Plotting Crop Scouting Paths with a Self-Organizing Feature Map. (A03-ferreyra175611-Oral)

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Abstract:

Crop scouts collect data to assist management decisions such as the timing and dosage of crop protection applications. Recently the possibility of optimizing profits through site-specific application has led to site-specific scouting. We show a way to integrate scouting into a spatial database. We represent the variability of crop-influencing factors in a field using available GIS data layers, and propose a scouting path that explores the probability distribution of those data using a Kohonen self-organizing feature map (SOFM). We constrain the SOFM with the specified number of sampling points and total path length. The path can be downloaded to a GPS-enabled handheld computer. We present a case study in a soybean field near Murray, KY. Benefits of the method include simple scouting-to-application map conversion, greater accountability, delegation potential, and monitoring the field over time by repeatedly scouting the same areas. Drawbacks include hardware / software needs, the learning curve, and possibly increased scout time costs. Our future research will include replacing the SOFM with GTM, another latent variable model that, unlike SOFM, is based on a probability density model.

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