

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

Glen Arnold, Ohio State University Extension Educator, Putnam County
Sam Custer, OSU Extension Educator, Darke County

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 6.5 P 80 ppm (160 lb/ac) K 150 ppm (300 lb/ac)
Cooperator:	Todd Schmitmeyer	Organic Mater	2.5%
County:	Darke	Planting Date:	May 4, 2013
Nearest Town:	Versailles	Row Width:	30 inch
Drainage:	Tile-40 feet spacing	Herbicide:	Surestart 1 qt/ac
Soil type:	Blount-Pewamo	Insecticide:	N/A
Tillage:	Conventional	Harvest Date:	October 15, 2013
Previous Crop:	Soybeans		

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 28% UAN was applied using a standard incorporation toolbar. The farmer also applied a half rate (75 pounds per acre of N) to the swine manure treatments.

The swine manure and 28% UAN were applied two days apart while the 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 58.4 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 292 total pounds of nitrogen, 104 lb./ac P₂O₅ and 201 lb./ac K₂O.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	58.4
Phosphorus as P ₂ O ₅	20.8
Potassium as K ₂ O	40.2

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)	57 gal/ac UAN 28%, 171#/ac of N
Treatment 2 (T2)	5,000 gal/ac incorporated swine manure 292#/ac of N

Results and Discussion

Table 2 Yield Summary

Treatments	Yield (bu/ac)
28% UAN (T1)	200.5
Incorporated manure (T2)	202.2

LSD (0.05)

The results of this plot indicated no significant difference between the treatments (LSD (0.05) = 33.00, C.V=7.43).

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 side-dress nitrogen was \$100 per acre.

Acknowledgement

The authors would like to thank McClure Farms for the use of manure application equipment and Todd Schmitmeyer for his swine manure and corn field.

The authors would also like to thank the Ohio Pork Producers and Ag Credit for their financial support of this research.

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



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES