

Direct and residual effects of zinc on zinc-efficient and zinc-inefficient rice genotypes grown under low-zinc-content submerged acidic conditions

ABSTRACT

Zinc (Zn) deficiency has been identified as a major cause of poor yield in rice. Flooding and submergence bring about a decline in available Zn due to pH changes and the formation of insoluble Zn compounds. A field experiment (undisturbed randomized complete block design with three replications) was conducted in farmers' fields of Kedah state during 2008 and 2009 to determine the direct and residual response of Zn on rice genotypes at the rates of 0 and 15 kg Zn ha⁻¹ in low-Zn-content acidic submerged soil. The genotypes differed significantly in grain yield and its components. Single application of Zn significantly increased the growth and yield of the crop for two seasons. Based on the grain yield efficiency index, the most Zn-efficient genotypes were MR 106 and Seri Malaysia Dua. Two genotypes, MR 220 and MR 219, were moderately efficient, but MR 211 and Bahagia were classified as inefficient.

Keyword: Acid soil; Flooded; Residual Zn; Rice; Zn efficiency