Using Soil Electrical Conductivity (EC) to Interpret Soil and Crop Production Variability

Farmers and consultants want tools to help them understand the reasons for within field yield variations, as a step toward varying input (e.g., fertilizer and chemical) rates for improved profitability and environmental protection. One such tool is sensing of soil electrical conductivity (EC), which research has found to be commonly related to grain production. Farmers using commercially available EC sensors are raising questions about data collection and interpretation procedures. We have investigated the effects of data collection procedures on accuracy and have compared the two types of commercial EC sensors, suggesting data collection methods and guidelines. Our research has documented the relationships between EC and soil properties, both within specific soil associations, and over multiple states. We have also investigated the correspondence between EC and grain yields. *Our research has repeatedly shown that soil EC maps can readily delineate within-field soil variations that impact water storage and transport and that also affect key crop management decisions, such as determining optimum rates of fertilizers and chemicals.* The guidelines and information developed in this work have been disseminated to farmers, consultants, and researchers across the U.S. and internationally through invited presentations, guide sheets, and web sites. The two largest manufacturers of EC sensors for agriculture cite our research reports as reference material for their customers.

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