EFFECT OF DIFFERENT FERTILIZER SYSTEMS ON GROWTH, YIELD AND WEED ABUNDANCE OF RICE CROP IN ITS SECOND YEAR OF TRANSITION FROM CONVENTIONAL TO ORGANIC

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Conventional agricultural activities are prominent in Sri Lankan lowland rice cultivation, which is prominently attributed by application of mineral fertilizers. Excessive application of mineral fertilizer adversely affects the environment and human health. An integrated approach of mineral fertilizer management and gradual transformation of such systems to organic without forfeiting yield is very important. This study was accompanied the second year of the transition of conventional to organic system in the Research Unit of the Faculty of Agriculture, Rajarata University of Sri Lanka. The objective of the research was to study the effect of different fertilizer systems on growth, yield and weed abundance of rice crop during Maha season 2019/2020. The Department of Agriculture fertilizer recommendation (DOA) and 50% of DOA with organic manure supplement to equalize recommended N supply were used as conventional and reduced fertilizer systems, respectively. Sole organic manure application, which equalized the mineral N of reduced system was the organic fertilizer system. The three fertilizer systems were arranged in a Randomized Complete Block Design with twelve replicates and Bg300 variety was broadcast with 120 kgha⁻¹ rate. Plant height, dry mass, number of tillers, light interception, relative chlorophyll content and final grain yield were significantly (p < 0.05) higher in conventional system compared to the rest. Among three fertilizer systems, conventional system was better followed by reduced and organic systems. Weed density of organic system at seedling (20 DAS) and panicle initiation (40 DAS) stages were significantly (p < 0.05) higher compared to the rest. Conventional system recorded the highest yield (0.63 kgm⁻²) followed by reduced (0.54 kgm⁻²) and organic (0.48 kgm⁻²) systems. There was no significant difference in yield between conventional and reduced systems while organic system has significant difference with conventional system. The organic system can be used as a sustainable method for rice cultivation in the dry zone. However, long-term studies are required to understand the performance of organic system in the dry zone of Sri Lanka.

Keywords: Conventional, Organic, Reduced, Rice, Weed abundance