Effects of phosphate fertilizer sources on the availability of some phosphate fractions in the lateritic soils of intermediate zone of Sri Lanka

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Abstract

The present study investigated the application of three phosphate (P) fertilizer sources; Imported Rock Phosphate (IRP), Eppawela Rock Phosphate (ERP) and Triple Super Phosphate (TSP) on the short term availability of different P fractions in the lateritic soils in the intermediate zone of Sri Lanka. The available different P fractions in pots with and without Ruzi grass (*Brachiaria ruziziensis* L.) as an indicator plant was determined after six months from the date of application of the fertilizers. Each P fertilizer was applied in triplicate at three different levels, viz., 15, 30, 60 mg P_2O_5 /100 g soil, separately into pots with and without Ruzi grass. The control with and without Ruzi grass was also carried out in triplicate without fertilizers. The soil moisture content in all the pots was maintained at 60% field capacity. Phosphorus concentration and total dry matter content of grass were determined bimonthly over a period of six months. The soils were analyzed for the concentrations of different P fractions, viz., saloid bound P (Sa–P), aluminium bound P (Al–P), iron bound P (Fe– P), occluded P (Occ–P) and calcium bound P (Ca–P). The results revealed that Ruzi grass utilized more Sa-P and Al-P fractions than Occ-P, Fe-P and Ca-P fractions. The P uptake by Ruzi grass was low for both IRP and ERP compared to TSP application. Both ERP and IRP fertilizers did not show any significant P increase with increasing level of their application. Unlike ERP and IRP, the TSP a pplications showed a linear increase of P uptake by Ruzi grass with increasing the level of P treatment. The overall results indicated that TSP is superior to IRP and ERP for short term application, though IRP was found to be slightly better than ERP in providing available P.

Keywords: Rock Phosphates, Triple Super Phosphate, Short term availability of Phosphorus Fractions