

ROLE OF BIOFILM BIOFERTILIZER ON GROWTH, YIELD AND NUTRITION OF RICE

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Rice (*Oryza sativa* L.) is the largest food crop production system in Sri Lanka. Extensive use of synthetic fertilizers in these systems to obtain high crop yields is witnessing serious negative impacts. Biofilm biofertilizer (BFBF) is identified as a supplementary strategy to cut down the chemical fertilizer (CF) requirement. Early studies have identified that BFBF application can cut down up to 50% of the CF from Department of Agriculture (DOA) 2001 recommendation for rice without hampering grain yield. Since the DOA recommendations have changed, there are no sufficient studies carried out to evaluate the effect of BFBF application with the new recommendation (2013). Therefore, this study was conducted to evaluate the potential of BFBF on growth, yield and nutrition by analyzing the plant, rhizosphere soil and microbial parameters. Six treatments consisted of different levels (0, 65%, 80% and 100%) of DOA 2013 CF and BFBF + 65% CF and BFBF+80% CF arranged in randomized complete block design with three replicates established in *Thoda* farm Dehiaththakandiya Sri Lanka. Treatments with the 65% CF + BFBF showed decrease ($p < 0.05$) in number of tillers per hill, and number and weight of unfilled grains per panicle, compared to DOA 100% CF (2013). Furthermore, the 65% CF + BFBF treatment showed increase ($p < 0.05$) of soil moisture and rhizosphere soil nitrogen compared to 65% CF. Nonetheless, no any significant ($p < 0.05$) differences were observed in seed nutrition and microbial parameters among treatments. It is concluded that BFBF contributes in achieving a sufficient grain yield without changing the nutrition level, improving grain filling and increasing soil fertility while reducing the amount of CF. However, further studies are required to confirm the effects of BFBF + CF in rice to interpret the most suited BFBF + CF combination based on DOA 2013 recommendation.

Keywords: Biofilm biofertilizer, Chemical fertilizer, Grain yield, Rice