

Assessment and Comparison of Two Sets of Pedotransfer Functions for Prediction of Some Points of Soil Moisture Characteristic Curve

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Abstract

Soil moisture characteristics curve has a great importance in soil and water researches related to irrigation and drainage, soil conservation and solute transport. Since the direct measurement of this characteristic of the soil is time-consuming and expensive, the estimation of soil moisture curve points by using pedotransfer functions and reliable soil properties can save cost and time. The aim of the present study was assessment and comparison of Ostovari-Beigi (2013) and Ghanbarian-Millán (2010) pedotransfer functions, both of which were derived from the same database (UNSODA), for estimating 8 points of soil moisture curve. For this purpose, data of 119 soil samples of Europe (HYPRES database) were used. Results revealed that functions of Ostovari-Beigi (2013) have a good and similarity performance with the function of Ghanbarian-Millán (2010) at low suctions. At high suctions and near the permanent wilting point, Ostovari-Beigi (2013) functions, which used the fractal dimension of soil texture as an independent variable input, had a higher performance than Ghanbarian-Millán (2010) functions. Also, at some suctions, both Ostovari-Beigi (2013) and Ghanbarian-Millán (2010) functions did not have appropriate performances for estimation of the soil moisture. Generally, it can be concluded that the performance of Ostovari-Beigi (2013) functions (with one input parameter, the fractal dimension) in predicting the retention curve points is similar to, and sometimes better, than the functions of Ghanbarian-Milan (2010) (with a large number of input variables).

Keywords: Fractal dimension, Ghanbarian-Milan functions; HYPRES, Moisture curve, Ostovari-Beigi functions, Pedotransfer functions.

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