

Swine Finishing Manure as a Top-Dress Nitrogen Source on Wheat

Glen Arnold, Ohio State University Extension Educator, Putnam County
Jon Rausch, Program Director, Animal Manure Management
Albert Maag, Putnam County Soil and Water Conservation District

Objectives:

- To compare wheat yield response to nitrogen applied at top-dress as swine manure and UREA.
- To compare wheat yield response to surface applied swine manure and incorporated swine manure.
- To compare wheat yield response to surface applied manure, using a dragline, to surface applied manure using a tanker.

Background

Crop Year:	2008	Soil test:	pH 6.4, P 38 ppm, K 123 ppm, OM 2.35%
Cooperator:	Dennis Niese	Planting Date:	October 20, 2007
County:	Putnam	Row Width:	7.5 in.
Nearest Town:	Leipsic	Herbicides:	n/a
Drainage:	Tile-40 ft spacing	Insecticide:	n/a
Soil type:	Del Ray-Fulton clay loam	Harvest Date:	July 13, 2008
Tillage:	Conversation tillage	PSNT test:	n/a
Previous Crop:	Soybeans		
Variety:	Hopewell		

Methods

A randomized block design with four treatments and four replications was used. Manure plots were 39 feet wide and UREA plots were 40 feet wide. All plots were 1020 feet in length. The center 30 feet of each replication was harvested. Liquid swine manure from a finishing building was applied via surface application and incorporation using a 3,000 gallon tanker equipped with a modified Pecan toolbar 13 feet in width. Manure was also surface applied with a dragline utilizing a six inch hose. UREA was applied using a standard fertilizer buggy.

The UREA application rate was 100 pounds of nitrogen per acre. The liquid swine manure application rate was 4,200 gallons per acre. Manure sample results indicated 40 pounds of available nitrogen per 1,000 gallons of swine finishing manure. Swine manure treatments received 168 pounds of nitrogen, 102 lb/ac P₂O₅ and 147 lb/ac K₂O.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	39.98
Phosphorus as P ₂ O ₅	24.26
Potassium as K ₂ O	35.04

Weather conditions during the time of manure application were sunny and 75 degrees. Because of the wet spring, the wheat was approximately five inches tall (Feekes growth stage 4) at the time the treatments were applied on April 18th. Substantial amounts of wheat were flattened, especially by the manure tanker. The plot received above average rainfall for the 2008 growing season. Field conditions were firm during application.

Treatment Summary	Description
Treatment 1 (T1)	UREA 100 units per acre
Treatment 2 (T2)	4200 gal/ac surface applied swine finishing manure
Treatment 3 (T3)	4,200 gal/ac incorporated swine finishing manure
Treatment 4 (T4)	4,200 gal/ac swine finishing manure surface applied via dragline

Results and Discussion

Yield Summary

Treatments	Yield (bu/ac)
Average of four UREA reps (T1)	62.9 a
Average of four surface applied swine finishing manure reps (T2)	63.1 a
Average of four incorporated swine finishing manure reps (T3)	61.4 a
Average of four swine finishing manure surface applied dragline reps (T4)	62.1 a
	LSD (0.05) NS

The results of this plot indicate no statistical difference for yield between treatments. Swine manure appears to be a satisfactory source of top-dress nitrogen for wheat.

The UREA cost was \$0.75 per pound so the UREA treatments had \$75.00 dollars per acre of purchased fertilizer plus the cost of application. The manure was available from the farmer's swine finisher building at no cost. Cost to custom apply the dragline manure was \$0.008/gal or \$33.60 per acre (\$0.008/gal x 4,200 gal/ac). Application costs for the manure would vary depending on the farm's equipment and labor costs.

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For more information, contact:
 Glen Arnold
 OSU Extension, Putnam County
 124 Putnam Parkway
 Ottawa, OH 45875
 419-523-6294
 arnold.2@osu.edu

