ALLEY CROPPING WITH GLIRICIDIA AND LEUCAENA IN THE INTERMEDIATE ZONE OF SRI LANKA

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ABSTRACT

Alley cropping is considered to be capable of maintaining sustained production, while minimising the depletion of natural resources and use of high cost inputs. Hence, these systems have a potential of solving major farming constraints in rainfed uplands of Sri Lanka. Alley cropping, however is not common among local farmers at the present time. This could be attributed to the lack of knowledge of the technical aspects and benefits of this system.

The objective of this study was to evaluate the benefits accrued to the common agricultural systems of the intermediate zone of Sri Lanka through integration of tree legumes. Gliricidia sepium and Leucaena leucocephala (var.K8) were the selected leguminous trees for alley cropping. The study evaluated the production of green manure, its nutrient contents and fuelwood by the selected tree species and the impact of their roots on annual food crops. In addition, productivity of some annual food crops and their mixtures under alley cropping, was studied along with changes in organic matter and total nitrogen content of soils in Gliricidia and Leucaena alleys.

Gliricidia produced large quantities of green manure and added significant amounts of nutrients to the alleys through loppings. The low biomass production of Leucaena was due to the damage caused by the psyllid, Heteropsylla cubana.

The results also showed a greater root mass of Gliricidia in the alleys. This could have imposed a greater degree of root competition on associated food crops than Leucaena.

Organic matter and the total nitrogen contents of soils in alleys was increased

through the addition of loppings from tree species. The above increases were significantly greater in the Gliricidia alleys due to the addition of more leaves.

Alley cropped plots always produced higher yields of food crops when compared to open cropping. Some crops showed greater advantages under alley cropping in certain seasons by producing higher yields. Other species produced similar yields in both Yala and Maha seasons. Generally, the yields in Maha seasons were higher than in Yala seasons.

A significant variation was observed among LER values computed for intercrops under the alleys. Therefore, careful selection of intercrops is necessary to optimise production.

This research project, conducted over three years, clearly illustrates that alley cropping is capable of producing substantial yields in contrast to normal cropping systems of the region. This suggests that alley cropping is promising for this location and similar environments in the mid country intermediate zone of Sri Lanka.