

# Soil Fertility Changes and Yield Response to Manure Application

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## Objective

To determine yield response of corn and changes in soil fertility status to manure application over time.

## Background

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Cooperator:	Curt Jones	Planting Date:	May 4, 2004
County:	Fulton	Seeding Rate:	29,600
Soil Type:	Gilford fine sandy loam & Tedrow loamy fine sand	Row Width:	30 inches
Tillage:	No-tillage	Herbicides:	Lumax (2.75 qt) Atrazine (1 qt), AMS (3 pounds) Roundup Original Max (16oz)
Previous Crop:	Soybeans	Harvest Pop:	26,000
Soil Test:	See Table Below	Harvest Date:	October 25, 2005
Fertilizer Rate:	See below		
Variety:	Rupp XR8645		

## Introduction and Methods

A field with no manure history was selected for a study to look at crop response and soil fertility changes to manure application over time. Annual applications of manure will be made to a corn-soybean rotation over time. Plots were established in April of 2005 on a 8 acre field in three replications. Individual plot sizes were 50 by 700 feet long. Soil test were taken March 30, 2005 to establish baseline nutrient status. Core samples (5 at each of 4 points in the individual plot) were taken to 8 inches deep and bulked for each plot. The sample points in each plot were recorded with a Pocket PC equipped with SiteMate software and a Pocket XTrack CF GPS receiver. Manure was applied in early April at a rate of 10 tons per acre with a Knight Slinger spreader. The corn hybrid planted was Rupp XR8645 Yieldguard with Cruiser applied. A John Deere 7200 was used for planting. All plots received starter with 10-34-0 at 7 gal/A and 28% at 13 gallons per acres. The plots were sidedressed with 45 gal of 28% on June 3. Total nitrogen application was 180 pounds and 23 pounds of P<sub>2</sub>O<sub>5</sub>.

## Results and Discussion

Table 1. Background soil test prior to manure application.

Plot	Treatment	OM	P PPM	K PPM	Mg PPM	Ca PPM	pH Soil	pH buffer	CEC
101	Manure	2.5	57	209	120	850	5.6	6.8	8.2
102	No Manure	2.4	64	163	90	800	5.5	6.7	8.8
201	No Manure	2.9	72	150	70	650	5.4	6.8	6.6
202	Manure	3.1	72	121	85	700	5.5	6.8	6.9
301	Manure	2.3	36	134	90	700	5.5	6.8	7.0
302	No Manure	2.4	47	157	85	850	5.7	6.8	7.8

Table 2. Background micronutrient soil test prior to manure application.

Plot	Treatment	S PPM	Zn PPM	Mn PPM	Fe PPM	Cu PPM	B PPM
101	Manure	13	4.2	18	52	1.5	0.4
102	No Manure	14	4.2	19	42	1.2	0.4
201	No Manure	16	4	19	44	1.5	0.4
202	Manure	13	3.4	33	57	1.2	0.4
301	Manure	11	3.8	17	59	1.6	0.4
302	No Manure	10	4.8	32	54	1.5	0.4

Table 3. Manure nutrient analysis on a pounds per ton basis.

Moisture	Solids	Total N	P2O5	K2O	Sulfur	Magnesium	Calcium
1362	638	19	17	15	3.0	3.8	9.2

Table 4. Yield results on corn.

Manure	Corn Yield (Bu/A)
Yes	175.8
No	161.8
LSD (0.05)	NS
CV	10.5%

For additional information, contact:

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