Changes in Nitrogen Use Efficiency of Winter Wheat Using In-Season Methods of Determining Topdress N Requirement. (S04-phillips101216-Poster)

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Abstract:

Currently in Virginia, topdress N rates for winter wheat are determined using site-specific recommendations based on tiller densities and tissue N contents measured midseason. While this variable-rate system has improved N use efficiency (NUE) compared with applying predetermined N rates, it has not addressed within-field variability at high spatial resolutions. Recently developed optical sensor-based fertilizer technology has the capability to make variable-rate N applications to each 1-sq m in the field based on midseason estimates of grain yield potential. The objective of this study was to evaluate differences in NUE when using the sensor-based technology compared with traditional methods used to make topdress N recommendations in Virginia. Field studies were conducted at two sites in eastern Virginia from 1999-2002. Sensor-based N recommendations made using midseason estimates of grain yield potential typically resulted in N reductions of 15-30 kg N/ha compared to other methods. No difference in grain yield was observed among treatments. These factors resulted in increased NUE of approximately 17% when using sensor-based technology compared with traditional methods.

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