

Manure and Sidedress Nitrogen Effect on Corn Yield

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Objective

To evaluate the effect of sidedress nitrogen and manure application on corn grain yield.

Background

Cooperator:	Bateson Farms	Soil test:	OM-4.5%, CEC-20,P-162 ppm, K-172, pH- 7.3
County:	Wood	Fertilizer:	7 gal 9-18-9 preplant 150 lb actual N sidedress
Nearest Town:	Rudolph	Planting Date:	April 28,2006
Drainage:	Tile, well-drained	Planting Rate:	28,000 seed/acre
Soil type:	Mermill, silty loam	Row Width:	30-inch
Tillage:	disk chisel	Herbicides:	Lumax
Previous Crop:	soybean	Harvest Date:	9-25-06

Methods

The entries were replicated 3 times in a randomized complete block design. Plot size was 40 x 500 feet each entry. On September 19, 2005 following the 2005 soybean harvest, liquid dairy manure was injected at an approximate rate of 7,000 gal/ac. Approximate nutrient content of manure according to laboratory analysis (total N -172 lb/ac, P₂O₅ – 64 lb/ac, K₂O – 150 lb/ac). Randomized strips with and without manure were applied. At corn planting, 7 gallon/acre of 9-18-9 was sprayed with herbicide. Sidedress application of 150 lb/ac actual liquid nitrogen was coulter injected on June 17, 2006. Sidedress nitrogen strips with and without nitrogen were applied to match the manure strips. Chlorophyll meter (SPAD 502) readings were taken during silking on July 24, 2006. Soil nitrate and ammonium samples were collected at 12 inch depth on dates below and analyzed by A & L labs, Fort Wayne, IN. Harvest data was collected from the entire 8 rows.

Results

Manure/ Nitrogen application	Corn Yield Bu/ac	Chlorophyll SPAD meter
0 Manure 0 Nitrogen	110.9 A	35.6 A
Manure 0 Nitrogen	136.9 B	52.6 BC
0 Manure Nitrogen	159.5 C	49.1 B
Manure Nitrogen	172.6 C	56.2 C
LSD (0.05)	13.2	4.3

Soil Nitrate NO3

Manure / Nitrogen application	5-23-06 NO3 ppm	6-16-06 NO3 ppm	7-13-06 NO3 ppm	9-6-06 NO3 ppm
0 Manure 0 Nitrogen	12	9	6 A	6
Manure 0 Nitrogen	16	11	14 A	6
0 Manure Nitrogen			64 B	6
Manure Nitrogen			79 B	10
LSD	NS	NS	22	NS

Soil Ammonium NH4

Manure / Nitrogen application	5-23-06 NH4 ppm	6-16-06 NH4 ppm	7-13-06 NH4 ppm	9-6-06 NH4 ppm
0 Manure 0 Nitrogen	2	12	4	6
Manure 0 Nitrogen	2	13	6	5
0 Manure Nitrogen			11	4
Manure Nitrogen			6	4
LSD	NS	NS	NS	NS

Summary

check	Nutrient applied	Corn yield increase	Value of nutrient applied (\$4.00 /bu)	Cost of 28% nitrogen (150 lb x \$0.30 / lb)
0 manure 0 nitrogen	manure	26.0 bu/ac	\$ 104.00	
0 manure nitrogen	manure	13.1 bu/ac	\$ 52.40	
Manure 0 nitrogen	28% nitrogen	35.7 bu/ac	\$ 142.80	\$45.00
0 manure 0 nitrogen	28% nitrogen	48.6 bu/ac	\$ 194.40	\$45.00
0 manure 0 nitrogen	manure + 28% N	61.7 bu/ac	\$ 246.80	\$45.00

Supplying nitrogen resulted in increased corn yield in this comparison. Application of sidedress N resulted in an increase in corn yield where manure had been applied. Manure significantly added 26 bu/ac of corn yield compared to 0 manure 0 N. Sidedress commercial nitrogen significantly added 48.6 bu/ac compared to 0 manure 0 N. Supplying both manure and commercial nitrogen together significantly added 61.7 bu/ac compared to 0 manure 0 N.

For additional information, contact:

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