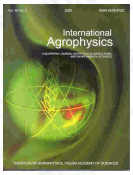

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Comparison of soil thermal properties in cultivated fields determined using soil water content measured by two methods

(get PDF)

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abstract Results of the measurements of water content in the topsoil layer (1-6 cm) in fields with various crops obtained by gravimetric and reflectometric (TDR) methods have been used for the calculations of soil volumetric heat capacity, thermal conductivity, and diffusivity. Calculation values of individual soil thermal properties obtained in the two ways were then analysed by means of statistical and geostatistical methods and compared (correlation coefficients, regression equations, difference distributions, mean square errors, and maximum relative errors were determined). Compatibility of values of thermal properties as determined on the basis of soil moisture measured by means of gravimetric and TDR methods, was generally speaking, satisfactory, even though not uniform in various soil moisture ranges; it is better with higher moisture levels, and worse when moisture levels were low. More accuracy in spatial distribution of thermal properties obtained on the basis of soil moisture as measured by gravimetric than by reflectometric method points to the lower sensitivity of the TDR method for the soil moisture measurements.

keywords soil thermal properties, soil water content, TDR methods