

# Comparison of Swine Manure and 28% 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 28% UAN.

## Background

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|                |                      |                |                       |
|----------------|----------------------|----------------|-----------------------|
| Crop Year:     | 2013                 | Soil Test      | pH 6.2                |
| Cooperator:    | Jason Kalb           |                | P 44 ppm (88 lb/ac)   |
| County:        | Seneca               |                | K 150 ppm (300 lb/ac) |
| Nearest Town:  | Attica               |                | Organic Mater 2.4%    |
| Drainage:      | Tile-40 feet spacing | Planting Date: | May 11, 2013          |
| Soil Type:     | Tiro silt loam       | Row Width:     | 30 inch               |
| Tillage:       | FC and soil finisher | Herbicide:     | Keystone 2.4 qt/acre  |
| Previous Crop: | Soybeans             | Harvest Date:  | October 21, 2013      |
| Variety:       | DK 570               |                |                       |

## Methods

A randomized block design with two treatments and four replications was used. Plots were 12 rows (30 feet) wide and 1,150 feet long. Liquid swine manure from a finishing building was incorporated as a side-dress to corn using a 5,000 gallon Kuhn tanker equipped with a Yetter toolbar with closing wheels. Manure was incorporated to a depth of approximately 6 inches and soil opening covered with dirt.

The swine manure and 28% UAN were applied on the same day while the corn was in the V3 stage. Field conditions were firm at the time of application.

Stand counts taken at the V3 stage indicated a consistent stand of 31,400 plants per acre across both treatments.

The 28% UAN rate was 160 units of nitrogen per acre. All swine manure replications received 4,400 gallons per acre. Manure samples indicated 34.9 pounds of available nitrogen per 1,000 gallons. Available nitrogen is the ammonia portion of the nitrogen in the swine manure and approximately one-half of the organic portion. Swine manure treatments received 168 pounds of nitrogen, 54 lb/ac P<sub>2</sub>O<sub>5</sub> and 134 lb/ac K<sub>2</sub>O.

Swine Finishing Manure Analysis (average of two samples)

| Nutrient                                      | lbs. per 1,000 Gallons |
|---|------------------------|
| Nitrogen (available the 1 <sup>st</sup> year) | 34.9                   |
| Phosphorus as P <sub>2</sub> O <sub>5</sub>   | 11.3                   |
| Potassium as K <sub>2</sub> O                 | 27.9                   |

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

Table 1 Treatment Summary

| <b>Treatment</b> | <b>Description</b>  |
|------------------|---|
| Treatment 1 (T1) | 150 pounds per acre of nitrogen as 28% UAN                        |
| Treatment 2 (T2) | 4,400 gal/ac incorporated liquid swine finishing manure, 168#/a N |

## Results and Discussion

Table 2 Yield Summary

| <b>Treatments</b>        | <b>Yield (bu/ac)</b> |
|--------------------------|----------------------|
| 28% UAN (T1)             | 205.9                |
| Incorporated manure (T2) | 210.8                |

LSD (0.05)

The results of this plot indicated yield differences between the treatments were statistically significant (LSD (0.05) = 5.76, C.V=1.23).

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. 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 4,400 gallons per acre as side-dress nitrogen was \$88 per acre.

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