

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	Variety:	Pioneer 0210
Cooperator:	Dave Link	Soil Test:	pH 6.2
County:	Mercer		P 43 ppm (86 lb/ac)
Nearest Town:	Fort Recovery		K 133 ppm (266 lb/ac)
Drainage:	Tile-40 feet spacing		Organic Mater 2.4%
Soil Type:	Blount-Pewamo	Planting Date:	May 10, 2013
Tillage:	Conventional	Row Width:	30 inch
Previous Crop:	Soybeans	Harvest Date:	October 8, 2013

Methods

A randomized block design with two treatments and four replications was used. Plots were 12 rows (30 feet) wide and 2,150 feet long. Liquid swine manure from a nursery 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 five inch sweeps.

The swine manure and 28% UAN were applied on the same day while corn was in the V3 stage. Field conditions were firm at the time of application.

The 28% UAN application rate was 150 units of nitrogen per acre. All swine manure replications received 5,000 gallons per acre. Manure samples indicated 31.5 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 157 pounds of nitrogen, 61 lb/ac P₂O₅ and 155 lb/ac K₂O per acre.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	31.5
Phosphorus as P ₂ O ₅	12.2
Potassium as K ₂ O	30.9

Weather conditions during the time of manure application were sunny with an ambient air temperature of 71 degrees. The plot received slightly below 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, 157#/ac of N

Results and Discussion

Table 2 Yield Summary

Treatments	Yield (bu/ac)
28% UAN (T1)	152.1
Incorporated manure (T2)	151.5

LSD (0.05)

The results of this plot indicated no significant difference between the treatments (LSD (0.05) = 4.40, C.V=1.29).

The 28% UAN cost \$0.62 per pound of \$93 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.

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