

ABSTRACT

Alley cropping on terraces was compared with traditional open land cultivation at the Research Farm, Girandurukotte, over three seasons. Rainfed cowpea, black gram and sesame were planted in yala and maize and cowpea were planted in maha.

Yala (1986 and 1987) crop performance was poor; drought reduced field establishment and growth and increased plant mortality. Crops grown in alleys, however, had better ($P=0.05$) field emergence (73% versus 45% in the open), lower plant mortality (25% vs. 41%), more rapid growth and greater yield (cowpea 515, black gram 397 and sesame 311 kg ha⁻¹) compared with the crops in bare land (282, 273 and 226 kg ha⁻¹). This was attributed to reduced soil (up to 7.5°C) and air (6°C) temperatures, higher relative humidity (by up to 14%), improved soil moisture retention (up to 28 mm in the top 40 cm), greater organic matter content (by 40%) and soil nitrogen (by 20%) under the avenues.

Due to adequate rains maha field emergence, crop growth and yield differences between alley cropped and open tracts were non significant ($P=0.05$). Mulch from loppings improved the soil and crop yield (maize by 10% and cowpea by 20%) under the hedgerows. There were also no yield differences ($P=0.05$) between untilled and minimum tilled plots, however the former had an excessive weeding requirement due to presence of pernicious perennials (Imperata cylindrica, Mimosa pudica and Commelina spp.), though weed weights were lower by almost 60% in the alleys.

Sesame Web Worm (Antigastra catelannalis), Bean Fly (Ophiomyia phaseoli), Pod Borer (Maruca testulalis), Cutworm (Spodoptera littura), rabbits and lizards caused greater damage under the avenues.

The maintenance requirement of the Leucaena cultivar was excessive due to prolific growth of volunteer plants.