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Vertical Distribution of Readily and Slowly Available Potassium in a Typic Haplustept under Different Cropping Sequences

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Abstract: Vertical distribution of different forms of potassium in a soil under long-term (34 years) field experiment of paddy-wheat, maize-wheat and arhar-wheat cropping sequences were studied. The soils of experimental site were found to be low to medium in available K and and high in non-exchangeable K. The exchangeable K and non-exchangeable K followed almost similar pattern as followed by available K and HNO_3 extractable K respectively with depth suggesting their close association. The fertilizer treated plots were found to be relatively higher in different K fractions compared to the control plots in all the cropping sequences. The control and fertilized plots under paddy-wheat, maize-wheat and arhar-wheat sequences showed increase in non-exchangeable K within a half-meter depth. The water soluble K significantly and positively correlated with organic matter ($r = 0.48^{**}$) whereas the exchangeable K had positive but non-significant relationship with clay due to its low content. The exchangeable and non-exchaneable K has shown their affinity with two different sources, the former more with clay fraction whereas later more with silt fraction. As compared to paddy-wheat and maize-wheat sequences, relatively higher depletion of potential K reserve from the surface horizon (0-24 cm) in arhar-wheat may be due to lower root biomass addition in the latter.

Key Words: Soil properties, Potassium fractions, Correlation, Cropping sequences