

Abstract

Beans (*Phaseolus vulgaris* L.) are important legumes in ASALs of South Eastern Kenya. However, lack of uniformity in germination and establishment associated with seed coat permeability and variable soil moisture is a major constraint in their production. An experiment was carried out in a laboratory at South Eastern Kenya University to determine the effects of water imbibitions rate and initial moisture content on germination of selected bean varieties using complete randomized design with three replications. Nine bean genotypes were imbibed in distilled water for 24 hours, wiped between paper towel and allowed to germinate under aerobic conditions and data collected on comparison of the amount of water imbibed by different varieties in different times, effect of maximum water imbibition on germination of different varieties of beans and comparison of germination (days) between imbibed and un-imbibed seeds in different bean varieties. The data was subjected to analysis of variance (ANOVA) using SAS (version 8.0) to detect differences between treatments. Mean separation for significant treatments was carried out using Least Significant Difference (LSD) at $p \leq 0.05$. The results showed that Wairimu, Wairimu dwarf, Piriton and KAT B9, reached their maximum water imbibition levels between 9-12 hrs while KAT X56, GLP 2, KAT B1, Katram and GLP 1004 took 15-21 hrs. Wairimu dwarf, Wairimu, Piriton and KAT B9 took an average of 5 days to germinate while KAT B9, KAT X56, GLP 1004, Katram and KAT B1 took 6.33-6.66 days to germinate. GLP 2, KAT B9, GLP 1004, KAT B9 had the smallest difference of 0.66-1.00 day between the number of days taken by imbibed and un-imbibed bean varieties to germinate. Wairimu, Wairimu dwarf, KAT X56, Katram and Piriton had comparatively a higher difference of 2-4 days between the number of days taken to germinate by imbibed bean varieties and un-imbibed bean varieties. Based on the study, Wairimu dwarf, Wairimu, Piriton and KAT B9 should be considered for planting in arid and semi arid areas of South Eastern Kenya region due to their ability to imbibe water and germinate earlier than other varieties in ASALs where rate of evapotranspiration is high and soils have low organic matter, low moisture retention capacity, and the rains are erratic and minimal.