



Problem of the soil calcium sufficient status with respect to Mehlich III extraction solution

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Due to a polyfunctional significance of soil calcium as well as the application of common soil extract Mehlich III for some years, the agrochemical practice feels the need to declare at least the „border” or the „threshold” extractable soil calcium concentration.

On the basis of the regressive-statistical evaluation of a relative high populated ($n = 987$) soil data set having medium coarse structure the high significant relationship between a calcium extractable by Mehlich III and soil pH has been studied. The dependence of the soil calcium concentration

(10 – 9.000) mg.kg⁻¹ on a soil pH value (3.5-7.7) has shown polynomial character with a high enough ($r = 0.87$) statistical significance. The calculated function break-point was at the vicinity of pH-values 4.80-5.20. Probably just in the vicinity of this soil pH-value occurs in soil set studied a saturation of the most attractive exchangeable positions by calcium ions at the expense of „active” aluminium forms and after the overcome the „break” soil pH-value of 5.5 more intensive growth of calcium concentration takes place in soil sorption complex.

Hence, in appropriate soil „subset” ($n=109$) with soil pH ranging within 3.55-6.88 having no carbonate content some relations among soil pH, Mehlich III soil calcium, cation exchange capacity (CEC) and CEC extent saturation by soil calcium were evaluated. In this soil subset showed the dependence CEC extent saturation by calcium on soil pH-value close correlation ($r = 0.843$) This dependence has sigmoidal shape with break point at the vicinity of pH 5.6 and the Ca-CEC extent saturation near 60 %.

Taking into consideration both „safe” yet soil pH-value and favourable CEC extent saturation the reasonable sufficient soil calcium value in Mehlich III solution and medium coarse soils has been assessed as high as 1 400 mg.kg⁻¹.