

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

Glen Arnold, Ohio State University Extension Educator, Putnam County
Albert Maag, Putnam County Soil and Water Conservation District

Objective

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

Background

| | | | |
|----------------|----------------------|----------------|--------------------------------------|
| Crop Year: | 2011 | Tillage: | No-till |
| Location: | Glandorf, OH | Soil Test | pH 6.3, P 75 ppm, K 210 ppm, OM 2.6% |
| County: | Putnam | Planting Date: | June 5, 2011 |
| Soil Type: | Paulding Clay | Row width: | 30 inch |
| Drainage: | Tile – 40 ft spacing | Harvest Date: | October 30, 2011 |
| Previous Crop: | Soybeans | | |
| Hybrid: | Pioneer 33 W84 | | |

Methods

A randomized block design with three treatments and four replications was used. Plots were 12 rows (30 feet) wide and 1,180 feet long. Liquid swine manure from a finishing building was applied via incorporation using a 5,250 gallon Balzer tanker equipped with a Dietrich toolbar. There was damage to the corn stand due to operator error but stand counts were not taken. The surface manure treatments were also applied in the same fashion as the incorporated treatments except the toolbar was raised.

The swine manure and 28% UAN were applied on the same day while the corn was in the two leaf 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 28.4 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 142 pounds of nitrogen, 50 lb./ac P₂O₅ and 100 lb./ac K₂O.

Table 1 Swine Finishing Manure Analysis

| Nutrient | lbs. per 1,000 Gallons |
|---|------------------------|
| Nitrogen (available the 1 st year) | 28.4 |
| Phosphorus as P ₂ O ₅ | 10.1 |
| Potassium as K ₂ O | 20.0 |

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

Table 2 Treatment Summary

| Treatment | Description |
|------------------|--|
| Treatment 1 (T1) | 50 gal/ac UAN 28% |
| Treatment 2 (T2) | 5,000 gal/ac surface applied liquid swine manure |
| Treatment 3 (T3) | 5,000 gal/ac incorporated liquid swine manure |

Results

Table 3 Yield Summary

| Treatments | Yield (bu/ac) |
|---|--------------------|
| Average of four 28% UAN reps (T1) | 177.8 _a |
| Average of four surface manure reps (T2) | 162.5 _b |
| Average of four incorporated manure reps (T3) | 167.8 _b |

The results of this plot indicated statistically significant differences between the treatments (LSD (0.05) = 8.30). The commercial fertilizer treatment was statistically higher than either of the manure treatments.

Summary

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
Ohio State University Extension, Putnam County
124 Putnam Parkway
Ottawa, OH 45875
arnold.2@osu.edu

