SHORT-SCALE SOIL SPATIAL VARIABILITY OF A SALT-AFFECTED LAND ALLOTMENT IN GRAIN LEGUME AND OIL CROPS RESEARCH AND DEVELOPMENT CENTER, *AGUNUKOLAPELESSA*

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Investigation of short-scale soil spatial variability is important to manage salt affected soils. This study aimed to investigate short-scale spatial variability of a salt-affected land allotment at the Grain Legume and Oil Crops Research and Development Center, *Agunukolapelessa*. Soil samples (n=54) from 0-30 cm depth were randomly collected to analyse for EC, pH, exchangeable (Ex) Na, K, Mg, Ca and percentages of sand, silt and clay particles. Sodium absorption ratio (SAR), exchangeable sodium% (ESP) and base saturation (BS) were calculated for each sample location. Spatial variability maps were prepared using Ordinary Kriging Procedure. Delineation of potential management zones (PMZs) was performed using Fuzzy *k* mean spatial cluster analysis technique. Significant differences of the measured and the calculated chemical parameters between PMZs were identified using t-test. The results revealed the high potential for developing a sodium rich salt-affected (sodic) soil in the study site. Exploratory data analysis revealed higher spatial variability in EC, Ex.Na, SAR, ESP (coefficient of variation: CV>60%), moderate spatial variability (12%<CV<60%) in soil Ex.K, Ex.Mg, Ex.Ca, Clay%, and Silt%. Fuzzy *k* mean algorithm identified two PMZs in the study site. Soil pH, EC, Ex.Na, Ex.Mg, Silt%, BS, ESP, and SAR were significantly higher in PMZ2 ($p<0.05$). Soil Ex.K and Clay% were significantly higher in PMZ1 ($p<0.05$). However, Ex.Ca and Sand% did not show any significant differences between two PMZs. The cross-validation procedure revealed a strong agreement ($R^2>0.8$) between the real and predicted values.

Keywords: Ordinary Kriging Procedure, Potential management zones Salt-affected soils, Short-scale spatial variability