

Comparison of Dairy 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 dairy manure and incorporated UAN 28%.

Background

Crop Year:	2014	Soil Test:	pH 7.7
Cooperator:	Nate Andre		P 65 ppm (130 lb/ac)
County:	Fulton		K 207 ppm (414 lb/ac)
Nearest Town:	Lyons, OH		PSNT 26 ppm Nitrate N
Drainage:	Undrained		Organic Mater 2.9%
Soil Type:	Ottokee-Mermill	Planting Date:	May 20, 2014
Tillage:	Conventional	Row Width:	30 inch twins
Previous Crop:	Soybeans	Harvest Date:	November 7, 2014
Variety:	G07V88	Rainfall (Apr-Sept):	14.02"

Methods

A randomized block design with two treatments and four replications was used. Plots were 12 rows (30 feet) wide and 1150 feet long. Liquid dairy manure from a dairy manure storage pond was applied via incorporation using a 6,200 gallon Jamesway tanker equipped with a Dietrich toolbar. The Dietrich toolbar incorporated the dairy manure at a depth of five inches using shanks with five inch sweeps.

The commercial fertilizer treatments were sidedressed with 30 gal of UAN on the same day as the manure application. In addition, all treatments received 15 gal of UAN applied as 2x2 in starter. All treatments also received 20 gal of UAN applied with pre-emerge herbicide.

The dairy 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 90 units of nitrogen per acre. All dairy manure replications received 9,000 gallons per acre. Manure samples indicated 3.38 pounds of available nitrogen per 1,000 gallons. Dairy manure treatments received 30.4 pounds of nitrogen, 50.8 lb/ac P₂O₅ and 66.8 lb/ac K₂O per acre.

Table 1. Dairy Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	3.38
Phosphorus as P ₂ O ₅	5.64
Potassium as K ₂ O	7.42

Weather conditions during the time of manure application were sunny with an ambient air temperature of 74 degrees. The plot received well below average rainfall for the growing season.

Table 2. Treatment Summary

Treatment	Description
Treatment 1 (T1)	30 gal/ac UAN 28%, 90#/ac of N
Treatment 2 (T2)	9,000 gal/ac incorporated liquid dairy manure, 30#/ac of N

Results and Discussion

Table 3. Yield Summary

Treatments	Yield (bu/ac)
28% UAN (T1)	142.9
Incorporated manure (T2)	143.0

LSD (0.05)

The results of this plot indicated no significant difference between the treatments (LSD (0.05) = 26.42, C.V=8.21). The dairy manure analysis showed less than half the available nitrogen expected from previous tests so it's possible the dairy manure treatments received more than the 30 pounds per acre of sidedress being reported.

The 28% UAN cost \$0.52 per pound or \$78 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 was approximately \$9.50 per acre.

The manure was available from the nearby dairy farm 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 9,000 gallons per acre as side-dress nitrogen was \$180 per acre.

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