

## Groundnut cultivation using theri soil in Tamil Nadu by organic amendment and enhancement of its physical properties

F. JEYAMANGALAM\*, B. ANNADURAI<sup>1</sup> AND N. ARUNACHALAM<sup>2</sup>

Department of Physics, Manonmaniam Sundaranar University,  
TIRUNELVELI (T.N.) INDIA. E-mail: f.jeyamangalam@yahoo.com

### ABSTRACT

Biometric measurements were carried out in a field experiment at Puchikadu village in Thuthukudi district of Tamil Nadu, South India. The effect of different organic amendments and their combination on growth parameters and favourable change in physical properties were evaluated. The treatments of this study were farm yard manure (FYM), composted coir pith (CP) and tank silt (TS). The experiment was laid out in Randomized Block Design with three replications. All the amendments were applied after 30 days of irrigation. The soil samples were collected in each plot and analyzed. Groundnuts were grown and the soil was again analyzed after the harvest of the crop. The yield of pods was high with the combination of composted coir pith and tank silt in equal combinations with 12.5 t ha<sup>-1</sup> which was 40.51% higher than control. The biometric observations like height, number of branches and leaves, dry biomass and yield of the plants were taken. The bulk density (BD) and particle density (PD) had negative effect. Percentage of water holding capacity (WHC), pore space (PS) and saturated moisture (SM) had positive effect. Thus organic farming is not a destination to reach, but it is a journey to a mission in ameliorating the soil.

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### INTRODUCTION

Theri soil, a typical red sand dune soil occurs on an area of 11,000 ha in Tamil Nadu, which is presently considered as wasteland. This sand dune ecosystem is formed as sand deposits under a semi arid climate. As the soil texture is sandy, it is subjected to severe wind erosion and characterized with poor nutrient status. Water holding capacity of the soil is very low owing to the low clay content as explained by Rakesh *et al.* (1998). Walia *et al.* (1999) put forth poor organic carbon content and single grain structure.

Organic farming conserves soil fertility and prevents soil erosion through implementation of appropriate conservation principles which leads to live in harmony with nature. Organic farming is a method of farming which avoids or largely excludes the use of harmful chemicals such as chemical fertilizers, pesticides and herbicides and use of natural resources such as organic matter, minerals and microbes to maintain the environment clean without polluting soil, water and air.

The farm yard manure seems to act directly by increasing crop yields either by acceleration of respiratory process by cell permeability or by hormone growth action.

It supplies nitrogen, phosphorus and sulphur in available forms to the plants through biological decomposition. Indirectly, it improves physical properties of soil such as aggregation, aeration, permeability and water holding capacity as experimented by Malathesh (2005).

Coir is the name given to the fibrous material that constitutes the thick mesocarp (middle layer) of the coconut fruit (*Cocos nucifera*). The short fibers (10 mm or less) and dust (collectively referred to herein as "pith") traditionally have accumulated in large piles or dumps as a waste product resulting from the processing of coconut husks to obtain the industrially valuable long fibers. Coconut coir pith has many physical and horticultural characteristics that make it an excellent growing medium for plants. It has high water holding capacity, ideal porosity, high cation exchange capacity and high stability (US.2009/0113791 A1).

Tanks serve as a good trap for eroded soil generating large quantities of accumulated sediment. Invariably tank sediments have higher nutritive value over their respective cultivated catchment soil (Anonymous, 2003). Addition of tank sediments to cultivated fields improves the physico-chemical properties of the soil which results in good crop growth and higher yields.

\* Author for correspondence.

<sup>1</sup> Department of Physics, Aditanar College of Arts and Science, TIRUCHENDUR (T.N.) INDIA

<sup>2</sup> Department of Physics, Manonmaniam Sundaranar University, TIRUNELVELI (T.N.) INDIA