Grain Yield and Soil-Test Spatial Variability under Uniform or Variable-Rate Phosphorus and Potassium Fertilization. (S08-mallarino113815-Poster)

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Abstract:

Variable-rate (VR) fertilization may reduce within-field nutrient and yield variability while maintaining or increasing yield. Replicated strip trials were established in nine Iowa fields (28 site-yr) to compare VR and uniform-rate (UR) P or K fertilization for the corn-soybean rotation. Treatments were a check, VR based on soil tests from 0.1-0.3 ha grid soil sampling, and UR based on field-average soil tests. Grain was harvested with yield monitors. Yield response to P or K fertilizer was observed in most fields, but there was no significant yield difference between VR and UR. The total amount of fertilizer applied was usually smaller with VR. Yield standard deviations (SD) indicated inconsistent differences between methods, but modeled semivariograms showed that VR reduced the proportion of spatially structured yield variability. Soil-test SD was usually lower for VR because more P or K was applied to low-testing areas and less to high-testing areas, but the spatial structure of the soil-test variability was not consistently affected. Current VR fertilization can reduce nutrient variability and avoid excess fertilization of high-testing areas, but will not necessarily produce higher or less variable yields.

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