RESEARCH PAPER *Asian Science* (June & December, 2011) Vol. 6 Issue 1 & 2 : 35-40

Evaluation of organic amendments using FYM for the improvement of physical properties of theri soil in Tamil Nadu, India

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ABSTRACT

A field experiment was conducted at Poochikadu village in Thuthukudi District of Tamil Nadu, South India to evaluate the effect of different organic amendments and their combinations on various physico-chemical and physical properties on theri soil and the resultant impact on groundnut crop. 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 (RBD) with three replications. All the amendments were applied and after 30 days of drip 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 F+CP in equal combinations with 12.5 t ha^{-1} which was 36.67 per cent higher than control. The pH, electrical conductivity (EC), bulk density (BD) and particle density (PD) had decreased in all plots other than control. NPK content, percentage of water holding capacity (WHC), pore space (PS) saturated moisture (SM), organic carbon (OC) content and organic matter (OM) had increased. Thus, application of amendments in the proper combination may be a good strategy to reclaim the theri soils.

Jeyamangalam, F., Annadurai, B. and Arunachalam, N. (2011). Evaluation of organic amendments using FYM for the improvement of physical properties of theri soil in Tamil Nadu, South India. *Asian Sci.*, **6**(1 & 2): 35-40.

Key Words : Farm Yard manure, Amendment, Physical properties, Reclamation

INTRODUCTION

Red sandy dunal soil of Tamil Nadu is called Theri soil. The colour span of theri soils are due to the iron compounds present and the aerobic conditions prevailing confirm the occurrence of haematite mineral in the soil. Haematite is in a very fine dust form to adhere on the soil particles uniformly (Subramanian, 2004). The theri soils are made up of deep sand zones. The permeability of water is high. So it is not suitable for agriculture. It faces higher level of soil erosion. It has low nutrients and minerals. Its water holding capacity is less. They are susceptible to wind erosion. Theries have a semi-arid tropical climate. The mean annual rainfall of the area is between 610 to 700 mm (Jawahar *et al*., 1999 a). The Indian soils have rapidly degraded nutrients in their nutrient status Motsara (2002) estimated that 90 per cent of the soils are presently deficient in available N, 80 per centin P and 50 per cent in K. It is realized that organic manures are the vital sources to sustain the microbial activity and improved the physical constituents of the soil while they can partly substitute the requirement of N, P and K fertilizers.

Tanks ensure equity, groundwater sustainability, trap valuable sediment for recycling and thus, play an important role in enhancing productivity and profitability from rain-fed agriculture (Mohammed Osman, 2008). Organic matter increases biological activity. Therefore, to improve the overall biological, chemical and physical conditions of the dry land soils, regular addition of organic material would be beneficial (Barzegar *et al*. 2002).

The groundnut which is also popularly known as peanut is one of the world's most popular and universal crops, cultivated in more than 100 countries on six continents. China and India are the largest producers of groundnut. Among different states producing groundnut, Tamil Nadu tops the list with 1500 kg ha^{-1}, which is half quintal more than the all India average (Patil.*et al*. 2009).

Coir pith has gained importance owing to its properties for use as a growth medium in horticulture. Because of wider carbon and nitrogen ratio and lower biodegradability due to high lignin content, coir pith is still not considered as a good carbon source for use in agriculture. Coir pith is composted to reduce the wider C: N ratio, reduce the lignin and cellulose content and also to increase the manorial value of pith. Composting of coir pith reduces its bulkiness and converts plant nutrients to the available form.

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