

Comparison of Swine Manure and UAN as Nitrogen Sources at Side-dress for Corn Yield

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Objective

To compare corn yield response to nitrogen applied at side-dress as incorporated swine finishing manure and incorporated UAN 28%.

Background

Crop Year:	2013	Soil Test:	pH 6.3
Cooperator:	Kevin Schmitmeyer		P 70 ppm (140 lb/ac)
County:	Darke		K 164 ppm (328 lb/ac)
Nearest Town:	Versailles		Organic Mater 2.35%
Drainage:	Tile-50 feet spacing	Planting Date:	April 18, 2013
Soil Type:	Blount-Pewamo	Row Width:	30 inch
Tillage:	Conventional	Herbicide:	Surestart 1 qt/ac
Previous Crop:	Corn	Insecticide:	N/A
Variety:	Dekalb	Harvest Date:	October 14, 2013

Methods

A randomized block design with three treatments and four replications was used. Plots were 16 rows (40 feet) wide and 1,250 feet long. Liquid swine manure from a finishing building was applied via incorporation using a 6,200 gallon Jamesway tanker equipped with a Dietrich toolbar. The Dietrich toolbar incorporated the swine manure at a depth of five inches using shanks with eight inch sweeps. There was damage to the corn stand in the manure treatments due to operator application error. Portions of the rows were plowed out by the manure toolbar.

The swine manure and 28% UAN were applied on the same day while the corn was in the V2 stage. Field conditions were firm at the time of application.

The 28% UAN application rate was 180 units of nitrogen per acre. Swine manure replications received 5,000 or 9,000 gallons per acre. Manure samples indicated 42.4 pounds of available nitrogen per 1,000 gallons.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	42.4
Phosphorus as P ₂ O ₅	14.2
Potassium as K ₂ O	25.5

Weather conditions during the time of manure application were sunny with an ambient air temperature of 75 degrees. The plot received well above average rainfall for the growing season.

Table 1 Treatment Summary

Treatment	Description
Treatment 1 (T1)	50 gal/ac UAN 28%, 150#/ac of N
Treatment 2 (T2)	5,000 gal/ac incorporated liquid swine manure, 212#/ac of N
Treatment 3 (T3)	9,000 gal/ac incorporated liquid swine manure, 382#/ac of N

Results and Discussion**Table 2 Yield Summary**

Treatments	Yield (bu/ac)
28% UAN (T1)	235.3
Incorporated manure (T2)	225.8
Incorporated manure (T3)	233.7

LSD (0.05)

The results of this plot indicated no significant difference between the treatments (LSD (0.05) = 15.31, C.V=3.88). The incorporated manure yields were probably negatively impacted by stand reduction caused by operator error when the manure was applied.

The 28% UAN cost \$0.62 per pound or \$112 per acre plus the cost of application. The manure was available from the farmer's swine finisher building at no cost. The manure application cost, using the Minnesota Manure Distribution Cost Analyzer spreadsheet was calculated at \$20 per 1,000 gallons or \$.02 per gallon. The cost of applying 5,000 gallons per acre as side-dress nitrogen was \$100 per acre. The cost of applying 9,000 gallons per acre as side-dress nitrogen was \$180 per acre.

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