عنوان مقاله:

Mathematical model of soil cation exchange capacity using GMDH-type neural network and genetic algorithm

محل انتشار:

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خلاصه مقاله:

Measuring the cation exchange capacity (CEC) for all horizons of every map unit component in a survey area is very time consuming and costly. This study was conducted (i) to evaluate the group method of data handling (GMDH) neural network (NN) and genetic algorithm model and (ii) to compare GMDH-type NN with other artificial neural networks such as the multilayer perceptron (MLP),radial basis function (RBF) and regression-based models for predicting CEC in soils of Lahijan, north of Iran. In this study, the proposed model was trained before requested predictions. The data set was divided into two parts: 70% were used as data for training (110 soil samples), and 30% (40 soil samples) were used as a test set, which were randomly extracted from the database. In order to evaluate the models, coefficient of determination (R2), mean square error (MSE), root mean square error (RMSE) and mean absolute deviation (MAD) were used. Results showed that the GMDH-type and MLP-NN models had larger R2 values than the multiple regression and RBF models. The results of GMDH model were very encouraging and congruent with the experimental results. In general, the GMDH-type-NNs models provided more reliable predictions than the artificial neural networks (ANNs) and regression-based models.

کلمات کلیدی:

Clay GMDH model Multivariate regression Pedotransfer functions

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