Beef Manure, Anhydrous and 28% as Nitrogen Sources at Corn Sidedress

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Objective

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

Background

Crop Year: 2016
County: Henry
Location: Ridgeville Corners, Ohio
Drainage: Systematic, 25' laterals
Previous Crop: Soybeans
Variety: Pioneer 0843AM
Population: 34,000 seeds per acre
Plant Date: May 23, 2016
Harvest Date: October 31, 2016
Herbicide: 2-4D, CinchATZ, Instigate
Soil Type: Hoytville, Haskins
Tillage: Conventional
Starter Fertilizer: 40-16-120
Pre-Side-dress Nitrogen Test: 20 ppm NO_3-N
Rainfall (May – August): 13.5"

Methods

This trial was designed with three treatments of side-dress nitrogen sources replicated four times in an alternating block design. Plots were 6 rows wide (15 feet) by 850 feet long. The trial was planted, sprayed, and harvested with commercial farm equipment. The nitrogen treatments were made with commercial nitrogen application toolbars. 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 treatment received 40 units of nitrogen at plant (planter applied + pre-emerge). Manure samples were taken from the tank and analyzed at a commercial lab. This beef manure had a 41-26-30 per 1,000 gallons. The side-dress application rate goal was 4,000 gallons/acre of the beef manure, 55 gallons/acre of 28% UAN and 200 pounds/acre of anhydrous ammonia. 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. Precipitation data was recorded by farmer.

Treatments:
1. Liquid beef manure
2. Anhydrous Ammonia (check)
3. 28% UAN

Results

Table 1. Steer Manure vs. Anhydrous vs. 28% at Corn Side-dress

Nitrogen Source	Application Rate	Units of N/ac Applied at Side-dress	Yield (bu/ac)		CSNT (ppm NO_3-N)
Beef (41-26-30/1,000 gal)	4,000 gal/ac	164	220.4	a	1,007
Anhydrous	200 lb/ac	164	222.4	a	580
28% UAN	55 gal/ac	165	218.5	a	960
LSD (P<.05, CV 2.04)			7.78		

Discussion:
There was no statistically significant difference in yield among the three nitrogen sources. The ability to match total nitrogen applied between all the sources possibly enabled these treatments to yield the same. CSNT values indicate that nitrate nitrogen levels at harvest were in the optimum range (250-2,000 ppm, University of Purdue) and thus did not limit yield.

It is believed that the moisture and organic matter added from the manure offset potential compaction concerns in the manure treatments. In the future, dragline injected manure application to growing crops could further offset compaction concerns and further improve yield. Further data in the former multi-year replications will add to the validity of these results.

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