

Effects of Granulite Sludge on Corn Yield

Alan Sundermeier, Agriculture and Natural Resources Extension Agent

Objective

Evaluate the effects of various sidedress N fertilizer levels on corn yields after application of Granulite sludge.

Background

Cooperator:	Roland Rettig	Soil Type:	Clay Loam
County:	Henry	Planting Date:	April 25, 1999
Tillage:	Conventional	Planting Rate:	29,000 seeds/A
Previous Crop:	Wheat	Harvest Date:	October 10, 1999

Methods

Granulite sludge is a dried, pelletized source of organic nutrients with an analysis of 5-3-0 of which 4.5% nitrogen is in the organic form and 0.5% inorganic nitrogen is readily available. In this study, Granulite was broadcast and incorporated the summer of 1998 on wheat stubble. It was applied at the rate of 4,000 lbs/acre to the entire study area. Nitrogen was applied at planting at a rate of 25 lb/acre actual N as 28% liquid.

All inputs in the study area were the same except sidedress nitrogen. Four randomized replications of four nitrogen rates were applied at 0, 60, 100, and 140 lbs/acre. Each plot harvested was 12 rows wide and 330 feet long.

Corn stalk nitrate samples were taken after black layer on September 17, 1999.

Results

Table 1. Effect of Sludge Application Rates.

Sludge-Inorganic N (lbs/A)	Planting N (lbs/A)	Sidedress N (lbs/A)	Total N (lbs/A)	Yield (bu/A)
20	25	0	45	168.3 A
20	25	60	105	191.3 B
20	25	100	145	191.3 B
20	25	140	185	194.9 B
LSD (0.05)				9.7

Summary and Notes

In the stalk nitrate test the coefficient of variation was very high at 78.2 %. Because of this variation in data, we were unable to detect significant differences in stalk nitrate levels. Readings between 700 to 2,000 ppm nitrate are considered optimum. The 45 lb/acre rate of total N had a stalk reading of 25 ppm indicating N deficiency. All other N rates were in the optimum range.

The 0 lb/acre additional sidedress nitrogen rate was significantly less yield compared to all other sidedress rates.

Table 2. Economic Analysis.

Sidedress N Rate (lbs/A)	Yield (bu/A)	Yield Gain over 0 N Rate (bu/A)	Additional Revenue over 0 N Rate (\$/A @ \$2/bu)	N Cost (\$/A @ \$0.15/lb)	Additional Profit (\$/A)
0	168.3	---	---	---	---
60	191.3	23	46	9	37
100	191.3	23	46	15	31
140	194.9	26.6	53.2	21	32.2

In this study, the rate of 60 lb/acre sidedress N (105 lb/acre total N) was the most economical. Stalk nitrate levels also show adequate N available at this N rate.

The amount of release of usable nitrogen from Granulite sludge is difficult to predict. Organic sources are slow to decompose and may not match crop needs during the growing season. However, an organic source of nutrients can enhance soil quality and benefit plant growth.

For additional information, contact:

Alan Sundermeier
The Ohio State University Extension
sundemeier.5@osu.edu