Crop and Soil Status as Indicated by Electrical Conductivity Surveys of a Field with Cover Crop and Manure Amendments. (S11-eigenberg163946-Poster)

Authors:

- R.A.Eigenberg - *USDA-ARS*
- J.A.Nienaber - *USDA-ARS*
- B.L.Woodbury - *USDA-ARS*
- R.B.Ferguson - *SCREC, University of Nebraska*

Abstract:

This report details the third year of a study to determine whether differences in electromagnetic (EM) soil conductivity and available N levels during a corn growing season was linked to nutrient transformation and uptake. The study site has been treated with manure and compost for nine years at rates matching either the phosphorus or the nitrogen requirements of silage corn (Zea mays L.). The plot was split for sub-treatments of a rye (Secale cereale L.) winter cover crop and no cover crop. A series of soil conductivity maps of the cornfield were generated using a global positioning system (GPS) and EM induction methods with two dipole modes taken simultaneously. Soil electrical conductivity (ECa) readings over time revealed dynamic changes in the soil both spatially and with a depth component. Nitrogen mineralization was modeled using soil respiration, nitrate usage, and crop uptake models. The model outputs provided useful insights into the soil/crop nutrient dynamics when compared to a temperature corrected EM output. The EM method for assessing soil condition displayed the dynamics of nitrate in the research cornfield, and soil chemical analyses and soil and crop models supported this observation.

Corresponding Author Information:

Roger Eigenberg
USMARC
Box 166
Clay Center, NE 68933

phone: 402-762-4272
fax: 402-762-4273
e-mail: eigenberg@email.marc.usda.gov

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