatments.
- The use of Extract did not result in a yield increase at the full or reduced fertilizer rates when compared to the no Extract treatments.
- For the no Extract treatments, the reduced fertilizer rate yielded as much as the full fertilizer treatment indicating that the lower fertilizer rate was sufficient.
- The use of Extract significantly reduced marginal net return due to the additional cost of the product and application and no yield increase.

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