

14th Annual Research Symposium Proceedings



Faculty of Agriculture
Rajarata University of Sri Lanka

2022

SOIL NITROGEN MINERALIZATION POTENTIAL OF SELECTED ORGANIC FERTILIZER PRACTICES IN RICE CULTIVATION

**A.J.M.S.H. Jayasekara¹, G. Seneviratne², E.M. Herath² and
J.P.H.U. Jayaneththi¹**

*¹Department of Agricultural Engineering and Soil Science, Faculty of
Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura,
Sri Lanka.*

²National Institute of Fundamental Studies, Hanthana, Sri Lanka.

The inorganic chemical fertilizer (CF) usage in rice cultivation is limited due to the present economic crisis on the importation of CFs. Thus, organic fertilizers are being promoted with more attention towards nutrient-enriched granular compost (GC) and biofilm biofertilizers (BFBF). However, field studies have not been done thus far to evaluate the effect of organic fertilizers on soil nitrogen mineralizable (SNM), and rice yield. Therefore, this study was conducted to evaluate the SNM in organically managed rice soils and its influence on grain yield during *Yala* 2022 season. Three farmer fields with different soil and climatic conditions were selected from Hambantota, Trincomalee, and Ampara. Three organic fertilizer practices were applied; farmer-made compost (FC)+KCl+liquid organic fertilizer (LOF); FC+BFBF+biofilm-treated Eppawala rock phosphate (BF-ERP)+LOF+KCl, and GC (3:5:2/NPK)+BFBF. The experiments were arranged in a randomized block design with three replicates for each practice. Plant and soil parameters were analysed at 50% flowering. Data were statistically analysed using analysis of variance followed by mean separation using Tukey's HSD test. The level of probability considered was 0.10 for this study, being farmers' field experiments. The significantly highest SMN was observed in GC + BFBF practice together with high content of total N and microbial biomass carbon. Moreover, the significantly highest rice grain yield was also recorded in GC+BFBF practice. Therefore, it can be concluded that the increased SMN and microbial activity in the GC+BFBF practice have supplied sufficient N to generate the highest yield in rice. However, further field studies are needed to introduce this practice to the farming community.

Keywords: Biofilm biofertilizer, Granular compost, Nitrogen mineralization, Organic farming, Rice cultivation