

Modeling temporal variations in adsorption of applied zinc and phosphorus in alkaline-calcareous soils

Mr. Muhammad Imran¹, Dr. Abdur Rehim¹, Dr. Shahid Hussain¹

¹*Department of Soil Science, Bahauddin Zakariya University, Multan, Pakistan*

Zinc (Zn) and Phosphorus (P) deficiencies are widespread in most alkaline-calcareous soils. Most of the applied Zn and P are adsorbed on soil colloidal surfaces short after their applications. The objective of current investigation was to determine interactive effect of Zn and P fertilization on fixation and availability of applied nutrients. Levels of Zn (0, 4, 12 mg kg⁻¹ soil) and P (0, 40, 120 mg kg⁻¹ soil) were applied in all possible combinations to three differently textured soils (clay, loam and loamy sand) in pots. The soils were incubated for 20, 40, 60, 90 and 120 days at 25±5 °C and the AB-DTPA soil test was used to determine labile fractions of Zn and P. Adsorption of Zn and P depended on the applied rate and inherent soil properties. Percent adsorption of added Zn and P increased with increasing clay content and this adsorption behavior of soil was best described by Michaelis-Menten equation. Most of the fixation of Zn and P took place within 65-75 days after their addition in soils. Labile Zn in soil was reduced by P application but labile P was not as significantly affected by Zn application. The findings indicated clear interaction of P and Zn in soil solution.