

We established hedges/barriers of calliandra (*Calliandra calothyrsus* Meissner), leucaena (*Leucaena trichandra* (Zucc.) Urban)) and napier grass (*Pennisetum purpureum* Schumach) and combination hedges of either calliandra or leucaena with napier grass on slopes exceeding 5% to study the effect of vegetative barriers on productivity of arable steep-lands in central Kenya. Hedges/barriers were pruned regularly and biomass incorporated into the plots. Hedge plots were monitored for soil fertility, soil losses and maize crop yield changes. Inorganic-N concentration in the tree hedge plots was higher than in the control and napier barrier plots after 20 months. Napier grass barriers were the most effective in reducing erosion losses across the two seasons. The effectiveness of napier grass to significantly reduce soil erosion was detectable in one year old napier barriers. Soil loss from all the other one year old vegetative treatments was similar to soil loss from the control. Seventeen month old combination hedge plots recorded lower soil losses than tree hedges of the same age ($P = 0.012$). Maize crop yields throughout the trial period were high and similar for leguminous and combination hedge plots, but lower in the napier grass and control plots. Overall, we observed that the combination hedges seemed to provide a win-win scenario of reduction in soil erosion combined with improvement of maize crop yields and soil fertility enhancement. We conclude that vegetative hedges have a potential for improving soil productivity in arable steep-lands of the central highlands of Kenya, and that in adoption of vegetative hedges for this purpose there are trade-offs between soil conservation, soil fertility and maize crop yields to be considered.