

# Manure as a Replacement for Nitrogen Fertilizer in a Corn/Soybean Rotation (Field 1)

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OBJECTIVE: To determine and document the effect of using **feedlot** manure as a replacement for nitrogen fertilizer on the profitability of a corn/soybean rotation. Two sources of manure used: solid (Tiimerman) and liquid (Mead).

<b>Treatments:</b>	<b>1996</b>	<b>1997</b>
Fertilizer only	105 pounds N/acre	None
Solid '97 (Fertilized in 1996)	105 pounds N/acre	<b>22T/acre</b> solid manure
Liquid '97 (Fertilized in 1996)	105 pounds N/acre	<b>18T/acre</b> liquid manure
Solid '96	22 ton manure/acre + 50 pounds N/acre	None
Liquid '96	18 ton manure/acre + 50 pounds N/acre	None

<b>Comparative cost (per acre)</b>	<b><u>1996</u></b>	<b><u>1997</u></b>
Fertilizer only, 105 pounds N	\$20.63	\$0.00
Fertilizer application	<u>\$ 4.00</u>	
<b>Total</b>	<b>\$24.63</b>	<u>\$0.00</u>
Solid '97, 105 pounds N	\$20.63	
Fertilizer application	\$ 4.00	
Manure (11 T)	<u>\$ 0.00</u>	<b><u>\$19.80</u></b>
<b>Total</b>	<b>\$24.63</b>	<b>\$19.80</b>
Liquid '97 (105 pounds N in 1996)	\$20.63	
Fertilizer application	\$ 4.00	
Manure (9 T)	<u>\$ 0.00</u>	<b><u>\$16.20</u></b>
<b>Total</b>	<b>\$24.63</b>	<b>\$16.20</b>
Solid '96, 11ton/yr	\$19.80	\$19.80
50 pounds N in 1996	\$ 9.82	
Fertilizer application	<u>\$ 4.00</u>	
<b>Total</b>	<b>\$33.62</b>	<u>\$19.80</u>
Liquid '96, 9 ton/yr	\$16.20	\$16.20
50 pounds N in 1996	\$ 9.82	
Fertilizer application	<u>\$ 4.00</u>	
<b>Total</b>	<b>\$30.02</b>	<u>\$16.20</u>

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<b>RESULTS:</b>	<b>1996 CORN</b>	<b>1997 SOYBEANS</b>
<b>Moisture (%)</b>		
Fertilizer only (None 1997)	22.6	12.2
Fertilizer, 1996/Solid Manure '97	22.8	12.2
Fertilizer, 1996/Liquid Manure '97	22.8	12.3
Solid '96/None 1997	23.6 ***	12.3
Liquid '96/None 1997	23.4 ***	12.3
<b>Test Weight (pounds/bushel)</b>		
Fertilizer only (None 1997)	54.8	<b>56.9</b>
Fertilizer, 1996/Solid Manure '97	54.4	56.8
Fertilizer, 1996/Liquid Manure '97	54.4	56.7
Solid '96/None 1997	53.8 *	56.8
Liquid '96/None 1997	54.0 *	56.8
<b>Yield (bushel/acre @ 15.5%)</b>		
Fertilizer only (None 1997)	157 **	52
Fertilizer 1996/Solid Manure '97	166	51
Fertilizer 1996/Liquid Manure '97	165	50
Solid '96/None 1997	170	52
Liquid '96/None 1997	169	51
<b>Population (plants/acre)</b>		
Fertilizer only (None 1997)	21,815	
Fertilizer 1996/Solid Manure '97	24,255	
Fertilizer 1996/Liquid Manure '97	23,210	
Solid '96/None 1997	27,220	
Liquid '96/None 1997	22,025	

\* significantly different at 90% confidence level

\*\* significantly different at 95% confidence level

\*\*\* significantly different at 99% confidence level

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**Summary:** Corn yields were the same for manure treatments and for fertilizer treatments except for the treatment designated as the “fertilizer only” treatment. The reason is unknown. This treatment had the lowest average plant population; however plant population was not related to treatment and this treatment had an average population similar to the Liquid ‘96 treatment.

The use of manure did result in higher grain moisture at harvest and a slightly lower grain test weight in corn in 1996.

The application of manure had no effect on soybeans in 1997.