

Influence of biofertilizer on growth improvement of aerobic rice genotypes

ABSTRACT

Biofertilizers have emerged as a potential environment friendly inputs that are supplemented for proper plant growth. Two field experiments were conducted at University Putra Malaysia (UPM), Selangor, Malaysia during 1st season (May to September 2015) and 2nd season (September to December 2015) to evaluate the performance of aerobic rice genotypes under different combinations of bio and chemical fertilizer. The experiment consisted of five (5) biofertilizer combinations (chemical fertilizer recommended rate (CFRR) (150 N; 60 P₂O₅; 60 K₂O kg ha⁻¹) 100%, biofertilizer 1 ton + 75% CFRR, biofertilizer 2 tons + 50% CFRR, biofertilizer 3 tons + 25% CFRR, and biofertilizer 4 tons) and three aerobic rice genotypes (MRIA1, MR219-4 and MR219-9) laid out in a split-plot in randomized complete block design (RCBD) with 3 replicates. Results revealed that application of biofertilizer 1 ton + 75% CFRR produced the highest plant height (102.65 cm) and an number of tillers (20.38) in the 2nd season, the highest grain yield (4.30 t ha⁻¹) than the other biofertilizer treatments in the 1st season. MR219-4 produced the highest number of tillers, leaf area and leaf photosynthesis rate in both seasons, grain yield (5.02 t ha⁻¹) in 1st season while MR219-9 produced the highest crop biomass (52.76 g hill⁻¹) and crop growth rate (8.00 g hill⁻¹ week⁻¹) at 12 WAS, grain yield (3.86 t ha⁻¹) than the other genotypes in the 2nd season. The trend in these results indicated that biofertilizer tend to be more effective with limited chemical fertilizer in the 1st season of low rainfall. These results concluded that 1 ton biofertilizer + 75% CFRR and MR219-4 enhances rice growth and grain yield in aerobic condition.

Keyword: Rice production; Eco-friendly; Rice varieties; Sustainable agricultural system; Chemical fertilizer.