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Research Article

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Yield and nutrient uptake under wheat-pearl millet-green gram cropping system as influenced by industrial sludges and soil conditioners

N.H. DESAI, N.J. JADHAV AND D.M. PATEL

ABSTRACT

A field experiment was conducted during 2002-03 at Agronomy Instructional Farm, Sardarkrushinagar to study the effect of industrial sludges and soil conditioners on seed yield and nutrient uptake of N, P and K under wheat-pearl millet-green gram cropping system. Application of ETP sludge @ 20 t ha⁻¹ to wheat crop resulted in significantly higher grain yield of wheat, pearl millet and green gram crops raised in sequence than control. GS20, ACS20, GS20, ACS10, FA10, FA20, VC10 and FYM10 treatments. Different sludges and soil conditioners enhanced uptake of N, P and K by grain as well as straw and followed the order of ETP sludge> private farm manure> FYM> vermicompost >fly ash > coir pith >control> ammonium chloride sludge > glycerin sludge in case of wheat crop (first crop in sequence); whereas ETP sludge > private farm manure> farm yard manure > vermicompost > fly ash > coir pith> ammonium chloride sludge > glycerin sludge > control in case of bajra and green gram crop (second and third crop in sequence)

KEY WORDS : Industrial sludge, Soil conditioner, Nutrient, Uptake and yield

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INTRODUCTION

Rapid expansion of industrialization, colossal amount of solid wastes are given out everyday and disposed off safely to save the environment. Industrial wastes are relatively more hazardous to the environment. However, it is not always true that all industrial wastes are pollutants. There are some industrial wastes containing manurial as well as ameliorative elements in appreciable quantities. This would solve the twin problem of disposal and also substitute some quantities of fertilizers.

Recycling of organic waste through vermicompost and ordinary composting (FYM) helps to minimize environment pollution and also improve their manurial value for agriculture. These soil conditioners supply both macro and micronutrients and improve physical, chemical and biological properties of the soils. These manures very often leave substantial residual fertility effect on succeeding crop.

Thus, there is a great potential and large scope for

Correspondence to:

N.H. DESAI, Centre for Agro Forestry, Forage Crops Green Belt, S.D. Agricultural University, SARDARKRUSHINAGAR (GUJARAT), INDIA

Authors' affiliations:

eco-friendly management of industrial wastes and soil conditioners. Keeping this in view, present investigation pertaining to use of some industrial solid wastes and soil conditioners on productivity under wheat-pearl milletgreen gram cropping system was carried out.

MATERIALS AND METHODS

The field experiments were conducted at the Agronomy Instructional Farm, C. P. College of Agriculture, S.D. Agricultural University, Sardarkrushinagar during winter (Rabi), hot weather (summer) and rainy (Kharif) seasons during 2002-03. The soil was loamy sand with 7.52 pH, low in organic carbon (0.23 %) and available nitrogen (167 kg ha⁻¹) and medium in available P_2O_5 (46 kg ha⁻¹) and available K₂O (180 kg ha⁻¹). Each industrial sludge and soil conditioner comprised of two levels (10 and 20 t ha⁻¹.) treatments including absolute control. The experiment consisted of seventeen treatments viz., FYM10: FYM 10 t ha⁻¹, FYM20: FYM 20 t ha⁻¹, PFM10: Private firm manure 10 t ha-1, PFM20: Private firm manure 20 t ha-1, CP10: Coir pith @ 10 t ha-1, CP20: Coir pith @ 20 t ha⁻¹, VC10: Vermicompost @ 10 t ha⁻¹, VC20: Vermicompost @ 20 t ha-1 ,ETP10: ETP sludge @ 10 t ha⁻¹, ETP20: ETP sludge @ 20 t ha⁻¹, FA10: Fly ash @ 10 t ha-1, FA20: Fly ash @ 20 t ha-1, ACS10: Ammonium chloride sludge @ 10 t ha-1, ACS20: Ammonium chloride

N.J. JADHAV AND D.M. PATEL, Department of Agricultural Chemistry and Soil Science, C.P. College of Agriculture, S.D. Agricultural University, SARDARKRUSHINAGAR (GUJARAT), INDIA