

Evaluation on Performance of Seed Treatments Techniques in Withstand Submergence Conditions of Rice (*Oryza sativa L.*) Varieties

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Abstract

Rice (*Oryza sativa L.*) is wetland crop that is the major food source in Sri Lanka. However, rice crop performance is decrease due to the flood-prone areas and submergence affect poor rates of germination, which has a substantial impact on direct rice seed. Hence, the present study was carried out to evaluate & development of the performance of seed treatments techniques in withstand submergence conditions. Here, four rice varieties were coated with Alginate and Sodium Lauryl Sulphate (SLS) and primed with Gibberellic Acid, Ascorbic Acid & Calcium Chloride (CaCl₂). Five-days-old seedlings were completely submerged 1m height in tank for 6,12, and 14 days which arranged in Randomized Complete Block Design (RCBD) with three replicates. The results showed that the germination, morphological characteristics of rice plants were significantly ($p<0.05$) affected by the treatments. The germination indicates were significantly higher in Ld 368 and Bw 372 non treated seeds compared to coated & primed seeds. The highest survival percentage (100%) showed by Ld 376 & Bw 372 with CaCl₂ and Ld 368 with SLS survival percentage at 10th day recovery. The highest Shoot Elongation recorded Gibberellic Acid 80 ppm seeds under 14 Days submergence conditions. Vigor Index was higher in Ascorbic Acid 50 ppm treatment rather than the non-treated seeds, whereas Alginate & CaCl₂ observed the highest root shoot ratio among the Seed treatment agents seeds under 6 & 12Days submergence conditions. Thereby, seeds treatments with four rice varieties enabled successful to withstand complete submergence compared to control treatments.

Keywords: Artificial seed coating, Direct seeded rice, Local varieties, Priming, Submergence