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Maize-Jackbean Intercrop as Influenced by Different Mixture Proportions and Planting Patterns

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Abstract

Intercropping is attractive to small-scale farmers for efficient growth resource utilisation and risk reduction caused by crop failure in sub-Saharan Africa. Despite the adherence to intercropping, there is a lack of sufficient knowledge of the best planting patterns and intercrop proportions for jackbean in the existing cereal-legume based intercropping. Therefore, this study evaluated the performance of maize-jackbean intercrop as influenced by different mixture proportions and planting patterns. The study was a 4×2 factorial experiment fitted into a Randomised Complete Block Design, with three replicates conducted at the Federal University of Agriculture, Abeokuta in 2015 and 2016. Treatments were Mixture Proportions MP ($\frac{1}{2}:\frac{1}{2}$, $\frac{1}{2}:1$, $1:\frac{1}{2}$ and $1:1$) of maize: jackbean respectively and Planting Patterns PP (alternate single row (ASR) and alternate double row (ADR)). Data collected on growth parameters, yield and yield components of both crops were subjected to Analysis of Variance at 5% probability and means were separated using the LSD. MP ($1:\frac{1}{2}$) significantly increased plant height, leaf area, LAI, the number of leaf and leaf area duration of maize producing a maize grain yield of (3.91 tha^{-1}) and (5.50 tha^{-1}) in 2015 and 2016 respectively. Similarly, growth and seed yield of jackbean were significantly increased with MP ($1:1$) producing the highest jackbean seed yield (0.46 tha^{-1}) and (0.65 tha^{-1}) in both years respectively and MP ($1:\frac{1}{2}$) significantly had the highest LER of 1.42 and 1.02 in both years respectively. ASR increased the growth of maize and had a higher yield (2.48 tha^{-1}) and (4.06 tha^{-1}) in both years compared to ADR. Contrarily, ADR produced higher growth and yield of Jackbean (0.37 tha^{-1} and 0.52 tha^{-1}) in both years respectively. Conclusively, maize-jackbean MP $1:\frac{1}{2}$ ($53,333 \text{ plants/ha}$: $15,015 \text{ plants/ha}$) was appropriate for increased productivity of maize, and the use of the ASR pattern improved the growth and yield of maize in the maize-jackbean intercropping.

Keywords: Intercropping, planting-patterns, sub-Saharan Africa