
MINI-JET DEVICE AS A TOOL FOR DETERMINATION OF SOIL ERODIBILITY CHARACTERISTICS

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The article describes a method for determining the erodibility of incohesive agricultural soils by means of the critical shear stress measuring. The “Jet Erosion Test” (JET) was used to determine the critical shear stress. The measurement was performed using a modified Mini-JET device. The device is very suitable for field measurements, because it is small, light, requires a relatively small amount of water, and can be operated by single person. The principle of measuring the critical shear stress of the soil is based on monitoring the rate of erosion crater formation by the action of a water jet of known kinetic energy. Based on the erosion crater development, the erosion parameters of the soil, such as the critical shear stress and the erodibility coefficient, can be calculated.

All Mini-JET experiments were performed on experimental plots near Řisuty (central Czechia). Two different types of soil surface were utilized for the experiments. Bulk density, soil texture, soil water content, aggregate stability, and total organic carbon were determined. A total of 75 simulations were performed.

A large variability of the soil parameters was found, which is characteristic for agricultural topsoils. Nevertheless, the determined values of the erodibility coefficient are comparable with the previously published values and can thus be used for implementation in the physically based soil erosion models. Based on the tests performed, it can be stated that the Mini-JET method is feasible for agricultural soils. However, in order to obtain representative erodibility values, a sufficient number of replications must be performed.