

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

Glen Arnold, Ohio State University Extension Educator, Putnam County

## Objectives

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

## Background

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|                |                  |                |                             |
|----------------|------------------|----------------|-----------------------------|
| Crop Year:     | 2012             | Tillage:       | No-till                     |
| Cooperator:    | Jeff Duling      | Soil Test      | pH 6.2, P 81 ppm, K 232 ppm |
| County/Town:   | Putnam, Glandorf |                | OM 2.7%                     |
| Soil Type:     | Paulding Clay    | Planting Date: | April 18, 2012              |
| Drainage:      | Tile, systematic | Row Width:     | 30 inch                     |
| Previous Crop: | Soybeans         | Herbicide:     | FulTime NXT 3 qts/acre      |
| Corn Hybrid:   | Pioneer 33W84    | Harvest Date:  | October 18, 2012            |

## Methods

A randomized block design with two treatments and four replications was used. Plots were 16 rows (40 feet) wide and 1,100 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. The Dietrich toolbar incorporated the swine manure at a depth of five inches using shanks with eight inch sweeps. There was damage to the corn stand in the manure treatments due to operator application error. Portions of the rows were plowed out by the manure toolbar.

The swine manure and 28% UAN were applied on the same day while the corn was in the V2 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 6,000 gallons per acre. Manure samples indicated 28.4 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 170 pounds of nitrogen, 61 lb./ac P<sub>2</sub>O<sub>5</sub> and 120 lb./ac K<sub>2</sub>O.

**Table 1. Swine Finishing Manure Analysis**

| Nutrient                                      | lbs. per 1,000 Gallons |
|---|------------------------|
| Nitrogen (available the 1 <sup>st</sup> year) | 28.4                   |
| Phosphorus as P <sub>2</sub> O <sub>5</sub>   | 10.1                   |
| Potassium as K <sub>2</sub> 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 below average rainfall for the growing season.

**Table 2. Treatment Summary**

| Treatment        | Description   |
|------------------|---|
| Treatment 1 (T1) | 50 gal/ac UAN 28%, 150#/ac of N                             |
| Treatment 2 (T2) | 6,000 gal/ac incorporated liquid swine manure, 170#/ac of N |

## Results and Discussion

**Table 3. Yield Summary**

| Treatments               | Yield<br>(bu/ac) |
|--------------------------|------------------|
| 28% UAN (T1)             | 154.9            |
| Incorporated manure (T2) | 151.7            |

LSD (0.05)

The results of this plot indicated no statistically significant difference between the treatments (LSD (0.05) = 10.93, C.V=3.17). The incorporated manure yields were probably negatively impacted by stand reduction caused by operator error when the manure was applied.

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 6,000 gallons per acre as sidedress nitrogen was \$120 per acre.

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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



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AND ENVIRONMENTAL SCIENCES