

IMPROVEMENT OF SOIL CHARACTERISTICS UNDER CROP - STOCK INTEGRATION

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Soil characteristics and vegetation properties of Diggassawela farm belong to Diddenipotha plantation Limited (approximately 10 km from Kamburupitiya) was studied in view of evaluating the impact of crop - stock long term integration. Crop - stock integration has been practiced in this farm for more than a decade. Compost and farmyard waste were intensively used for tea replanting purposes and pasture cultivation respectively. Soil samples were collected randomly from (3 replicate/location) cattle courtyard, pasture land and compared with an abandoned tea land soil in the same area.

The soil pH ranged from 8.06 for pastureland and 4.53 for an abandoned tea land ($P < 0.05$). Moisture content of the soil was highest in pastureland (19.7%) while the lowest value was observed in the abandoned tea land (8.63%). Pastureland soil had the highest porosity (52.63%) with the lowest bulk density (1.13 g/cm^3). In contrast the abandoned tea land soil had the lowest porosity (42.04%) with the highest bulk density (1.54 g/cm^3) due to its high clay percentage. True density of pasture land soil, cattle court yard soil and eroded tea land soil were 2.20 g/cm^3 , 2.25 g/cm^3 and 2.48 g/cm^3 respectively ($P > 0.05$). The soil characteristics of pastureland compared with other two sites shows improvement due to nutrient recycling via dairy washings and litter accumulation.

The observations also revealed that the grass yield and longevity of the pastures and fodder were improved significantly with application of farmyard waste. Application of compost also improved the soil properties and increased the rate of survival of tea plants (replanting).

The results suggest that the waste materials such as excreta, residues of feeding materials, bedding and dairy washings thus produced various benefits with passage of time and demonstrated potential for the sustainability of a crop - livestock integration system. It is suggested that crop - livestock integration could be successfully used for the rehabilitation of tea lands on a long-term basis.