

Abstract

Declining crop productivity is a major challenge facing smallholder farmers in central highlands of Kenya. This decline is caused by continuous cultivation of soils without adequate addition of external inputs in form of manures and fertilizers. With this background, an on-station trial was initiated at Embu in 1992 to evaluate the feasibility of using two leguminous shrubs; *Calliandra calothyrsus* and *Leucaena leucocephala* for improving soil fertility and food production. The results obtained so far indicate that, over the 12 years of study, calliandra biomass transfer with half recommended rate of inorganic fertilizer treatment gave the best average yield of 3.3 Mg/ha followed closely by leucaena biomass transfer with half recommended rate of inorganic fertilizer treatment with an average of 3.2 Mg/ha. However, calliandra alley cropped treatment with prunings removed recorded the lowest maize yield of 1.2 Mg/ha over the same period. Though treatments with calliandra biomass transfer had similar yields compared to those of leucaena biomass transfer, all the treatments that were leucaena alley cropped did better (significantly different) than calliandra alley cropped treatments both with prunings incorporated and prunings removed. This could be attributed to the more intense root competition of calliandra with maize compared to leucaena whose greater percentage of roots are located below the effective rooting zone of the maize crop. Overall, treatments with prunings incorporated with half recommended rate of inorganic fertilizer gave better maize grain yields compared to treatments with only prunings applied.