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DEHYDROGENASE ENZYME ACTIVITY OF NORMAL, SALINE AND ALKALI SOILS UNDER DIFFERENT CROPPING SYSTEMS

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ABSTRACT

Dehydrogenase activitywas measured in normal soils having pH 7.0 to 8.5 and EC 0.9 to 2.9dS m^{-1}; alkali soil having pH 8.5 to 9.2 and EC 1.8dS $m^{-1}$and in saline soil having pH 7.7 to 7.8 and EC 4.3 to 7.0 dsm^{-1} under different cropping systems. Dehydrogenase activity in normal soil was 50% more under trees compared to rice-wheat cropping system. Whereas in saline soil it was more underbajra-wheat cropping system than under trees. In alkali soils dehydrogenase enzyme was maximum underjungleekikar, rice-wheat and followed by Eucalyptus. When dehydrogenase activity was compared for barren soil at all the sites, it was 30.05ìg TPF g^{-1} soil in the normal soil under Halfa grass, 1.44 to34.57ìg TPF g^{-1} soil in alkali soil and 0.00 to 80.18ìg TPF g^{-1} soil in saline soil. Average dehydrogenase was 40.56, 39.95 and 12.50 TPF g^{-1} soil for normal, saline and alkali soil, respectively. Dehydrogenase activity was almost same for saline and normal soils whereas, alkali soils showed minimum dehydrogenase enzyme activity.

Key words : Normal soil, Saline soil, Alkali soil, Cropping system, Dehydrogenase activity.

INTRODUCTION

Enzymatic activity of soils influenced by its physico-chemical characteristics and agricultural management practices. Dehydrogenase enzyme activity provides correlation between microbial population and biological activity (Skujins, 1973). Characteristics such as soil microbial biomass, soil enzymes and respiration respond quickly to changes in cop management practices and type of cultivation than physico-chemical properties of soil (McGill *et al*., 1986; Rao *et al*., 1990; Fromm *et al*., 1993; Chander *et al*., 1997). Permanent vegetation such as trees and grasses causes an increase in dehydrogenase activity as compared to annual crops (Rao and Gill, 1985). For highly deteriorated alkali soil, dehydrogenase activity was greater in rice-based cropping sequence than sorghum-based cropping sequence (Batra, 1998). Keeping this in mind the present study was undertaking to compare the dehydrogenase activity of normal, saline and alkali soils and correlate them with physico-chemical properties of soil with crops under different cropping systems.

MATERIALS AND METHODS

Soil samples were collected from three Tahsils of Muzaffarnagar distt. of Western U. P. Normal soils from Budhana Tehsil, saline soil from kairana Tehsil and alkali soil from Jansath Tehsil. Soil at Kairana is sandy loam, Typicnatrustalf at Budhana the soil is normal and at Jansath soil is typical alkaline and water logged generally classified as calciorthid. The soil samples were collected in January, 2007 under different agricultural management practices *i.e.* trees, grasses and annual crops. At Budhana and Kairana soil samples were also collected from typical