Sparse Data and Spatial Reality, the Vision of Remote Sensing for Directed Sampling. (A08-blumhoff101940-Oral)

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Abstract:

Sampling methods that use remotely sensed data could improve pest stress mapping and aid in directing agricultural pesticide applications. The objective of this study was to determine whether crop scouting could be enhanced from remotely sensed data for three crop fields (29 ha, 12ha, and 45ha) located in Tippecanoe County, Indiana. The ground sample locations were determined from classifications derived from hyperspectral and multispectral data. Ground reference data included plant height, chlorophyll, rootworm damage, hand-yield estimates, and yield monitor measurements. The relationship between attributes and image intensity values were fit to a linear equation and R2 of (0.65, 0.73, <0.3, 0.59, 0.78) respectively for the 45 hectare cornfield. Mapping spatial conditions involved a Normal Matching procedure and ordinary kriging on ground sampled data from the zigzag and directed scouting methods. Results were verified using a jackknife error validation procedure. The directed sampling method provided an accurate solution to improve pest sampling practices, given the requirements of site-specific applications on commercial fields.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 2:15 pm

Keywords:

Remote Sensing, Site-specific management, crop scouting, directed sampling