

SHORT-TERM IMPROVED FALLOW USING FOREST AND MULTIPURPOSE TREE SPECIES AS A SOLUTION FOR SOIL DEGRADATION IN COCONUT PLANTATIONS

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This study was designed to investigate the possibility of improving degraded soils due to long-term cultivation of coconut, though short/medium term improved fallow, in addition, to screen out the effective perennial species in revitalizing the soil properties. The experiment was conducted as a part of an ongoing research, in Rathmalagara estate, Madampe belongs to *Andigama* soil series in low country intermediate zone (IL, agro-ecological region) including eight forest tree species namely *Acacia auriculiformis* (Acacia), *Calophyllum elatum* (Domba), *Macaranga paltata* (Khanda), *Acacia mangium* (Acacia), *Gliricidia sepium* (Gliricidia), *Swietenia macrohylla* (Mahogani), *Bridelia moonii* (Ketakala), *Tectonia grandis* (Teak). Soil physical, chemical and microbiological properties were determined in surface and sub-surface soil to compare the effectiveness of eight tree species. Results showed the potential of perennial tree species on soil organic matter (SOM) accumulation, indicated by the significantly ($p < 0.05$) higher mean differences (1.12%) of SOM compared to control (0.22%). Highest SOM content (1.86 %) was observed in *G. sepium* planted plots. Soil total nitrogen (TN) content was higher in plots with legume trees compared to non legume trees, while highest TN (1.48 g.kg⁻¹) was in *A.auriculiformis* plots. Exchangeable potassium was significantly low in plots with perennial trees compared to control. Significantly high microbiological activities confirmed the symbiotic association of tree species and soil microbes, and highest activity (128.5 CO₂ μg g⁻¹ soil day⁻¹) was observed in *A. auriculiformis* plots. These findings may be the first that provide preliminary evidence for *Andigama* soil series that confirms the effectiveness of *A. auriculiformis* and *G. Sepium* in revitalizing the soil properties of degraded coconut lands using improved fallows.

Key words: *A. auriculiformis*, Coconut, Forest plant species, *G.sepium*, Improved fallows, Soil degradation,