

# SPATIAL VARIABILITY OF SELECTED SOIL CHEMICAL PROPERTIES IN RESEARCH FIELD OF REGIONAL RICE RESEARCH AND DEVELOPMENT CENTRE, BOMBUWELA

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Better understanding of soil nutrient variability in the research field is a key factor to minimize errors of field experiments conducted in research stations. Knowing of nutrient levels in the soil is an additional benefit to maximize productivity and reduce environmental pollution by unnecessary application of chemical fertilizers. Therefore, a study was conducted to estimate spatial distributions and variability of the chemical characteristics in the research field of Regional Rice Research and Development Centre (RRRDC), Bombuwala. Locational information was collected using Magellan 510 Geographic Positioning System (GPS). One hundred soil samples were collected from 0–15 cm to cover 9 hectares of study area. Soil organic matter, pH, available phosphorous (P), exchangeable potassium (K), iron (Fe), manganese (Mn), copper (Cu) and zinc (Zn) were measured. Soil maps were prepared to cover the entire research field and actual nutrient requirements were quantified. Results showed a significant field variability of tested chemical properties. Means and standard deviations of P, K, Fe, Cu, Zn, Mn and soil pH were  $8.9\pm 5.6$ ,  $40.3\pm 29.2$ ,  $425.2\pm 198.1$ ,  $0.27\pm 1.2$ ,  $6.6\pm 5.3$ ,  $3.4\pm 2.4$  and  $5.1\pm 0.4$ , respectively. Mapping of soil parameters indicated that soil pH has a significant effect on nutrient variability in the field. Nutrient maps further illustrated that, P levels in the field varied as high (15%) medium (13%) and low (72%). Exchangeable K in the field also reported variation as high, medium and low representing, 4%, 8% and 88% of the entire field. Findings of the study revealed that mapping of nutrients could be an effective tool to reduce over application of chemical fertilizers that lead to nutrient pollution in surface and ground water sources. It further provides information on nutrient variability, which is useful to design field experiments.

**Keywords:** Environmental effect, Fertilizer cost, Potassium, Soil available phosphorous, Spatial variability