

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

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Objective

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

Background

| | | | |
|----------------|----------------------|----------------|-----------------------|
| Crop Year: | 2014 | Variety: | Pioneer 0212 |
| Cooperator: | Floyd Bergman | Soil Test: | pH 6.9 |
| County: | Mercer | | P 154 ppm (308 lb/ac) |
| Nearest Town: | Fort Recovery | | K 133 ppm (266 lb/ac) |
| Drainage: | Tile-40 feet spacing | | Organic Mater 3.3% |
| Soil Type: | Blount-Pewamo | Planting Date: | May 10, 2014 |
| Tillage: | Conventional | Row Width: | 30 inch |
| Previous Crop: | Soybeans | Harvest Date: | October 18, 2014 |

Methods

A randomized block design with two treatments and four replications was used. Plots were 12 rows (30 feet) wide and 1475 feet long. Liquid swine manure from a finisher building was applied via incorporation using a 6,200 gallon Jamesway tanker equipped with a Dietrich toolbar. The Dietrich toolbar incorporated the swine manure at a depth of five inches using shanks with five inch sweeps.

The swine manure and 28% UAN were applied on the same day while corn was in the V2 stage. Field conditions were firm at the time of application.

The 28% UAN application rate was 105 units of nitrogen per acre. All swine manure replications received 3,400 gallons per acre. Manure samples indicated 41.5 pounds of available nitrogen per 1,000 gallons. Swine manure treatments received 141.1 lb./ac of nitrogen, 195.2 lb/ac P₂O₅ and 165.6 lb/ac K₂O.

Table1. Swine Finishing Manure Analysis

| Nutrient | lbs. per 1,000 Gallons |
|---|------------------------|
| Nitrogen (available the 1 st year) | 41.5 |
| Phosphorus as P ₂ O ₅ | 57.4 |
| Potassium as K ₂ O | 48.7 |

Weather conditions during the time of manure application were sunny with an ambient air temperature of 77 degrees. The plot received above average rainfall for the growing season.

Table 2. Treatment Summary

| Treatment | Description |
|------------------|---|
| Treatment 1 (T1) | 35 gal/ac UAN 28%, 105#/ac of N |
| Treatment 2 (T2) | 3,400 gal/ac incorporated liquid swine manure, 141#/ac of N |

Results and Discussion

Table 3. Yield Summary

| Treatments | Yield (bu/ac) |
|--------------------------|----------------------|
| 28% UAN (T1) | 198.5 _a |
| Incorporated manure (T2) | 198.8 _a |

LSD (0.05)

The results of this plot indicated no significant difference between the treatments (LSD (0.05) = 11.95, C.V=2.53). The regular rainfall throughout the growing season probably resulted in mineralization of soil organic matter and the ongoing release of nitrogen to the corn crop. Soils this high in phosphorus should not use manure as a nitrogen sidedress.

The 28% UAN cost \$0.52 per pound or \$54.60 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 \$9.50 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 3,400 gallons per acre as side-dress nitrogen was \$68 per acre.

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