

Report on the Effects of Eggshells and Aglime on Soil pH and Crop Yields

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underestimated the potential of the eggshells
to raise the soil pH.

Introduction

An experiment was established at the Northwest Research Farm (NWRF) in Sutherland to study the effects of aglime and ground eggshells on soil pH and crop yields. The research area was established in 2002. Treatments were applied in 2003.

Materials and Methods

A full report on the soil response and the crop response from this experiment from 2003 and 2004 is available in the 2004 NWRF annual report. The analysis of the eggshell and liming materials are reported in the 2004 report. Corn yields in 2003 were not representative for the season because of a delayed planting date. Soybean yields in 2004 were severely reduced because of damage from a summer hailstorm.

Aglime applications and eggshell applications increased the soil pH in a manner that corresponded to the rate of application. Eggshell applications increased the soil pH to a greater degree than aglime. It is likely that the original analysis of the eggshells

Results and Discussion

The following observations are based on the data presented (Tables 1 and 2). A statistical analysis of the data will be performed in the future to further describe the effects of the treatments.

- The 4000 and 8000 lb/acre of aglime have increased and maintained a higher soil pH than the lower rates of aglime.
- Each of the eggshell application rates seems to have increased the soil pH since the initial application.
- Corn yields were not affected by the application of eggshell or aglime applications in any years of the experiment.
- Soybean yields were increased by each of the eggshell applications.
- Soybean yields were increased by each of the aglime rates. The 500 and 1000 lb/acre aglime rates increased soybean yield to a lesser degree.
- The 2000 lb/acre rate of aglime produced a profitable yield response at economical rates of aglime.

Table 1. Effects of various rates of soil applied aglime and eggshells on soil pH over time.

<u>Treatment</u>						
<i>lb ECCE,</i> <i>aglime</i>	Spring '03 soil pH	Fall '05 soil pH	Fall '06 soil pH	Fall '07 soil pH	Fall '08 soil pH	pH change since '03
0	5.4	5.5	5.5	5.6	5.7	0.3
500	5.4	5.6	5.6	6.0	5.7	0.3
1000	5.3	5.6	5.8	6.2	6.0	0.7
2000	5.4	5.9	6.0	6.5	6.0	0.6
4000	5.4	6.2	6.4	6.7	6.4	1.0
8000	5.3	6.6	6.9	6.4	6.8	1.5
<i>lb ECCE,</i> <i>eggshells</i>						
0	5.3	5.6	5.6	5.5	5.8	0.5
500	5.4	5.9	6.0	5.6	6.2	0.8
1000	5.4	6.1	6.2	5.9	6.3	0.9
2000	5.4	6.5	6.5	6.0	6.7	1.3
4000	5.3	6.7	6.8	6.4	7.2	1.9
8000	5.3	6.8	7.1	6.7	7.3	2.0

Table 2. Effects of various rates of soil-applied aglime and eggshells to crop yields.

<u>Treatment</u>				
<i>ls ECCE,</i> <i>aglime</i>	'05 corn yld, bu/a @15.5%	'06 sb yld, bu/a @ 13.0%	'07 corn yld, bu/a @15.5%	'08 sb yld, bu/a @13.0%
0	192.2	36.6	184.2	59.5
500	196.1	38.5	182.3	61.2
1000	193.9	39.0	184.6	60.1
2000	195.3	39.2	185.7	64.7
4000	196.9	38.0	180.4	63.8
8000	193.9	39.4	190.2	61.6
<i>lb ECCE,</i> <i>eggshells</i>				
0	189.4	33.9	177.2	56.4
500	193.7	34.5	177.1	57.9
1000	193.2	37.0	184.2	60.1
2000	191.0	37.2	187.8	62.2
4000	191.4	38.3	187.3	61.5
8000	192.1	39.5	187.5	62.4