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SPATIAL ASSESSMENT OF SOIL SALINITY BY ELECTROMAGNETIC INDUCTION SURVEY

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Abstract

Salinization occurs in natural conditions as a result of a complex of factors such as climate, topography, and hydrogeology. Salinity principally occurs in sub-humid to arid regions but secondary salinization is a consequence of direct human activities it extends by the day. In the field, soil salinity is deduced from apparent electrical conductivity (ECa) by using a range of devices. Although a number of proximal sensors have recently been used worldwide to simplify fieldwork, few studies using new technologies have been addressed in Romania. The objective of this study was to assess the spatial variability of the apparent electrical conductivity of saline soils using a DUALEM instrument in Valea Sărată (Cluj). Spatial variability maps were generated by using of a geostatistical method. Significantly higher ECa was detected in poorly drained areas close to water channels (ECa above 1000 mS/m), while lower and less variable ECa values were recorded on the side slopes (ECa < 200 mS/m). These areas correspond with eutric salic regosol identified on upper lands. The map of ECa measurements at surface show a higher variability of salinity then at depth at which the ground water dissolved the salts. The instrument proved to be more efficient compared with traditional methods, regarding soil salinity mapping and delineating the soil boundaries.

Keywords: DualEM sensor, electromagnetic conductivity, salinization, soil electrical conductivity, spatial variability

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