

Application of rock phosphate levels influenced the root growth, N and P uptake in Bambara groundnut (*Vigna subterranea*) landraces

ABSTRACT

Bambara groundnut production is constrained by inherent low soil phosphorus (P) content and high cost of water-soluble P fertilizers. A screenhouse study on the root growth, N and P uptake of Bambara groundnut was conducted to evaluate the effect of rock phosphate application at The University of Nottingham Malaysia Campus. Treatments consisted of factorial combination of two Bambara groundnut landraces (Kangiwa brown and Kaaro) and four rock phosphate (0, 20, 40 and 60 kg P₂O₅ ha⁻¹) levels. The results revealed that Kaaro landrace was higher than Kangiwa brown in root length, volume, surface area, length volume⁻¹, root dry weight, plant dry weight and N and P content. Application of rock phosphate at 40 kg P₂O₅ ha⁻¹ was optimum in root volume, surface area and root dry weight. However, plant dry weight as well as N, P and ash contents were optimum at 20 kg P₂O₅ ha⁻¹. Thus, rock phosphate could serve as an alternative source of P for Bambara groundnut production in the study area. Application of 20 kg P₂O₅ ha⁻¹ (0.28 g kg⁻¹ of soil) was optimum for the N and P uptake of the crop. Overall Kaaro landrace performed better than Kangiwa brown in the study area.

Keyword: Alternative P source; Nutrients uptake; Root characteristics; Underutilized legume