Estimation of Phosphorus fixing capacity of potato and vegetable growing soil in Welimada in Badulla distric

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Long term chemical fertilizers on vegetable cultivation predominant in Badulla Disrtict, thereby it may be caused environment badly. Phosphorus is an essential element for plant growth and development and fixation of available form of phosphorous is dominant in soils which are applying high doses of P fertilizers. The study was conducted to investigate the Phosphorus fixing capacity and relationship between selected physiochemical properties in three regions of Welimada in Badulla district. Forty-eight soil samples were collected from Keppetipola, Bogahakumbura and Boralanda regions under basis of yaya representing composite sample. The selected areas are the mainly potato and vegetable growing regions of upcountry intermediate Zone of Sri Lanka. Three undisturbed soil samples from each region and forty-five farmer’s field samples were collected for the analysis. The collected soil samples were analyzed for pH, electrical conductivity (EC), cation exchange capacity (CEC), exchangeable K, available P, total phosphorus and phosphorus fixing capacity. Phosphorous fixing capacity was determined using the 100 ppm KH2PO4 solution. Then P fixing capacity was determined by subtracting added P from remaining P concentrations in soil solutions. The simple correlations and multiple regressions were followed for the analyses of data. Results envisaged that soil pH ranged between 4.21-6.91, EC between 0.8-1.8 (Sm/cm), available P between 42.5-245 mg kg1, OM from 1.2 to 4.0 %, exchangeable K varied from 70 to610 mg kg-1, CEC between 10 -52 ( cmolc kg-1).and total phosphorus content from 186.4 to 5068.6 mg kg-1. However, P fixing capacity ranged from 7.85- 43.89%. The height mean P fixation was reported in Boralanda (19.54%) regions. The lower P fixations mean was observed in Keppetipola (17.32 %) while Bogahakumbura reported in-between value of 18.45%. Undisturbed (natural forest) soils recorded the highest mean P fixing capacity, which was 59.97%. Results showed that negative significant correlation (p=0.016) between phosphorous fixing capacity and available P. However, regression analysis showed that the P fixation capacity was significantly increased with low pH and lime application can then be recommended for the reclamation of acid soils in Badulla District.

**Keywords:** available phosphorus, Phosphorous fixing capacity, soil physiochemical properties