



Effect of industrial sludges and soil conditioners on physical properties of loamy sand soil

N.H. DESAI, N.J. JADAV AND C.L. PATEL

ABSTRACT

Laboratory experiment was conducted to find out the effect of different sludges and soil conditioners viz., FYM(FYM10,FYM20), private farm manure (PFM10,FPM20), vermi compost (VC10,VC20), coir pith (CP10,CP20), fly ash (FA10,FA20), ETP sludge(ETP10, ETP20) ammonium chloride sludge (ACS10, ACS20) and glycerin sludge (GS10,GS20) @ 10 and 20 t ha⁻¹ along with control on soil water diffusivity, moisture content as a function of drying period from saturation to dryness and soil water retention characteristic. Irrespective of sludges and soil conditioners, higher water content was recorded at initial segments of plexiglass columns as compared to later one. However, the soil water diffusivity was progressively decreased from inlet to lateral segments. A given segment of column, incorporation of fly ash @ 20 t ha⁻¹ recorded higher water content as well as soil water diffusivity followed by VC20, CP20, PFM20, FYM10, PFM10, FYM20 and control under uniform bulk density at 1.50 Mg m⁻³. Among different sludges and soil conditioners, incorporation of ETP sludge @ 20 t ha⁻¹ recorded higher moisture content even after 5th days of incubation. Similarly, recorded maximum moisture content at all soil water potentials was noticed with ETP sludge. The moisture content was decreased with the increasing period of incubation. The moisture content under all the treatments was decreased with decrease in soil water potentials from -33, -100, -300 and -1500 MPa. Control plots registered higher soil bulk density and infiltration rate as compared to rest of the treatments except glycerin sludge. Incorporation of ETP sludge @ 20 t ha⁻¹ was found significantly superior over rest of the treatments with respect to moisture content in soil during crop growth.

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INTRODUCTION

Soil fertility and productivity have to be restored and maintained at a high level to ensure continuous growth in agriculture. Agriculture, devoid of recycled organic manure/ crop residues is facing disorder in physico-chemical and biological properties of the soil. Sustainability of soil fertility and a steady increase in crop productivity need to be given priority to meet national food and nutritional security. Soil amendments/ reclamation measures have to be simultaneously popularized. A check on further deterioration in soil fertility is critical and improvement of physical and biological properties of the

soil coupled with a balance in the nutrient content in the soil alone can assure sustained crop production (Rawat, 2002). The organic manures ,industrial sludges and soil conditioners supply essential nutrients and improve properties of soils and very often leave substantial residual fertility effect on succeeding crop (Hangarge *et al.*, 2004).

MATERIALS AND METHODS

A field experiment was conducted at Department of Ag. Chemistry and soil science, C. P. College of Agriculture, S. D. Agricultural University (erstwhile G.A.U.), Sardarkrushinagar during the year of 2002 - 2003

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