Swine Nursery Manure as a Top-Dress Nitrogen Source on Wheat

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Objective:

To compare wheat yield response to nitrogen applied at top-dress as swine nursery manure and UREA.

Background

Crop Year: 2008
Cooperator: Steve Leopold
County: Putnam
Nearest Town: Glandorf
Drainage: Tile-40 ft spacing
Soil type: Fulton Silty Clay Loam
Tillage: Conversation tillage
Previous Crop: Soybeans
Variety: Hopewell

Soil test: pH 6.5, P 92 ppm, K 218 ppm, OM 2.89%
Planting Date: October 3, 2007
Row Width: 7.5 inch
Herbicides: n/a
Insecticide: n/a
Harvest Date: July 16, 2008
PSNT test: n/a

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 1,032 feet long. Liquid swine manure from a nursery building was applied via incorporation 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 90 pounds per acre. The liquid swine manure application rate was 5,300 gallons per acre. Manure sample results indicated 16 pounds of available nitrogen per 1,000 gallons of swine finishing manure. Swine manure treatments received 86 pounds of nitrogen, 22 lb/ac P₂O₅ and 64 lb/ac K₂O.

Swine Nursery Manure Analysis

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>lbs per 1,000 Gallons</th>
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<tbody>
<tr>
<td>Nitrogen (available the 1st year)</td>
<td>16.25</td>
</tr>
<tr>
<td>Phosphorus as P2O5</td>
<td>4.16</td>
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<tr>
<td>Potassium as K2O</td>
<td>12.06</td>
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Weather conditions during the time of manure application were sunny and 70 degrees. Because of the wet spring, the wheat was approximately eight inches tall (Feekes growth stage 5) at the time the treatments were applied on April 17th. Substantial amounts of wheat were flattened, especially by the manure tanker. The plot received above average rainfall for the 2008 growing season. Field conditions were firm during application.

<table>
<thead>
<tr>
<th>Treatment Summary</th>
<th>Description</th>
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<tbody>
<tr>
<td>Treatment 1 (T1)</td>
<td>UREA 90 units per acre</td>
</tr>
<tr>
<td>Treatment 3 (T2)</td>
<td>5,300 gal/ac incorporated swine finishing manure</td>
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</tbody>
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**Results and Discussion**

<table>
<thead>
<tr>
<th>Yield Summary</th>
<th>Yield (bu/ac)</th>
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<tbody>
<tr>
<td>Average of four UREA reps</td>
<td>82.4 a</td>
</tr>
<tr>
<td>Average of four incorporated manure reps</td>
<td>78.1 b</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td>3.23</td>
</tr>
</tbody>
</table>

The results of this plot indicate a significant statistical difference for yield between the treatments. Damage to the wheat during manure application with the tanker could have impacted the wheat yield. Swine manure appears to be a satisfactory source of top-dress nitrogen for wheat.

UREA cost was $0.75 per pound. UREA replications had $68 per acre in fertilizer expense plus the cost of application. The manure was available from the farmer’s swine nursery building at no cost. Application costs for the manure would vary depending on the farm’s equipment and labor costs.

**Acknowledgments:**

The authors would like to thank Steve Leopold for his help with this research plot. The authors would also like to thank the Ohio Pork Producers and Ag Credit for their financial support of this research.

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