ANTI-DEFLATION RESISTANCE ASSESSMENT MODELS FOR ARABLE SAND AND LOAMY SAND SOILS OF BELARUS

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A regression analysis was performed in the MS Excel software package to establish the relationship between soil resistance to deflation and its agrochemical (pH_{KCl}, humus content, mobile P_2O_5 and K_2O, and cations Ca^{2+} and Mg^{2+}), physical-chemical (base saturation and hydrolytic acidity), and agrophysical (bulk density and porosity) properties. Moderate and strong dependencies were established only between the content of stable aggregates larger than 1.0 mm and the content of Ca^{2+} cations (r=0.48 for sandy loam soils and r=0.72 for sandy soils), and the total moisture capacity (r=0.65 for sandy loam soils and r=0.53 for sandy soils). Based on the relationships obtained, models for assessing resistance to deflation were developed. For sandy loam soils, the model is as follows: U = –18.31+0.00842Ca+1.0836PV, for sandy soils: U = 0.0181Ca – 0.3284, where U is the content of deflation-resistant aggregates (%); Ca is the content of Ca^{2+} cations (mg kg^{-1} soil); and PV is the total water capacity of the soil (%). The significance and statistical reliability of the model equations are confirmed by correlation coefficients greater than 0.7 and the results of Fisher's exact test. The developed models have high predictive value and enable analysis of soil deflation stability based on a limited amount of data without the need for labor-intensive laboratory analysis.

Keywords: anti-deflation resistance, Ca^{2+} cation content, total water capacity, regression analysis, assessment model.