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EFFECT OF FLY ASH ON CROP YIELD AND PHYSICO-CHEMICAL, MICROBIAL AND ENZYME ACTIVITIES OF SODIC SOILS

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Abstract

Safe utilization of fly ash (FA) and reclamation of sodic soils are important environmental problems. In this study a field experiment was carried out with *Vigna radiata* L. crop using fly ash (FA) and phosphogypsum (PGY) as amendments in sodic soil during 2011 at Lucknow, Uttar Pradesh, India. *V. radiata* L. was sown in sodic soil amended with press mud (10 t ha⁻¹) considered as control. Besides, 10 and 20 t ha⁻¹ doses of FA and PGY were considered as other four treatments, respectively. The growth variables such as survival, root-shoot length, biomass production, number of pods and nodules were significantly higher in soil treated with 20 t ha⁻¹ FA. Physico-chemical, biological and biochemical properties were analysed at the time of harvest. Our results showed that FA improves soil physical properties to a greater extent in comparison to PGY. However, pH and electrical conductivity showed adverse pattern, but soil organic carbon, nitrogen, microbial biomass (MB) and population of bacteria and earthworms were highest in the soils amended with 20 t ha⁻¹ FA. The population of fungi was unaffected through these treatments. The variations in dehydrogenase, alkaline phosphatase and β-glucosidase were significant amongst the treatments and showed enzyme specific trends. The study suggests that FA had positive effect on crop growth as well as physico-chemical, microbial and enzymatic activities. Therefore, FA in combination with press mud can be used for an efficient reclamation of sodic soils.

Key words: enzyme activities, earthworm population, fly ash, microbial biomass, sodic soil

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