Abstract

The performance of 14 legume species sown under coffee was studied during the long rains season 2005 in two experimental sites in Kiambu and Murang'a Districts in Central Kenya. Crotalaria Oclroleuca (G.Don) produced the highest biomass at 9 and 10 Weeks After Planting (WAP) on average of 1.5 t ha -1 . By 24 and 29 WAP Desmodium uninatum (Jacq,) DC, Desmodium intortum (Mill.) Urb, Mucuna pruriens (L) DC, Vicia benghalensis L. and Neontonia wightii (Arn.) had the highest biomass on average of 4t ha -1 . Crotalaria Ochloleuca (G.Don) had the highest percentage crop cover (73%) by 9WAP, late maturing and perennial legumes developed cover slowly but maintained the cover longer as compared to the early maturing legumes which developed cover rapidly and dried up in about 100 days after planting. By 24 and 29 WAP Desmodium uncinatum (Jacq,) DC, Mucuna pruriens (L.) DC (mottled) and Desmodium intortum (Mill.) Urb had a percentage crop cover of over 80%. Intercropping with late and maturing LCC reduced weed counts by 369 m -2 at 7 WAP to 52m -2 at 52 WAP. Late maturing legumes like Mucuna pruriens (L.) DC, Desmodium uninatum (Jacq,) DC, Desmodium intortum (Mill.) Urb maintained high ground cover longest and suppressed weeds better than all the other legumes. Desmodium uncinatum (Jacq,), Crotalaria Ochroleuca (G.Don) and Neoutonia wightii (Arn.) extracted the highest soil moisture at all levels tested (0-100 cm) with Mucuna pruriens (L) showing no significant difference from the sole coffee. Mucuna pruriens (L) DC (mottled) recorded the highest litter fall (433 kg ha -1) at 24 WAP while Neontonia wightii (Arn) recorded the lowest (115 kg ha -1) in same period. Introduction Coffee is the world's second most traded commodity in terms of value after petroleum. In Kenya it contributes significantly to the economy in terms of foreign exchange earnings. It contributed 1.8 % to the gross domestic product in 1999 and about 10% of total foreign exchange earnings (CBK, 2005). Currently coffee is ranked fourth after tea, tourism and horticulture. All Kenya coffee is of the Arabica spp. grown on the rich volcanic soils in the highlands of Kenya. It is grown on both large-scale commercial farms/estates (greater than 2 ha) and small-scale holders farms (cooperatives) (less than 2 t ha -1). The estates and cooperatives both account for about 33 and 67% of the total area under coffee respectively (CBK, 2003a). Smallholder farms contribute 76% of the total coffee produced and approximately 60% of the total national clean coffee (Anon, 1999). The average national coffee yields have declined by 60% over the last 40 years due to low coffee prices and high cost of inputs (fertilizers, pesticides and labour) (FAOSTAT, 2004; Anon, 1999). The unit

cost of labour, fertilizer and fungicides increased by 430%, 599% and 400% respectively between 1986 and 1998, labour, fertilizer and fungicide costs comprised 15%, 11% and 16% of the production costs respectively (Anon 1999). Smallholders produce much less per unit area compared to the estates, i.e. in 1993/94 cooperatives registered average yields of 342.7 kg ha -1 compared to 1,012.6kg ha -1 produced by the estates (Ministry of Agriculture and Livestock Development, 1996). Today the average production is much lower compared to previous years with cooperatives producing 200 kg ha -1 and estates 700 kg ha -1 of coffee respectively (CBK, 2003b). Due to these declining trends, majority of the smallholder farmers have resorted intercropping coffee with food/forage crops to maximise on profitability per unit area land and this has lead to soil nutrient mining and poor husbandry practices. As a result the soils in most of these smallholder coffee cropping areas are highly eroded and infertile leading to low coffee and food production. This has resulted in high poverty levels, food insecurity and unemployment.