

# Comparison of Swine Finishing Manure and Urea as Spring Top-Dress Nitrogen Sources on Wheat Yield

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## Objectives:

To compare wheat yield response to nitrogen applied at spring top-dress as liquid swine finishing manure and urea.

## Background

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Crop Year:	2010	Variety:	Pioneer 25R47
County:	Putnam	Soil Test:	pH 6.4, P 40 ppm, K 160 ppm, OM 2.1%
County/Town:	Leipsic, OH	Planting Date:	September 26, 2009
Soil Type:	Hoytville Silty Clay Loam	Insecticide:	Warrior
Drainage:	Tile-40 ft spacing	Fungicide:	Quadris
Previous Crop:	Soybeans	Harvest Date:	July 2, 2010
Tillage:	Conservation tillage		

## Methods

A randomized block design with two treatments and four replications was used. Manure plots were 45 feet wide and urea plots were 46 feet wide. All plots were 750 feet in length. The center 30 feet of each replication was harvested. Liquid swine manure from a finishing building was applied via surface application using a 6,700 gallon tanker. Urea was applied using a standard fertilizer buggy.

The urea application rate was 105 pounds of nitrogen per acre. The liquid swine manure application rate was 4,200 gallons per acre. Manure sample results indicated 32.3 pounds of available nitrogen per 1,000 gallons of swine finishing manure. Swine manure treatments received 136 pounds of nitrogen, 100 lb/ac  $P_2O_5$  and 125 lb/ac  $K_2O$ .

### Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 <sup>st</sup> year)	32.3
Phosphorus as $P_2O_5$	23.8
Potassium as $K_2O$	29.7

Weather conditions during the time of manure application were sunny and 62 degrees. Field conditions were firm during application. The plot received almost double the normal rainfall for the 2010 growing season. Yields were negatively impacted by Fusarium Head Scab and Stagonospora nodorum Blotch.

**Table 1 Treatment Summary**

Treatment	Description
Treatment 1 (T1)	Urea, surface applied - 105 lbs of N per acre
Treatment 2 (T2)	4,200 gal/ac surface applied swine manure – 136 lbs of N per acre

## Results and Discussion

**Table 2 Yield Summary**

	Yield (bu/ac)
Average of four urea reps (T1)	60.3 a
Average of four surface applied swine finishing manure reps (T2)	61.5 a

The results of this plot indicate no statistical difference for yield between the urea treatments and the surface applied swine manure treatments (LSD (0.05) =3.67). Swine manure appears to be a satisfactory source of top-dress nitrogen for this wheat plot although it should be noted the manure reps had higher rates of nitrogen applied than the urea reps. 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.

The urea cost was \$0.65 per pound of nitrogen so the urea treatments had \$68.00 dollars per acre of purchased fertilizer 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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