

Priming Effects on Seed Germination of Tadong Upland Rice Collected in Sabah, Malaysia

ABSTRACT

Rice (*Oryza sativa* L.) is a food crop cultivated worldwide and serves as a staple food for more than half of the world's population. However, the rice production in Malaysia is still unable to reach full sufficiency level and incapable to ensure the national food security as the production levels are still low especially the rice farms in hilly areas. The current self-sufficiency level of rice in Malaysia is 72% and still lacking of 8% from the target of 80% by 2023. Seed priming is one of the techniques to enhance seed performance with respect to uniformity and rate of germination which results better yields in crops. The objective of this research was to determine the priming effects of polyethylene glycol (PEG) 6000 on seed germination of Tadong upland rice. Seed germination of Tadong upland rice was determined under different concentrations of PEG 6000. The experiment was laid out in a completely randomized design with three replications. The priming treatments were five concentrations of 0, -2, -4, -6, and -8 bars using PEG 6000. The data was analyzed using One-way ANOVA and LSD was applied to compare means. The grain size of Tadong upland rice is very long (length of 9.90 mm) and the shape is medium (length/breadth ratio of 2.77). The colour of rice grain with husk is brownish yellow while without husk is reddish black in colour. All the germination traits including germination percentage, germination index, germination rate, mean germination time, germination speed and germination energy showed significant effects among priming concentrations. The highest germination percentage (95.67%), germination index (51.26), germination rate (0.223), germination energy (93.00%) and shortest mean germination time (4.48 days) was found from priming with distilled water (0 bar) but germination speed (100.00%) was found highest when it was treated with -2 bar osmotic potential of PEG 6000. It can be concluded that the higher the PEG concentration (-8 bar), the lower the germination index (35.99), germination rate (0.206), germination speed (94.27%) and germination energy (87.67%) and the longer the mean germination time (4.83 days).