

ABSTRAK

Peanut (*Arachis hypogaea* L.) is one of the important food commodities in Indonesia, with strategic potential for development due to the country's favorable agroclimatic conditions. However, the quality of seeds used by farmers remains low, primarily because they rely on stored seeds from previous harvests. These seeds often suffer from physiological deterioration during storage, leading to reduced viability and vigor. To overcome this issue, seed invigoration techniques such as matricconditioning and osmoconditioning have been developed to improve seed performance before sowing. This study aimed to determine the effect of invigoration techniques and soaking durations on enhancing the viability and vigor of peanut seeds. The research was conducted from March 2025, in Uteun Geulinggang, Dewantara District, North Aceh Regency. A factorial Completely Randomized Design (CRD) was applied, consisting of two factors: (1) invigoration treatments (aquadest, matricconditioning with sawdust, matricconditioning with rice husk charcoal, osmoconditioning with PEG 6000 20%, and osmoconditioning with KNO_3 1%) and (2) soaking durations (10 minutes, 6 hours, and 12 hours), with three replications. Observed variables included germination percentage, maximum growth potential, vigor index, seedling uniformity, growth rate, plumule length, radicle length, and fresh weight. The results showed that both invigoration techniques and soaking durations significantly affected all measured variables. The interaction between both factors also had a significant effect on several parameters, such as vigor index, growth rate, plumule length, and radicle length. The best treatment combination was found in matricconditioning with sawdust for 12 hours, which significantly increased seed viability and vigor compared to the control. These findings suggest that simple invigoration techniques can be effectively applied to improve the physiological quality of peanut seeds prior to planting.

Keywords: Deterioration, KNO_3 , PEG 6000, Rice Husk Charcoal, Sawdust