

Abstract

Exudation of high amounts of citrate in white lupin (*Lupinus albus* L. cv. *Amiga*) has the advantage of being effective in mobilization of a wide range of sparingly soluble P sources. To improve cultivation system of maize, a field experiment was conducted to assess effectiveness of white lupin (*Lupinus albus* L. cv. *Amiga*) in increasing solubility of minjingu phosphate rock (MPR), phosphorus balances and maize yields in Njoro sub-County, Kenya. The randomized complete block design experiment was conducted for four seasons; short (October – February) and long rain seasons (March-September) of 2010 and 2011. The treatments were; (i) fallow (F) – maize (M) rotation with triple superphosphate (TSP) applied (M_{TSP} - F), (ii) fallow - maize rotation with MPR applied (M_{MPR} -F), (iii) lupin (L) – maize rotation with MPR applied (M_{MPR} - L) and (iv) maize/lupin intercrop with MPR applied (M/L_{MPR} – F). Soil and plant P and maize grain yield were higher in M/L_{MPR} – F (with additional lupin grain yield) and M_{TSP} - F treatments. All treatments resulted in positive P balances at the end of two years with highest values in M_{TSP} - F treatment and lowest in M/L_{MPR} – F. Intercropping lupin with maize amid application of MPR is recommended for enhanced maize performance in the farming systems of resource poor farmers. Measurement of available soil nitrogen and comparison of lupin with other legumes in solubilizing MPR is recommended.