Abstract

Tepary bean (TB), a drought tolerant bean variety has become popular among poor small-scale farmers in semi-arid Kenya, where it is predominantly intercropped with maize. Field experiments were conducted on effect of intercropping TB and maize on nitrogen fixation and crop yield in semi-arid Kenya over two cropping seasons. Experimental design was randomised complete block with eight treatments: TB sole crop not inoculated with Rhizobium (R3254) and without N fertilizer (N), TP sole crop not inoculated with R3254 with or without N, TB sole crop inoculated with R3254 without N, TB with maize intercrop not inoculated with R3254 with or without N and maize sole crop with or without N. Each treatment was replicated four times. Significant differences (P≤ 0.05) were observed in total plant dry weight in treatment R3254 at both 21 and 42 days after emergence (DAE). TB yields were significantly reduced in uninoculated intercrop. Inoculated TB treatments had significantly higher seed dry weights and yields ha⁻¹. Intercropping TB and maize suppresses the yield of the former under semi-arid conditions. Inoculating TB with Rhizobium strain R3254 was infective, effective and significantly improved TB yields in sole and intercrop. Soil analysis after the two cropping seasons indicated enhancement of soil N in sole TB plots above pre-planting levels. Maize plots exhibited a decline in soil N. Total N concentration in plant tissues was significantly enhanced in treatment R3254. There was a marked increase in soil P in all treatment plots following amendment.