

Abstract

Maize grain yield is constrained by inadequate supply of nitrogen caused by insufficient application of fertilizers that are found to be costly and unaffordable in smallholder farming. Therefore there is need to search for locally available and potentially low-cost N sources. Beneficial residual effect from mucuna biomass application during subsequent cropping seasons of maize, hence fertilizer saving, is considered one of the possible solutions. However, there are residual aspects of herbaceous legume green manure application that are not clear and warrant further investigation: The application rate of green manure biomass required to make substantial residual effect on yield of maize produced in subsequent cropping seasons is unknown. The effect of mucuna green manure application rate on seasonal persistence of the residual influence is not adequately described. Consequently, on-farm research was carried out in southwest Kenya in the period 2002-2005. The objective was to determine residual effect of mucuna green manure application rate on maize grain yield during the subsequent first and second cropping seasons after incorporation. Treatments investigated were: mucuna green manure applied at rates of 0, 30, 60, 120, 240 and 480 kg N ha⁻¹; and inorganic fertilizer-urea at 30, 60 and 120 kg N ha⁻¹. At tissue N concentration of 1.6 to 2 % for mucuna, the application rates worked to 1.5, 3, 6, 12 and 24 t DM ha⁻¹ equivalent of its green manure biomass. Randomized complete block design with three replications was used and maize variety H614 planted. Data was collected on maize grain yield at harvest. Genstat discovery edition 2 was used in data analysis. Results obtained showed that mucuna green manure and inorganic fertilizer-urea N do not have residual effect on maize grain yield during the first and second subsequent planting seasons, regardless of the rate applied. These being wide range of mucuna application rates, 1.5 to 24 t DM ha⁻¹, would suggest that change in tissue N concentration of the herbaceous legume, while other factors remain similar, would have little if any dramatic alteration on the observed residual response trend.