Comparison of Three Zone Delineation Methods and their Impacts on Water Quality. (S11ralston131137-Poster)

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Abstract:

A study of precision agriculture and related subsurface water quality was recently initiated near Oakes, ND. Yield, electrical conductivity, aerial photographs, and soil nitrogen data were used to delineate management zones. Two variable rate application treatments were compared and evaluated against a uniform application using a randomized block experimental design. Water quality was monitored beneath each of three treatments using disturbed and undisturbed lysimeters. The goal of this study was to determine and compare the impact of nutrient management zones on crop yield and water quality. To date, the following layers of information have been collected: soil nitrate-nitrogen, electrical conductivity, yield, aerial photographs, elevation and one field season of water quality data. From these layers of data it was found that no direct correlation existed between any two of the individual data sets. However, cluster analysis uncovered a correlation between three of the data sets: deep electrical conductivity, 0-61 cm soil nitrogen, and yield. Using cluster analysis, nutrient management zones were developed.

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