

Manure and Sidedress Nitrogen Rate on Corn Yield

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Objective

To evaluate the effect of three nitrogen rates on yield of corn where manure was applied.

Background

Cooperator:	Paul Herringshaw	Soil test:	
County:	Wood	Fertilizer:	60 lb N starter
Nearest Town:	Weston	Planting Date:	April 28, 2004
Drainage:	Tile, well-drained	Planting Rate:	28,000 seed/acre
Soil type:	Hoytville, clay	Row Width:	30-inch
Tillage:	Minimum	Herbicides:	Fulltime, Princep
Previous Crop:	wheat	Harvest Date:	October 20, 2004
Variety:	Pioneer 34B23		

Methods

The entries were replicated 4 times in a randomized design. Plot size was 30 x 1500 feet for each entry. In September following the 2003 wheat harvest, liquid dairy manure was injected at an approximate rate of 7,000 gal/ac. At corn planting, 60 lbs/ac actual nitrogen was sprayed with herbicide. Sidedress application of 0, 50, and 105 lb/ac actual liquid nitrogen was coulters injected on June 8, 2004. Leaf tissue samples were collected at initial silking on July 15, 2004 and analyzed for N concentration. Chlorophyll meter (SPAD 502) readings were taken during silking on July 21, 2004. Stalk nitrate samples were collected at black layer on September 20, 2004. Harvest data was collected from the entire 12 rows.

Results

Sidedress Nitrogen rate	Corn Yield Bu/ac	Tissue test % nitrogen	Chlorophyll SPADD meter	Stalk nitrate ppm
0 lb/ac	177.3	3.34	60.5	1400
50 lb/ac	182.2	3.43	60.5	1475
105 lb/ac	181.1	3.61	62.6	3250
LSD (0.05)	NS	0.12	NS	NS

PSNT (pre sidedress soil nitrate test) soil samples were collected on June 3, 2004 with the following results (before sidedress N application) :

Nitrate NO₃-N - 24.1 ppm
Ammonium NH₄-N - 5.0 ppm

Summary

Application of sidedress N did not increase yield, chlorophyll readings, or stalk nitrate. While application of sidedress N at the high rate did increase tissue N concentration, all treatments had soil tissue N levels well within the sufficient range. Application of 7,000 gal/ac of liquid dairy manure in the fall was able to support maximum yield in this year without the need for sidedress N. For this particular location and year, a PSNT value of 24.1 ppm revealed that application of additional N would not result in increased yields. Additional research is needed to determine the N supplying ability of fall applied liquid dairy manure to the subsequent corn crop.

For additional information, contact:

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