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

Glen Arnold, Ohio State University Extension Educator, Agriculture
Amanda Meddles, Extension Program Coordinator, Environmental Management
Albert Maag, Putnam County Soil and Water Conservation District

Objectives:

1. To compare corn yield response to nitrogen applied at side-dress as swine manure and UAN 28%.
2. To compare corn yield response to manure and 28% UAN with and without a microbial soil amendment nitrogen inhibitor.

Background

Crop Year:	2010	Variety:	Pioneer 32T85
County:	Putnam	Soil Test:	pH 6.4, P 48 ppm, K 163 ppm,
County/Town:	Leipsic, OH		OM 2.2%
Soil Type:	Del-Rey Fulton Silt Loam	Planting Date:	April 23, 2010
Drainage:	Tile-40 ft spacing	Row Width:	30 inch
Previous Crop:	Soybeans	Herbicide:	Cinch
Tillage:	Conservation tillage	Harvest Date:	October 10, 2010

Methods

A randomized block design with four treatments and four replications was used. Plots were 16 rows (40 feet) wide and 620 feet long. Liquid swine manure from a finishing building was applied via incorporation using a 4,500 gallon Nuhn tanker equipped with a four row Dietrich injection toolbar.

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 pounds of nitrogen per acre or 50 gal/ac. The swine manure application rate was 4,200 gal/ac or 169 units of nitrogen per acre. Accomplish was added to the 28%UAN at a rate of two quarts per acre and to the manure at a rate of 6 quarts per acre. Accomplish is a microbial soil amendment nitrogen inhibitor. Manure samples indicated 40.3 pounds of available nitrogen per 1,000 gallons. In addition to the nitrogen, the swine manure reps also received 48.6 lbs/ac P_2O_5 and 131.9 lbs/ac K_2O.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1st year)	40.3
Phosphorus as P2O5	22.1
Potassium as K2O	31.4

Weather conditions during the time of manure application were sunny and 77 degrees. The plot received above average rainfall for the first half of the growing season and very little rainfall during the second half of the growing season.

Table 1Treatment Summary

Treatment	Description
Treatment 1 (T1)	50 gal/ac UAN 28%
Treatment 2 (T2)	50 gal/ac UAN 28% + 2 qt/ac of Accomplish
Treatment 3 (T3)	4,200 gal/ac of liquid swine finishing manure
Treatment 4 (T4)	4,200 gal/ac of liquid swine finishing manure + 6 qt/ac Accomplish

Results and Discussion

Table 2 Yield Summary

	Yield (bu/ac)
Average of four 28% UAN reps (T1)	180.0 a
Average of four 28% UAN + Accomplish reps (T2)	182.8 a
Average of four incorporated manure reps (T3)	179.2 a
Average of four incorporated manure + Accomplish reps (T4)	184.1 a

The results of this plot indicate no statistical difference for yield between any of the treatments (LSD (0.05) = 13.55). Swine manure was a satisfactory source of side-dress nitrogen for this research plot. The 28% UAN cost $0.68 per pound or $102.00 per acre. The manure was available from the farmer's swine finisher building at no cost. Application costs for the manure would vary depending on the farm's equipment and labor costs.

Acknowledgments:

The authors would like to thank Larry and George Bonifas for the use of their manure application equipment. The authors would also like to thank Dennis. Kenny and Jerry Niese for the use of their field and swine manure. 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
OSU Extension Putnam County
124 Putnam Parkway
Ottawa, OH 45875
arnold.2@osu.edu

THE OHIO STATE UNIVERSITY EXTENSION