

## Abstract

Field experiments were carried out in Kericho East (0°22' S, 35°17' E) and Bomet central (0°47' S, 35°21' E) to determine the effects of liming and phosphorous (P) fertiliser on nodulation, growth, yield and nutrient content of cowpea in the strongly and moderately acidic soils. The treatments comprised of three cowpea varieties (KVU 27-1, M66 and Ngor) supplied with lime (0 t CaO ha<sup>-1</sup> and 4 t CaO ha<sup>-1</sup>) and P fertiliser (0 kg P ha<sup>-1</sup>, 25 kg P ha<sup>-1</sup> and 50 kg P ha<sup>-1</sup>), laid out in a randomized complete block design in a 2 x 3 x 3 factorial arrangement. Data collected were: nodule number and weight, leaf area index, shoot dry weight, shoot and grain N and P uptake, grain yield, tissue N and protein content. Results showed that liming had no significant ( $P \leq .05$ ) effects on cowpea nodulation at experimental sites characterised by strongly acidic (pH 4.85) and moderately acidic (pH 5.58) soils, but increased shoot dry matter by 35% and grain N and P uptake in the strongly acidic soils of Kericho East by 1.8 kg ha<sup>-1</sup> and 2 kg ha<sup>-1</sup> respectively. In absence of liming or P fertiliser, grain yield was not recorded in two varieties at Kericho East. Application of 50 kg P ha<sup>-1</sup> significantly enhanced nodulation at both experimental sites; it increased nodule dry weight at Bomet Central by 27% in the short rains than in the long rains season. Lower P rate (25 kg ha<sup>-1</sup>) increased shoot dry matter by 46% at Bomet central, but 50 kg P ha<sup>-1</sup> increased growth parameters of cowpea by over 100% at Kericho East in all seasons. It is concluded that liming is not beneficial to cowpea nodulation in soils with similar ecological conditions reported in this study. Application of 50 kg P ha<sup>-1</sup> is required for cowpea production in strongly acidic soils.

Keywords: