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Correlation of physico-chemical characteristics of barren and cultivated lands at Thamaraikulam

Y. YESU THANGAM, M.A. SABITHA, M. MUTHULAKSHMI **AND** S.NATHIYA

ABSTRACT

Soil samples from barren and cultivated lands were collected from Thamaraikulam, Tamilnadu, and analyzed for various soil parameters for a period of twelve months in order to understand the effect of cultivation on soil properties. The values of pH, soil moisture content and ammonium-nitrogen were optimum for barren land providing suitable condition for better yield of crops. The values of correlation coefficient for all possible correlations among soil parameters were computed (range of r = -0.917 to 0.988). Highly significant correlation between various parameters like salinity and pH, calcium and soil moisture content for barren land, salinity and pH, calcium and salinity for cultivated land were reported. The correlations provide an excellent tool for the prediction of parameter values. It was determined that the long-term continuous cultivation has changed the characteristics of the soil.

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Key words : Soil parameters, Ammonium-nitrogen, Nitrate-nitrogen, Correlation coefficient.

INTRODUCTION

Soil is the natural covering on most of the earth's land surface. Soil is the mixture of organic and inorganic materials. The organic part consists of living things and their remains while the inorganic part is made up of rocks and minerals. The characteristics of the soil are undergoing continual changes and the rates of these changes are highly dependent on the type and density of vegetations. The effects of cropping systems and management practices on soil properties provide essential information for assessing sustainability and environmental impact (Ishaq and Lal, 2002). In addition, many researchers reported that change of land use, implemented locally, such as long term cultivation, could cause significant variations in soil properties (Conant *et al.*, 2003; Tate *et al.*, 2004; Fraterrigo *et al.*, 2005; Hacisalihoglu, 2007; Saraswathy *et al.*, 2007).

The types of plants present in an area have a great impact on the quality of soil of that area as the plants and soil are strongly influenced by each other. Many soils do not have high degree of natural fertility for plant crops. Long period of cropping without the addition of nutrients can impoverish a soil.

Sampling Station:

Description of the study area:

The study was carried out at Thamaraikulam, Tamil Nadu, during 2009-2010. Thamaraikulam is situated in Theni District, nestling in lush green area facing the imposing Kodaikanal hills, which is 2 km away to the west of Periyakulam. During summer, the temperature varies from a maximum of 37.1^{0}C to minimum of 25.0^{0}C and during winter, the temperature changes from a maximum of 27.0^{0}C to a minimum of 20^{0}C.

MATERIALS AND METHODS

Cultivated and barren lands were selected for the present study. Barren land was comprised of uncultivated soil where as cultivated land consisted of periodically cultivated soil.

Correspondence to :
Y. YESU THANGAM, Jayaraj Annapackiam College for Women (Autonomous), PERIYAKULAM (T.N.) INDIA
Email: sryesu@gmail.com

Authors' affiliations:
M.A. SABITHA, **M. MUTHULAKSHMI AND S. NATHIYA**, Jayaraj Annapackiam College for Women (Autonomous), PERIYAKULAM (T.N.) INDIA