

Comparison of Swine Manure to UAN as a Spring Top-Dress Nitrogen Source on Wheat Yield

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Objective

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

Background

Crop Year:	2014	Soil test:	pH 6.2 P 25 ppm (50 lb/ac) K 82 ppm (164 lb/ac)
Cooperator:	Jason Kalb	Organic Mater	2.6%
County:	Seneca	Planting Date:	October 10, 2013
Nearest Town:	New Washington	Row Width:	7 inch
Drainage:	Tile-40 feet spacing	Herbicide:	N/A
Soil type:	Tiro silt loam	Insecticide:	N/A
Tillage:	No-till	Harvest Date:	July 8, 2014
Previous Crop:	Soybeans		

Methods

A randomized block design with two treatments and three replications was used. Plots were 40 feet wide and 1,150 feet long. Liquid swine manure from a finishing building was applied via a 6,000 gallon manure tanker and incorporated using a Grassland Applicator toolbar. The Grassland Applicator toolbar has straight coulters spaced 7 inches apart with a manure boot behind each coulters. The toolbar sliced open the soil to a depth of 5 inches and manure flowed into the soil openings. The manure application rate was 3,600 gallons per acre.

The manure and 28% UAN were applied on the same day the first week of April at Feeks growth stage five. Field conditions were firm at the time of application. There was some damage to the wheat stand from the manure application toolbar.

The 28% UAN application rate was 105 units of nitrogen per acre. Manure samples indicated 30.8 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 111 lb/ac of nitrogen, 30 lb/ac P₂O₅ and 76 lb/ac K₂O.

Table 1. Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	30.8
Phosphorus as P ₂ O ₅	8.5
Potassium as K ₂ O	21.2

Weather conditions during the time of manure application were sunny with an ambient air temperature of 72 degrees. The plot received below average temperatures and slightly above average rainfall for the growing season.

Table 2. Treatment Summary

Treatment	Description
Treatment 1 (T1)	35 gal/ac surface applied 28% UAN 105#/ac of N
Treatment 2 (T2)	3,600 gal/ac incorporated liquid swine manure, 111#/ac of N

Results and Discussion

Table 3. Yield Summary

Treatments	Yield (bu/ac)
28% UAN (T1)	93.8
Incorporated manure (T2)	98.7

LSD (0.05)

The results of this plot indicated no statistically significant difference between the treatments (LSD (0.05) = 11.22, C.V=3.32). The manure treatments received slightly higher nitrogen amounts than the commercial fertilizer treatments.

The 28% UAN cost \$0.54 per pound or \$56.70 per acre plus the cost of application. Based on the OSU Extension 2014 Ohio Farm Custom Rate Survey, the cost of applying the 28%UAN is approximately \$7.15 per acre.

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 3,600 gallons per acre as top-dress nitrogen was \$72 per acre.

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