

ABSTRACT

Grain yields of cowpea [*Vigna unguiculata* (L.) Walp.] in the Nigerian savannas are low despite the cultivation of improved accessions. Missing plant stands was suggested to contribute greatly to yield loss in cowpea amongst a host of production constraints. Gap-filling procedures have been adopted as alternatives to manage the occurrence of stand reduction. It is important to evaluate the influence of the reduction in plant density on yield and to understand the mechanism used to compensate for the yield loss. Field experiments were conducted to determine plant density effects on the growth and yield performance of cowpea accessions in IAR research farm, Shika and IITA sub-station, Minjibir and also to identify traits that can compensate for yield in cowpea. A randomised complete block design in a split-plot arrangement with three replications was used. The main plot consisted of four plant densities: T1 (33,333 plants ha⁻¹), T2 (66,666 plants ha⁻¹), T3 (99,999 plants ha⁻¹) and T4 (133,333 plants ha⁻¹) and the sub-plots consists six cowpea accessions (DANILA, IT08K-150-27, IT89KD-288, IT93K-452-1, IT98K-205-8 and IT99K-573-1-1) with contrasting architecture. Plant density and environment had a significant effect on light interception, average pod weight, biological yield and grain yield. Erect cowpea accessions (IT98K-205-8 and IT93K-452-1) performed best at T3 (99,999 plants ha⁻¹), Semi-erect accessions (IT99K-573-1-1 and IT08K-150-27) at T4 (133,333 plants ha⁻¹) and prostrate accessions (DANILA and IT89KD-288) at T2 (66,666 plants ha⁻¹) and T1 (33,333 plants ha⁻¹). Results obtained provide evidence that stand reduction does not contributes to yield loss in cowpea. Grain yield had a significant positive correlation with LAI, IPAR and average pod weight at both environments. This result suggests that these traits may be considered as prime traits to compensate for yield loss in cowpea coupled with the need to ensure cowpea varietal prospects expresses their full seed yield potential at required optimum density.