NON EXCHANGEABLE POTASSIUM IN PADDY FIELDS AND ITS RELATIONSHIP WITH PLANT POTASSIUM UPTAKE AND GRAIN YIELD

H.M.Y.G.N.K. Herath[1], D.N. Sirisena [2]and D.M. Jinadasa[1]

[1]*Department of Soil and Water Resources Management, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura.*
[2]*Rice Research and Development Institute, Batalagoda, Ibbagamuwa.*

Potassium is an important nutrient in rice cultivation. An experiment was conducted at the Rice Research and Development Institute, Batalagoda to evaluate the measures for efficient utilization of potassium sources in rice cultivation. The experiment was comprised of six treatments namely; no K fertilizer (T_1), Rice Straw only (T_2), K fertilizer at 40 kg K_2O/ha with rice straw (K applied as 20 kg at basal and 20 kg at PI) (T_3) , K fertilizer at 20 kg K_2O/ha with rice straw (K applied at basal) (T_4), K fertilizer at 20 kg K_2O/ha with rice straw (K applied at PI) (T_5) and K fertilizer at 40 kg K_2O/ha (K applied as 20 kg at basal and 20 kg at PI) (T_6) were arranged in Randomized Complete Block Design with four replicates. Rice straw was applied at the rate of 5 t ha^{-1}. Soil samples were analyzed for exchangeable K and non-exchangeable K and plant samples were analyzed for total K contents. Yield and yield components were recorded at harvesting. Soil and plant K content in T_1 was significantly low throughout the growing season in comparison to T_2, T_3, T_4, T_5 and T6. However, shoot dry matter, yield components and grain yield were not significantly different among treatments. The highest exchangeable K and non-exchangeable K contents were recorded in treatment which received K fertilizer at 40 kg $ha^{-1}$with rice straw. Correlation between exchangeable K with plant K uptake was inferior to non-exchangeable K with plant K uptake and the highest correlation ($r^2 = 0.60$) between non-exchangeable K with plant K uptake was recorded at nine weeks after planting. Results suggested that non-exchangeable K is a good indicator of K supply for rice plant growth and the best time to measure the K supplying capacity of soil was nine weeks after planting.

Key words: Potassium, Rice cultivation, Rice Straw