

ASSESSMENT OF SOIL WATER AND NUTRIENT AVAILABILITY IN CRITICAL STAGES OF CONVENTIONAL AND ORGANIC PADDY BLOCKS IN THE FACULTY FARM

H.G.A.U. Shalika and M.G.T.S. Amarasekara

*Department of Agricultural Engineering and Soil Science, Faculty of
Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

Rice is one of the main agricultural crops grown in Sri Lanka. Different growth stages of rice need different amounts of water and nutrients. This study aimed to assess soil nutrient availability at critical stages of the crop with the application of fertilizer and organic manure at the rate in which recommended by Department of Agriculture (DOA) for both conventional and organic farming under supplementary irrigation. Soil samples were drawn from both conventional (DOA chemical fertilizer recommendations) and organic rice farming (only compost 10 T ha⁻¹) plots one week after each fertilizer application during *Maha* 2023/2024 and analysed for soil chemical parameters. Irrigation water supply was also measured using a Parshall flume installed in the inlet of the paddy field. Data analysis was done by *t*-test using *R* studio software. Results revealed that the mean values of available N, P and exchangeable K of conventional plot and organic plot at panicle initiation (PI) stage were 3.97±1.41, 16.96±4.29, 104.57±2.01 and 3.5±2.13, 17.22±1.14, 101.65±2.57 ppm, respectively. Even though, no significant difference was observed between two systems, N and K levels were reported below critical levels (N-100, K-160 ppm) at panicle initiation stage. Results further revealed that there was no significant difference of plant height and number of tillers between conventional and organic plots at PI stage. The mean values of available N, P and exchangeable K in irrigation water were 1.6±0.35, 0.62±0.07 and 6.5±2.29 ppm, respectively. It indicates that irrigation water itself provides a certain amount of nutrients required for plant growth. However, irrigation water requirement was very low due to heavy rains received during study period. Results conclude that available soil N and K levels were below the optimum level even though DOA recommendations were followed.

Keywords: Panicle initiation, Rice, Soil nutrient availability