EVALUATION OF OPTIMUM AVAILABLE PHOSPHOROUS EXTRACTION METHODS FOR REDDISH BROWN EARTH SOIL

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Several extraction methods are used to determine plant available Phosphorus (P) that affect growth and yield of plants. This study was conducted to evaluate different available P extraction methods for Reddish Brown Earth (RBE) soil in the dry zone of Sri Lanka. The experimental design was Randomized Complete Block Design (RCBD) with four replicates. The study was conducted at Kahatagasdigiliya in Anuradhapura District during *Maha* (2013/2014) season. Seven extraction methods i.e. Olsen's, Bray 1, Borax, Mehlich III, Modified Kelowna, Ammonium Chloride and Distilled Water were tested. Soil samples were collected at the tasseling stage of maize plants (*Zea mays* L.), treated with four fertilizer rates: 0 (T_1), 20 (T_2), 30 (T_3) and 40 (T_4) kg of P ha^{-1}. Soil samples were analyzed for pH, available P and total P, apart from the initial chemical characterization. The effect of extraction methods for soil available P and the P recovery, interactions among the P levels with different extraction methods were evaluated. Available P extraction and P recovery using Modified Kelowna method was significantly greater than other methods ($p<0.05$). Olsen's, Bray 1, Borax, Mehlich III, Ammonium Chloride extraction methods were not significantly different ($p>0.05$) in available P determination. The extraction methods and fertilizer levels were significantly different ($p<0.05$) with soil available P. The P extractions in T_4 treated soils were comparatively higher than in other methods, except in distilled water extraction. Modified Kelowna method was the most appropriate in available P extraction under experimental conditions in RBE soil.

Keywords: Phosphorus, P extraction methods, P recovery, RBE