B-49: Exchangeable potassium status of some cultivated soils in the Dry Zone

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Plants take up potassium (K) mainly from exchangeable fraction of K in soil. It is generally accepted that the minimum requirement level below which the effects of lack of K appear is approximately 39 ppm of exchangeable K in soil. Aim of this study was to determine exchangeable K content and its nature of distribution in 4 soils namely Reddish Brown Earth (RBE), Low Humic Gley (LHG), Non Calcic Brown (NCB) and Regosol soils which are being intensively used for crop cultivation in the Dry Zone of Sri Lanka. For this purpose, 739 composite soil samples collected from 0 - 20 cm depth of farmer fields under the Soil Testing Service of the Department of Agriculture were used. These soils consisted of 250, 294, 134 and 61 samples from RBE, LHG, NCB and Regosol soils respectively. The exchangeable K in soils was extracted with 1 N ammonium acecate and the K content in the extract was determined by a flame photometer.

Results showed that mean exchangeable K content was 90, 74, 54 and 39 ppm in RBE, LHG, NCB and Regosol soils respectively. Further, 35, 38, 63 and 77% of samples respectively received from RBE, LHG, NCB and Regosol soils contained an exchangeable K content of less than 39 ppm. It reveals that the majority of NCB and Regosol soils and a considerable portion of RBE and LHG soils are deficient in potassium.

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Results showed that pH ranged from 4.5 to 8.3, 4.1 to 10.2, 4.1 to 9.6 and 4.5 to 8.6 in RBE, LHG, NCB and Regosol soils respectively. The distribution of pH in the ranges of <6.5, 6.5 - 7.5 and <7.5 was 61, 33 and 6% in RBE soils; 56, 29 and 15% in LHG soils; 74, 16 and 10% in NCB soils and 49, 33 and 18% in Regosols respectively. It clearly reveals that pH of majority of these soils does not lie within the suitable pH range with respect to soil nutrient availability.