

Swine Manure Utilization with N-Serve

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Summary and Implications

A two-year research trial at the Southeast Research and Demonstration Farm compared corn yield from land fertilized with swine manure, swine manure with N-Serve, commercial fertilizer and no fertilizer.

Introduction

The production of pigs and crops go hand in hand in Iowa. Sustainable production of grain and pigs requires efficiencies in both enterprises. In order to achieve the greatest value from manure as a fertilizer, proper application rates and treatments must be made. Addition of a nitrification inhibitor (N-Serve) to fall applied manure and different application rates were investigated.

Materials and Methods

In the fall of 2001 and 2002, manure from a deep pit swine finisher barn was applied to soybean ground at the Southeast Research and Demonstration Farm (SERF). Each load of manure was analyzed for nitrogen (N) content and reported as lbs/1000gal. Land application by injection was based on predetermined rates. Eight treatments, each replicated three times are shown in Table 1. Corn yields were compared for swine manure with and without N-Serve, commercial nitrogen fertilizer, and a check plot receiving no fertilizer. Late spring soil nitrate tests (LSNT) and end of

season stalk analysis were used to document sufficiency of nitrogen levels.

Results and Discussion

The manure applied in the fall of 2001 (for the 2002 growing season) was very uniform with an average N content of 40 lb/1000gal. While it appeared that the addition of N-Serve increased yields slightly at the 2000 gal/acre rate, there was no difference in the LSNT or end of season stalk test levels. At 4000 gal/acre, the addition of N-Serve did show a slight increase in the LSNT and end of season stalk test, however there was no increase in corn yield.

Fall 2002 manure applied for the 2003 growing season was not as uniform as previous years. One load of manure had 20 lb/1000 gal N while the remaining loads had nearly 60 lb/1000 gal; this created a difference in manure N levels even with the same volume of manure applied. The best comparison is shown with 4000 gal injected every year and the 4000 gal injected with N-Serve. In this case the addition of N-Serve did show higher LSNT and end of season stalk test levels. However, with excess levels of N available, there was no difference in corn yield. It should be noted that there was a large response to N with over a 70 bu/acre response to the first 40 lb of manure N applied. While there did appear to be some response to the addition of N-Serve with the manure, the rate of manure N applied had a greater affect on N availability and corn yield.

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Table 1. SERF Manure Plot Results

Treatment	Manure N lb/acre	Total N lb/acre	LSNT ppm	Stalk test ppm	Corn Yield bu/acre
<i>2002</i>					
Check	0	0	9	15	103
2000 gal. injected	80	80	12	44	174
2000 gal injected w/ N-Serve	80	80	11	18	183
4000 gal injected	160	160	10	16	211
4000 gal injected w/ N-Serve	160	160	16	113	206
4000 gal injected every year	160	160	12	439	224
8000 gal injected	320	320	12	411	227
Commercial N	0	150	26	120	212
<i>2003</i>					
Check	0	0	10	15	106
2000 gal. injected	40	40	16	153	182
2000 gal injected w/ N-Serve	120	120	23	3072	202
4000 gal injected	75	75	25	184	192
4000 gal injected w/ N-Serve	245	245	59	8160	202
4000 gal injected every year	245	245	41	4390	207
8000 gal injected	150	150	36	5277	217
Commercial N	0	150	39	2063	191