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## **EFFECT OF ROCK PHOSPHATE AND SUPERPHOSPHATE APPLICATION ON MOBILITY OF ELEMENTS (Cd, Zn, Pb, As, Fe, Mn) IN CONTAMINATED SOILS**

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### **Abstract**

Weakly acidic Litavka and alkaline Malín soils are some of the most contaminated soils by multiple risk elements in the Czech Republic. The aim of this paper was to determine the effect of P sources (rock phosphate, superphosphate), each applied at three rates on the mobility of risk elements (Cd, Zn, Pb, As) and micronutrients (Fe, Mn) in soils and to compare their effectiveness with lime and dolomite tested in our previous study. In 7, 14, 28, and 42 days, we determined CaCl<sub>2</sub>-extractable and acid-extractable concentrations of elements by ICP-OES. In alkaline soil, there was an increase in Cd, Zn, As, and Mn CaCl<sub>2</sub>- and acid-extractable concentrations after superphosphate application but no effect on concentrations of these elements after rock phosphate application. In acidic soil, there was a decrease in CaCl<sub>2</sub>-extractable concentrations of Cd and Zn and no effect on CaCl<sub>2</sub>-extractable Pb, As, Fe, and Mn after rock phosphate application. With the exception of a decrease in Pb and Mn, the same trends were recorded for acid-extractable concentrations. Superphosphate was less effective than rock phosphate for immobilisation of CaCl<sub>2</sub>-extractable Zn, As, and Mn. Phosphate additives were ineffective for immobilisation of all tested elements in alkaline soils. In acidic soils, phosphate additives were ineffective in immobilising As and Fe compared to lime application and were substantially less effective in Cd and Zn immobilisation than lime. Superphosphate application was a suitable measure to decrease acid-extractable Pb concentrations only in acidic soils at higher rates and was comparable with lime application at lower rates.

**Key words:** acetic acid-extractable concentrations, CaCl<sub>2</sub>-extractable concentrations, chemical immobilisation, micronutrients, risk elements

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