Swine Manure and Anhydrous as Nitrogen Sources at Corn Side-dress

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Objective

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

Background

Crop Year: 2016
County: Fulton
Location: Wauseon, Ohio
Drainage: Random
Previous Crop: Soybeans
Variety: Pioneer 1498
Population: 28,000 seeds per acre
Plant Date: May 5, 2016
Harvest Date: October 19, 2016
Herbicide: Abundant Edge, 2-4D, Instigate, CinchATZ
Soil Type: Colonie, Tedrow sand
Tillage: No-till into cereal rye
Starter Fertilizer: 48-20-105-5s-1z
Pre-Side-dress Nitrogen Test: 5 ppm NO_3-N
Rainfall (May – August): 10.9”

Methods

This trial was designed with two treatments of side-dress nitrogen sources replicated four times in an alternating block design. Plots were 6 rows wide (15 ft) by 450 feet long. The trial was planted, sprayed, and harvested with commercial farm equipment. The 28% UAN nitrogen treatment was made with a commercial toolbar and injection knives. The liquid manure was side-dressed using a 5,200 gallon Balzer tanker with Dietrich shanks that incorporated the manure to a depth of 5 inches. All treatments received 48 units of nitrogen at plant (planter applied + pre-emerge). Manure samples were taken from the tank and analyzed at a commercial lab. This swine manure had a nutrient analysis of 24-3-39 per 1,000 gallons. The side-dress application rate goal was 5,000 gallons/acre of the swine manure and 40 gallons/acre of 28% UAN. A corn stalk nitrate test (CSNT) was taken for every replication and then averaged. Yields and moistures were measured using a calibrated yield monitor and shrunk to 15% moisture. Rainfall data was collected at the nearest CoCoRaHS station OH-FL-11.

Treatments:
1. Swine Manure at sidedress
2. 28% UAN at sidedress

Results

Table 1. Swine Manure vs. 28% at Corn Sidedress

Nitrogen Source	Application Rate (gal/ac)	Units of N/ac Applied at Side-dress	Yield (bu/ac)		CSNT (ppm NO_3-N)
Swine (25-11-33/1,000 gal)	5,000	125	133.6	a	2,293
28% UAN	40	120	114.8	a	447
LSD (P<.05, CV 8.6)			24.28		

Discussion

There was no statistically significant difference in yield between the two nitrogen sources. The ability to match total nitrogen applied between all the sources possibly enabled these treatments to yield the same. This site faced early season drought stress and as such, the moisture and organic matter from the manure likely contributed to the increase in yield for manured treatments. CSNTs indicate that nitrate nitrogen levels are in the optimum range or higher and thus were not a yield limiting factor. Further data in the former multi-year replications will add to the validity of these results.

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