

IMPACT OF BIOFILM BIOFERTILISER-BASED BIO-ORGANO-MINERAL FERTILISER PRACTICE ON PEST AND DISEASE MANAGEMENT IN RICE CULTIVATION IN SRI LANKA

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In rice cultivation, the use of eco-friendly fertilisers is becoming important to enhance crop productivity by supporting nutrient availability, and effective insect pest and disease management. This study examined the effectiveness of biofilm biofertiliser-based bio-organo-mineral fertilisers (BOMF) on insect pest and pathogen management, and in enhancing crop productivity in rice cultivation. Field experiments were conducted in Ampara district using a randomised complete block design with three replicates. The fertiliser practices and control tested were: (a) BOMF practice (500 kg BOMF NPK ha⁻¹ + 2.5 L BFBF ha⁻¹), (b) hybrid practice (225 kg BOMF PK ha⁻¹ + 62.5 kg CF N ha⁻¹ + 2.5 L BFBF ha⁻¹), (c) chemical fertiliser (CF) practice (340 kg CF NPK ha⁻¹, as per the Department of Agriculture recommendations), and (d) control (no fertiliser). The percentages of plants with pest attacks (PP) and diseases (PD) were measured at the 50% flowering stage, using density counting method based on observations from three quadrants per plot. Grain dry yield was measured at harvest. Statistical analyses included One-way ANOVA and Tukey's HSD test following normality confirmation. The control (3.14%), BOMF (1.59%), and hybrid fertiliser (4.82%) practices showed significantly ($p < 0.05$) reduced PP compared to CF practice (16.86%). The BOMF (19.54%) and hybrid fertiliser (17.04%) practices showed significantly ($p < 0.05$) reduced PD compared to CF practice (31.29%) and control (32.47%). In addition, the hybrid fertiliser practice achieved significantly ($p < 0.05$) the highest crop yield (7804 kg ha⁻¹), while BOMF (4470 kg ha⁻¹), CF (4641 kg ha⁻¹), and control (3816 kg ha⁻¹) produced comparable yields. In conclusion, the eco-friendly BOMF-based hybrid fertiliser practice effectively manages insect pests and diseases in rice while enhancing grain yield, demonstrating strong potential for sustainable rice cultivation.

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