

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

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Objectives

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

Background

Crop Year:	2012	Tillage:	No-till
Cooperator:	Jerry Klopfenstein	Soil Test	pH 6.2, P 31 ppm, K 132 ppm OM 2.4%
County/Town:	Paulding, Paulding	Planting Date:	April 20, 2012
Soil Type:	Paulding Clay	Row Width:	30 inch
Drainage:	Tile, systematic	Herbicide:	Stalwart 1.7 qts/acre
Previous Crop:	Soybeans	Harvest Date:	October 5, 2012
Corn Hybrid:	Pioneer 33W84		

Methods

A randomized block design with three treatments and four replications was used. Plots were 12 rows (30 feet) wide and 1,150 feet long. Liquid swine manure from a finishing building was applied via incorporation using a 5,250 gallon Balzer tanker equipped with a Peecon toolbar. The Peecon opens the soil with a narrow coulter to a depth of five inches and does not cover the manure furrow.

The swine manure and 28% UAN were applied on the same day while the corn was in the two leaf stage. Field conditions were dry 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 41.4 pounds of available nitrogen per 1,000 gallons. Available nitrogen is the ammonia portion of the nitrogen in the swine manure and approximately one-half of the organic portion. Swine manure treatments received 207 pounds of nitrogen, 50 lb./ac P₂O₅ and 204 lb./ac K₂O.

Table 1. Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	41.4
Phosphorus as P ₂ O ₅	9.9
Potassium as K ₂ O	40.8

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

Table 2. Treatment Summary

Treatment	Description
Treatment 1 (T1)	50 gal/ac UAN 28%, 150 #/a nitrogen
Treatment 2 (T2)	5,000 gal/ac incorporated liquid swine manure, 207 #/a nitrogen

Results and Discussion

Table 3. Yield Summary

Treatments	Yield (bu/ac)
28% UAN (T1)	110.7 ^a
Incorporated manure (T2)	118.8 ^b

LSD (0.05)

The results of this plot indicated a statistically significant difference between the treatments (LSD (0.05) = 3.37, C.V=1.30). The difference is likely due to the added moisture from the manure application as the plot was in extreme drought throughout the growing season.

The 28% UAN cost \$0.62 per pound or \$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 sidedress nitrogen was \$100 per acre.

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