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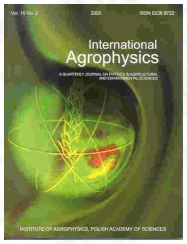

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Accessibility of most frequently used physical parameters of soil structure, reliability of measured values, lack of replicates and ways out of this dilemma

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abstract Assessment of soil structure and still more its changes is impeded by peculiarities of sampling and measurement. Unavoidable local destructions tend to advance use of small numbers of replicates, samples or sampling locations. Ways out of this dilemma are discussed using the results which were obtained in the project 'Qualitative and quantitative assessment of soil structure functions for the sustainable agricultural plant production'. Bulk density(BD) and saturated hydraulic conductivity (CSAT) are the most frequently used primary parameters of soil structure. The stastistical behaviour of these both is most different. High variability of CSAT usually precludes measurement at a sufficient number of replicates for statistic analysis - particularity at soil depths below topsoil. BD has smaller variability but much smaller sensitivity as well. For measurements at greater depths in soils it is preferable nevertheless owing to the lower number of necessary replicates. A two-level outflanking procedure might facilitate sampling problems by first applying an easy-going nondestructive, unspecific method to create a narrow grid of values as a first step which might help to rationalize choice of sampling locations for destructive samplings and in-situ measurements.

keywords bulk density, saturated hydraulic conductivity, limited data-sets, outflanking techniques