

EFFECT OF BIOFILMED BIOFERTILIZER ON RICE GROWTH IN THE NATIVE SOILS OF THE COMPONENT MICROBES

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The haphazard application of synthetic chemicals in agriculture has led to loss of beneficial microbial communities leading to deteriorating soil productivity and environmental quality. Application of Plant growth promoting rhizobacteria (PGPRs) is widely tested world over to overcome this problem and increasing productivity in different plant species has been demonstrated. Use of biofilmed biofertilizers (BFBFs) is speculated to be more beneficial than the use of monoculture PGPRs and it has been found that use of in vitro produced BFBFs could reduce the use of recommended chemical fertilizers by about 50% in certain crops which would be of great importance in terms of environmental health and economy. The aim of this study was to test the effect of an in vitro formulated BFBF on the growth and yield of rice in soils from which the component bacterium and fungus of BFBF were isolated. Rice variety BG 357 was grown in pots in a green house, in two paddy soils with different salinity levels from Ampara District in Sri Lanka. Five treatments namely 100% recommended chemical fertilizer, 50% recommended chemical fertilizer, 50% fertilizer with the BFBF, the BFBF alone and the control with no fertilizer or BFBF were applied. Growth and yield parameters were recorded at harvest and analysed statistically. The BFBF did not have any effect on plant growth although it significantly improved the seed germination and seedling vigour index in a germination assay. The less saline soil had a significantly higher shoot growth compared to high saline soil and the root growth was vice versa although the total dry weight did not differ. The filled grain dry weight was higher in the less saline soil although the soil type did not affect the 1000 grain weight or filled grain percentage. The 50% chemical fertilizer applied with BFBF improved the filled grain percentage, filled grain dry weight and 1000 grain weight significantly compared to the 50% chemical fertilizer alone treatment and this effect though not significant at 5% probability level, was higher than the 100% chemical fertilizer application regardless of the soil type. Similar effects have been reported with different plant species including rice and further studies need to be carried out under field conditions.

Key words: rice, biofertilizer, BFBF, PGPR