Dairy Manure as a Spring Top-Dress Nitrogen Source on Wheat

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Objective

To compare wheat yield response to nitrogen applied at spring top-dress as dairy manure and as Urea.

Background

Crop Year:	2009	Soil test:	pH 6.7 P 70 ppm (140 lbs/a)
Cooperator:	Dave Inkrott		K 210 ppm (410 lbs/a)
County:	Putnam	Organic Matter	3.01%
Nearest Town:	Leipsic	Planting Date:	September 30, 2008
Drainage:	Tile-40 feet spacing	Plot Width:	26 feet
Soil type:	Digby Loam	Plot length	790 feet
Tillage:	Conservation tillage	Herbicide:	N/A
Previous Crop:	Soybeans	Insecticide:	N/A
Variety:	Pioneer 25R47	Harvest Date:	July 9, 2009

Methods

A randomized block design with two treatments and four replications was used. Manure plots were 26 feet wide and urea plots were 40 feet wide. All plots were 790 feet long. Liquid swine manure from an outside dairy storage pond was surface applied using a 3,000 gallon tanker equipped with a modified Pecan toolbar 13 feet in width. Urea was applied using a standard fertilizer buggy.

Urea application rate was 95 pounds of nitrogen per acre. The liquid dairy manure application rate was 11,300 gallons per acre. Manure sample results indicated 4.7 pounds of available nitrogen per 1,000 gallons of dairy manure. Dairy manure treatments received 53 pounds of nitrogen, 15 lb/ac P_2O_5 and 62 lb/ac K_2O. The dairy manure pond was not stirred prior to pumping and the manure was sucked from a depth of approximately three feet. Had the manure storage pond been stirred prior to pumping we would expect higher nutrients levels per 1000 gallons of manure.

Dairy Manure Analysis

Nutrient	lbs per 1,000 Gallons
Nitrogen (available the 1st year)	4.70
Phosphorus as P2O5	1.33
Potassium as K2O	5.49

Weather conditions on April 3rd during the time of manure application were sunny and 65 degrees. The plot received above average rainfall for the 2009 growing season. Field conditions were firm during application.

Treatment Summary	Description
Treatment 1 (T1)	95 lbs./N/per acre as Urea
Treatment 2 (T2)	11,300 gal/ac dairy manure

Results and Discussion

Yield Summary

Treatment	Yield (bu/ac)
Average of four urea reps (T1)	92.3 A
Average of four surface applied manure reps (T2)	87.6 A
	NS

The results of this plot did not indicate a significant statistical difference for yield between the treatments (F= 2.57, P = 0.21). The nitrogen contained in the dairy manure appears to be a satisfactory source of top-dress nitrogen for this wheat research plot. Farmers utilizing manure as a spring fertilizer source for wheat should plan to utilize the excess phosphorus and potassium applied in the following crop rotation.

Urea cost was $0.65 per pound. Urea replications had $61.75 per acre in fertilizer expense plus the cost of application. The manure was available from the farmer's manure storage pond at no cost. Application costs for the manure would vary depending on the farm's equipment and labor costs.

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