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Using multiple soil nitrogen tests marginally improves corn nitrogen management

October 16, 2020

South Dakota Extension Soil Fertility Specialist Jason Clark evaluating corn growth in the fertilizer-nitrogen rate project. Photo by Sadie Vander Wal.

Typical soil nitrogen (N) tests used to make fertilizer-N recommendations for corn do not explicitly account for N that becomes available to corn from decomposition of organic matter (mineralization) during the growing season. Using both soil N and N mineralization tests may improve the accuracy of current corn fertilizer-N recommendations.

A recently published article in *Agronomy Journal* reports on a U.S. Midwest regional project that included 49 site-years. Soil N and N mineralization were measured and related to the fertilizer N rate needed to obtain the economically optimum corn yield.

Corn economically optimum N rate was better predicted by soil N tests from soils sampled near the rapid uptake stage of corn (V6 corn development stage) compared with those taken before planting. Including a N mineralization estimate with soil N further improved the prediction of an economically optimum N rate for corn. However, this improvement was insufficient to recommend use of these soil tests alone to improve N management.

Farmers need reliable and accurate tools to help make N management decisions to produce an economically profitable crop while minimizing potential negative environmental effects. Therefore, identifying tools they can use toward this end will continue to be a research priority.

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Clark, J.D., Fernández, F.G., Veum, K.S., Camberato, J.J., Carter, P.R., Ferguson, … & Shanahan, J.F. (2020). Soil-nitrogen, potentially mineralizable-nitrogen, and field condition information marginally improves corn nitrogen management. *Agronomy Journal, 112*. **https://doi.org/10.1002/agj2.20335**

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