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Available water content: spatial variability analysis with geostatistics

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Abstract. The Available Water Content (AWC) is often calculated and used both during irrigation management plans and inside some crop growth models, assuming that a single value can efficiently represent the whole surface of soil.

The present study aims at assess this hypothesis and study the structure of the AWC variability through some geostatistics techniques. A better knowledge on the spatial variability of the AWC can be useful for a better management of the irrigation water for rice when the crop is cultivated under "flushing" system on large and not homogeneous fields.

The study was carried out in 1997 at the Experimental Farm "A.Menozzi" of the State University of Milan. Disturbed soil samples were collected from a field larger than the average due to some previous surfaces recompositions works. The basic grid was a square mesh with nodes at intervals of 50 m. The soils was sampled at each node at two depths: the first at 0 - 30 cm and the second between 30 and 50 cm.

The water contents were determined through pressured ceramic plates at pressure of 0.1 and 1.5 MPa. The calculated AWC values were statistically and geostatistically analysed. After having analysed the experimental semivariogram, the best interpolating equation was chosen basing on C, Co + C, RSS, and R2 parameters.

The Block Kriging (BK) was applied for interpolating and for cartographically representing the results.

AWC ranged between percentage values of 14 and 20 for the 0 - 30 cm layer, whereas the range of the lower layer was wider.

During the seminar statistical and graphycal results, by pointing out and discussing the applicability of geostatistics to site specific farming, were presented.

Key words. geostatistics, spatialisation, Available Water Content (A WC).

