

INORGANIC PHOSPHATES WITH COMPOST ON SOIL PHOSPHORUS AVAILABILITY AND ON NODULATION, GROWTH AND YIELD OF GRAIN LEGUMES ON NON CALCIC BROWN SOILS

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Mungbean (*Vigna radiata*) and cowpea (*Vigna unguiculata*) are very important grain legumes grown in drier regions of Sri Lanka. Due to high phosphorus (P) sorption capacities of the soil, substantial phosphorus inputs are needed especially for legumes. Replacing relatively higher priced Triple Super Phosphate (TSP) with Eppawala Rock Phosphate (ERP) receives more attention.

The field experiment was conducted during *Maha* season 2009/10 to ascertain the interaction effect between compost and inorganic phosphate fertilizers (TSP and ERP) on soil phosphorus availability, growth, nodulation and yield of mungbean and cowpea. The treatments included two levels of compost (5 and 10 tons ha⁻¹) combined with TSP and ERP at the rate of 60 kg P₂O₅ ha⁻¹ and a control (P source TSP). The experiments were laid out in Randomized Complete Block Design with three replications. Soil and plant growth parameters were measured at two week intervals after three weeks of sowing.

The available soil P was significantly increased in cowpea and Mungbean by the addition of compost (5 t ha⁻¹) with TSP than that of ERP after three weeks of sowing. Soil P availability was inferior in plots treated with ERP. Shoot dry weights were significantly increased in mungbean and cowpea by incorporation of 10 t ha⁻¹ compost with TSP in comparison to ERP respectively. Root lengths of mungbean and cowpea, were increased significantly by the application of ERP with 5 t ha⁻¹ compost after three weeks of sowing. Nodulation was increased up to seven week by application of 10 t ha⁻¹ compost with TSP. Grain yields were not significant among treatments. However, yield improvement was observed by application of TSP with compost. Application of ERP with higher rate of compost also resulted similar yields to TSP (control). Thus, results revealed that the application of compost improved potential yield of grain legumes through increased root growth and prolonged effective nodulation. However, results revealed the limited use of ERP in studied soil condition.

Key words: Compost, Inorganic phosphate, Non calcic brown soils, Nodulation, Grain legumes