

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

Glen Arnold, Ohio State University Extension-Field Specialist, Manure Nutrient Management Systems

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 6.2
Cooperator:	Mike Albers		P 165 ppm (340 lb/ac)
County:	Mercer		K 283 ppm (566 lb/ac)
Nearest Town:	Maria Stein		Organic Mater 3.9%
Drainage:	Tile-40 feet spacing	Planting Date:	May 12, 2013
Soil Type:	Blount-Pewamo	Row Width:	30 inch
Tillage:	Conventional	Herbicide:	Surestart 1 qt.ac
Previous Crop:	Soybeans	Insecticide:	N/A
Variety:	Pioneer 33W84	Harvest Date:	October 19, 2013

Methods

A randomized block design with two 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 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 the corn was in the V3 stage. Field conditions were firm at the time of application.

A plant stand count at the time of manure application revealed an inconsistent count of 24,350 plants per acre.

The 28% UAN application rate was 75 units of nitrogen per acre. All swine manure replications received 5,000 gallons per acre. Manure samples indicated 29.1 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 145 pounds of nitrogen, 53 lb./ac P₂O₅ and 140 lb./ac K₂O.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	29.1
Phosphorus as P ₂ O ₅	10.6
Potassium as K ₂ O	28.0

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

Table 1 Treatment Summary

Treatment	Description
Treatment 1 (T1)	25 gal/ac UAN 28%, 75#/ac of N
Treatment 2 (T2)	5,000 gal/ac incorporated liquid swine manure, 145#/ac of N

Results and Discussion

Table 2 Yield Summary

Treatments	Yield (bu/ac)
28% UAN (T1)	177.3
Incorporated manure (T2)	177.7

LSD (0.05)

The results of this plot indicated no significant difference between the treatments (LSD (0.05) = 4.53, C.V=1.13). The field has been heavily manured in past years and the mineralization of the organic matter may have helped offset the difference in the sidedress nitrogen application rates.

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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For more information, contact:

Glen Arnold

Field Specialist, Manure Nutrient Management Systems

Ohio State University Extension, Hancock County

7868 CR 140, Suite B

Findlay, Ohio 45840

419-422-3851

Arnold.2@osu.edu



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AND ENVIRONMENTAL SCIENCES