

Aluminium (Al) toxicity, phosphorus (P) deficiency and low rhizobia populations limit Sesbania (*Sesbania sesban*) performance in tropical acid soils. The study determined the i) indigenous rhizobia populations that nodulate sesbania and ii) effects of lime (0 and 4 t/ha), P-fertilizer (0 and 60 kg/ha) and acid tolerant rhizobia (0 and inoculation) on soil and selected sesbania accessions performance in Western Kenya acid soil. Study site had acid soil, low available P, nitrogen (N) and rhizobia populations that nodulate Sesbania (146 cells/g soil). Lime increased soil pH, while both lime and P-fertilizer increased available P. Aluminium toxicity tolerant and P-efficient accessions (SSBSA004, SSUG3, SSUG4 and SSUG5) had faster growth, higher nodulation, shoot P, and shoot N and response to treatments than the sensitive one (SSBSA203). After 7 months of growth, SSUG3 had highest shoot length (306 cm) and dry matter (5.64 tons/ha), hence, most suitable for building poles and fuel wood. SSUG5 accumulated the highest shoot N (222 kg N/ha) and was therefore, most suitable soil N replenishment. Thus, in acid P deficient and low rhizobial population soils of Western Kenya, the use of lime, P-fertilizer, rhizobia inoculation and Al toxicity tolerant Sesbania are important for Sesbania establishment and growth.