

Influence of distillery spentwash on the physico – chemical properties of calcareous sodic soil (*Calcic natrustalfts*)

B. BAKIYATHU SALIHA* AND M.I. MANIVANNAN

Dept. of Fruit Crops And Post Harvest Technology, Horticultural College and Research Institute, PERIYAKULAM (T.N.) INDIA

(Accepted : February, 2008)

Spentwash is an acidic liquid, rich in organic carbon, Ca, Mg, S and K with considerable amounts of N, P and micronutrients. The composition of spentwash indicated the scope of utilizing it as an amendment for the reclamation of sodic soil and as a cheaper source of plant nutrients. An incubation study was conducted to assess the changes brought in the properties of soil after the application of spentwash at 0, 55, 110 and 225 ml kg⁻¹ soil. The samples were analysed for various physico chemical properties such as pH, EC, CaCO₃, CEC, ESP, SAR and inorganic carbon contents. Application of spentwash @ 55, 110 and 225 ml kg⁻¹ soil were found equally effective in reducing the pH of air dried soil to = 8.3 during the incubation period of 60 days. The EC increased progressively and significantly with increasing rates of spentwash application. The ESP decreased from 32.3 to < 14 and SAR from 11.7 to < 8.0 for all the levels of spentwash. The addition of organic matter through spentwash enhanced the organic carbon content of the soil from 0.24 per cent to 0.62 per cent thus increasing the availability of nutrients to the soil.

Key Words: Spentwash, pH, EC, CaCO₃, dsp, SAR, Organic carbon

INTRODUCTION

During the recent years, India has emerged as the largest sugar producer of the world. Molasses, one of the byproducts of sugar industry is used for producing alcohol. There are 285 distilleries in India producing 2.7 billion litres of alcohol annually and generating about 40 billion litres of spentwash (Joshi *et al.* 1996). The spentwash which is a waste byproduct of distilleries is a dark brown coloured liquid with unpleasant odour of burnt sugars. It is acidic and highly saline with high BOD, COD, total solids, and other organic compounds like phenols, lignin, oil and greases. Besides, spentwash also contains large amounts of organic carbon, K, Ca, Mg and S and moderate levels of N and P and small quantities of Fe, Mn, Zn and Cu. Since spentwash is an acidic liquid with acid forming character and contains considerable quantities of Ca and Mg, it could be used as a good ameliorant for reclaiming sodic soil besides its usage for the preparation of biocompost using pressmud. At the same time, indiscriminate use and injudicious application of spentwash will affect the soil health and crop growth. With this background in view, a preliminary laboratory incubation study was undertaken to assess the impact of spentwash on the physico chemical properties of calcareous sodic soil besides improving its fertility status.

MATERIALS AND METHODS

Processed soil samples 500 g each were taken in 400 cm³ plastic cups and the spentwash at the rate of 0, 55, 110, 225 ml kg⁻¹ soil equivalent to one time application of 0, 125, 250 and 500 m³ spentwash ha⁻¹, respectively was added and thoroughly mixed with the soil. Wherever necessary, required quantity of distilled water was added to the soils to attain a final moisture content equivalent to field capacity. The moisture content was corrected at weekly intervals and maintained through out the incubation period. The plastic cups were covered with plastic lids containing small pin-sized holes to permit aeration. Four replicates of each treatment were prepared, randomly placed in tray and kept in the laboratory at 25±2°C for 60 days. Initially and on 15th, 30th, 45th and 60th days of incubation sub samples were removed from each replication and the fresh samples were used for chemical analysis. Moisture factor was computed and applied to express the results on oven-dry basis. The details of the incubation study are presented below:

Treatments :

Factor A - *Levels of spentwash

- S₀ - No spentwash
- S₁ - Spentwash @ 55 ml kg⁻¹ soil
- S₂ - Spentwash @ 110 ml kg⁻¹ soil

* Author for Correspondence