

Abstract

A field experiment was conducted at Jomo Kenyatta University of Agriculture and Technology between 2001 and 2002 to determine nitrogen (N) use in maize-pigeon pea intercrop system. Pigeon pea included long duration (erect - and semi-erect) and medium duration types either intercropped with maize (Katumani composite), or as sole crop. Maize, sorghum and cotton, were evaluated as reference crops for biologically fixed N. Plant total nitrogen and soil mineral N at key phenological stages were determined. Maize and sorghum accumulated more shoot dry, mass compared to pigeon pea, hence were unsuitable as reference crops. Cotton had similar growth characteristics and phenological development to the long duration pigeon pea varieties but was unsuitable as reference crop for the medium duration pigeon pea. Long duration cultivars had the highest plant N uptake and contributed high amount of N through litter fall and biological fixation compared to medium duration. Soil mineral N increased over time. Long duration erect pigeon pea had the highest total dry matter and grain yield while medium duration pigeon pea had the lowest. Maize grain yield and total N uptake in subsequent season after pigeon pea was higher in plots that were previously planted with pigeon pea than those planted continuously with maize.