

Swine Manure as a Nitrogen Source at Side-dress for Grain Corn

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Objectives:

- To compare corn yield response to nitrogen applied at side-dress as swine manure and UAN 28%.
- To compare yield response from soil compacted with loaded manure tanker with traditional UAN 28% system.
- To compare yield response from addition of nitrogen stabilizers to swine manure a side-dress with untreated manure and UAN 28% system.

Background

Crop Year:	2008	Soil test:	pH 6.8, P 115 ppm, K 308 ppm, OM 2.39%
Cooperator:	Jerry Niese	Planting Date:	April 20, 2008
County:	Putnam	Row Width:	30 inch
Nearest Town:	Gilboa	Herbicides:	Cinch
Drainage:	Tile-40 ft spacing	Insecticide:	n/a
Soil type:	Fulton silty clay loam	Harvest Date:	October 15, 2008
Tillage:	Conventional	PSNT test:	14 ppm
Previous Crop:	Wheat		
Variety:	Pioneer 33W84		

Methods

A randomized block design with six treatments and four replications was used. Plots were six rows (15 feet) wide and 1,180 feet long. Liquid swine manure from a finishing building was applied via incorporation using a 2,400 gallon Husky tanker equipped with an AerWay toolbar.

The swine manure and 28% UAN were applied on the same day while the corn was in the two leaf stage. The fully loaded manure tanker was used to compact Treatment 2 (UAN 28% + compaction) plots. Field conditions were dry at the time of application.

Nitrogen stabilizers were added to the tanker of manure during the loading process following labeled directions. A total of three stabilizer were evaluated and include: Agrotain (liquid), liquid Guardian and powered Guardian. All three products were supplied by local dealer representatives.

The 28% UAN application rate was 180 units of Nitrogen per acre or 60 gal/ac. The target swine manure application rate was 180 units of nitrogen per acre or 5,000 gallons per acre. The swine manure test results were higher in nitrogen than expected. Manure samples indicated 40 pounds

of available nitrogen per 1,000 gallons. Swine manure treatments received 201 pounds of nitrogen, 129 lb/ac P₂O₅ and 190 lb/ac K₂O.

Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	40.18
Phosphorus as P ₂ O ₅	25.86
Potassium as K ₂ O	37.94

Weather conditions during the time of manure application were sunny and ambient air temperature of 78 degrees. The plot received above average rainfall for the first half of the growing season and very little rainfall during the second half of the growing season.

Treatment Summary	Description
Treatment 1 (T1)	60 gal/ac UAN 28%
Treatment 2 (T2)	60 gal/ac UAN 28% + compaction
Treatment 3 (T3)	5,000 gal/ac swine manure
Treatment 4 (T4)	5,000 gal/ac swine manure + Agrotain
Treatment 5 (T5)	5,000 gal/ac swine manure + liquid Guardian
Treatment 6 (T6)	5,000 gal/ac swine manure + powdered Guardian

Results and Discussion

Yield Summary

Treatments	Yield (bu/ac)
Average of five 28% UAN reps (T1)	206.3 a
Average of five 28% UAN + compaction reps (T2)	207.3 a
Average of five manure reps (T3)	207.3 a
Average of five manure & Agrotain reps (T4)	205.8 a
Average of five manure & liquid Guardian reps (T5)	206.2 a
Average of five manure & powdered Guardian reps (T6)	208.0 a
LSD (0.05)	NS

The results of this plot indicate no statistical difference for yield between any of the treatments. There was no statistical difference between sources of nitrogen when applied at side-dress on these plots. Swine manure appeared to be a satisfactory source of side-dress nitrogen for grain corn in 2008 when compared with UAN 28%. Nitrogen stabilizers did not have a yield effect. Excess nitrogen in the manure replications could have resulted in adequate nitrogen being available throughout the 2008 growing season. Also, the dry weather during the latter portion of the season may have limited corn yields.

In 2008, 28% UAN cost \$0.80 per pound or \$144.00 per acre (\$0.80 x 180 units) plus the cost of application. The manure was available from the farmer's swine finisher building at no cost. Application costs for the manure would vary depending on the farm's equipment and labor costs.

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