Abstract

Pigeon pea (Cajanus cajan L.) is a highly nutritious grain legume grown in semi-arid regions, where

drought stress limits seed emergence, growth, and yield. This study determined the effects of drought

stress on growth and yield of pigeon pea under different priming agents. The experiment was

conducted in two dryland locations of Kenya, Kerio Valley and Koibatek, using a Randomized Complete

Block Design split-plot arrangement with three replicates over two seasons. Seeds of Egerton

University Maize Drought Pigeonpea 3 (EUMDP3), Egerton Mbaazi M1, and KAT 60/8 genotypes were

primed with distilled water, 30% Polyethylene Glycol (PEG), 1% potassium nitrate (KNO3), and 300 ppm

Gibberellic acid (GA3), while unprimed seeds served as control. Higher yield, number of branches, and

germination percentage were recorded in Baringo than Kerio Valley. Site × Variety interaction

significantly ($p \leq 0.05$) influenced number of branches and plant height, while Season × Site × Variety

interaction affected plant height. Varietal effects significantly influenced all agronomic parameters.

EUMDP3 showed high yield and stand count, Egerton Mbaazi M1 high branching, and KAT60/8 high

germination, days to flowering, and hundred seed weight (HSW). Kerio Valley had higher stand count,

days to flowering, and plant height, while Baringo recorded higher grain yield. Priming with 1% KNO3

significantly reduced 50% germination time and improved stand count, flowering, branching, HSW, and

yield. Egerton Mbaazi M1 and EUMDP3 performed best in Baringo and Kerio Valley, respectively, with

EUMDP3 showing stable yield across environments and suitability for farmers.