

Comparison of Fall Applied Swine Finishing Manure with and without Additional Spring Nitrogen for Wheat Yield

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Objective

To compare soft red winter wheat yield response to fall applied swine finishing manure compared to fall applied swine finishing manure enhanced with 50#/acre of spring applied nitrogen

Background

Crop Year:	2010-2011	Variety:	Dyna Grow 9723
Location:	Shawton, OH	Tillage:	Conservation tillage
County:	Hancock	Soil Test	pH 5.8, P 35 ppm, K 175 ppm, OM 2.4%
Soil Type:	Hoytville clay	Planting Date:	October 12, 2010
Drainage:	Tile – 40 ft spacing	Harvest Date:	July 4, 2011
Previous Crop:	Soybeans		

Methods

A randomized complete block design with two treatments and three replications was used. The manure plots were 39 feet wide and the urea plots were 40 feet wide. All plots were 1,050 feet in length. The center 30 feet of each replication was harvested.

Liquid swine manure from a finishing building was applied to the field at a rate of 4,000 gallons per acre. The manure was injected on 30 inch centers with a Dietrich ® toolbar attached to a 6,400 gallon manure tanker. A 2nd pass was made across the field and 4,000 additional gallons per acre of manure was applied. The manure was applied at 8,000 total gallons per acre on 15 inch centers.

All manure was applied on October 5th approximately two weeks before the wheat was planted. Soil conditions were dry when the manure was applied. In the spring, urea fertilizer was applied in four strips at a rate of 50# of nitrogen per acre.

Table 1 Swine Finishing Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	32.1
Phosphorus as P ₂ O ₅	14.1
Potassium as K ₂ O	27.5

The plot received more than double the normal rainfall in the months of April, May and June for the 2011 growing season. Yields were negatively impacted by *Fusarium* Head Scab and *Stagonospora nodorum* Blotch across all treatments.

Table 2 Treatment Summary

Treatment	Description
Treatment 1 (T1)	8,000 gal/ac manure (257# of N per acre)
Treatment 2 (T2)	8,000 gal/ac manure (257# of N per acre) +50#N on April 5 th

Results

Table 3 Yield Summary

	Yield (bu/ac)
Average of four 8,000 gallons of manure per acre reps (T1)	59.5 _a
Average of four 8,000 gallons of manure per acre reps + 50#/ac urea(T2)	69.2 _a

The results of this plot indicated no statistical difference between fall applied manure treatments and the treatments involving additional urea fertilizer (LSD (0.05) =13.62). The high rate of fall applied swine manure (T1) appears to have supplied adequate nitrogen for this plot.

Summary

Farmers utilizing manure as a fertilizer source for wheat should plan to utilize the excess phosphorus and potassium applied in the following crop rotation. In addition, farmers should note the potential for water degradation when applying large amounts of nitrogen in the fall.

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