Terrain Pattern Relationships in an Eroded Hummocky Landscape. (S06-schumacher112646-Poster)

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Abstract:

Terrain patterns based on recurring groupings of soil properties are often associated with spatial variation in crop production potential within agricultural fields. Accelerated erosion including the erosive agents of tillage, water, and wind often modifies soil properties and terrain patterns. The objectives of this study were: 1) to measure terrain patterns based on bulk electrical conductivity, soil strength, crop yield, and aerial photographs on a landscape with a long history of intensive tillage; and 2) to compare the relationship of these terrain patterns with modeled patterns of tillage and water erosion. Bulk electrical conductivity, soil strength, and crop yield were measured on a grid of 10 m x 10 m with a total of 304 sampling points. Tillage erosion and water erosion models (TEP v. 1.0, WATEM v. 1.0) were used to estimate changes in soil depth from accelerated erosion across the 4 ha study area. Patterns predicted from tillage erosion were associated more closely in this landscape with observed patterns of soil strength, crop yield, and aerial photographs than were patterns predicted from water erosion models.

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