

## **Using a Geostatistical Approach for Soil Salinity and Yield Management**

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**Abstract.** This paper presents a practical method to manage soil salinity and yield in order to obtain maximum economic benefits. The method was applied to a study area located in the south eastern part of the Arkansas River Basin in Colorado where soil salinity is a problem in some areas. The following were the objectives: 1) generate classified maps and the corresponding zones of uncertainty of expected yield potential for the main crops grown in the study area; 2) compare the expected potential productivity of different crops based on the soil salinity conditions; 3) assess the expected net revenue of multiple crops under different soil salinity conditions. Different scenarios of crops and salinity levels were evaluated. Indicator kriging was applied to each scenario to generate maps that show the expected percent yield potential areas and the corresponding zones of uncertainty for each of the different classes. The results of this study show that indicator kriging can be used to generate guidance maps that divide each field into areas of expected percent yield potential based on soil salinity thresholds for different crops. Zones of uncertainty can be quantified by indicator kriging and therefore it can be used for risk assessment of the percent yield potential. Wheat and sorghum show the highest expected yield potential based on the different soil salinity conditions that were evaluated. Expected net revenue for alfalfa and corn are the highest under the different soil salinity conditions that were evaluated.

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