

## **Value of pH Soil Sensor Information**

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### **ABSTRACT**

This study estimates the potential value of automated pH sampling to corn and soybean farmers in the Midwestern United States. The study has three parts: a theoretical model of expected profits from crop production with alternative sources of soil pH information; the estimated cost of sensor information under farmer ownership, custom service and rental scenarios; and an empirical example of the value of sensor data for one field in east central Indiana. The economic trade off between grid soil sampling and laboratory tests, or soil sensor data is the choice between relatively accurate information at a few points, or somewhat less accurate information at many points. Estimates indicate that the value of yield lost due to sensor measurement error is relatively small. In the empirical example the increased density of samples provides over two thirds of the total benefit of automated sampling, more than offsetting the higher measurement error. The estimated cost savings of using sensor information compared to manual sampling on 2.5 acre grid are about \$1.18/a for the rental case and \$1.44/a for the custom operator scenario. The general conclusion of this study is that the pH soil sensor has the potential for modest farm level economic benefits. Further research and development work on improving sensor accuracy appears to be justified.

**Keywords:** Sensors, information, pH, soil fertility, profitability

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