

Phosphorus sorption capacity in relation to soil properties in profiles of sandy soils of the Keta sandspit in Ghana

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ABSTRACT

The sandy soils of Anloga in the Volta region form part of the Keta basin. The soils are infertile and of low productivity but are intensively cultivated for vegetables such as shallot (*Allium cepa*). Farmers have augmented the fertility of the soils by adding cow dung and poultry manure for the past seventy years. To study the P dynamics in the soils, three profiles were dug on cultivated (F) and two on uncultivated (U) fields to study P accumulation and sorption after decades of cultivation. The results showed that total P content was 533 mg P kg⁻¹ at the depth of 50 cm and below in the F-profiles compared to 416 mg P kg⁻¹ of similar depth of the uncultivated soils, suggesting some movement of P from the surface soil into the subsoil. The maximum P sorption capacity of the U soils was low (92.6 mg kg⁻¹) but higher than those of the F soils (58.8 mg P kg⁻¹). Multiple regression analyses showed that pH and Ca were the two major determinants of P sorption in the soils. The degree of P saturation (DPS) of the surface soils of the cultivated soils was higher than the average critical value of 25% DPS of an arable land but in the lower depths of the cultivated soils, the DPS decreased tremendously below the critical level of 25% which meant that these depths were not saturated well enough to enhance leaching of P to the underground waters.