

Soil biochemical properties and grain quality as affected by organic manures and mineral fertilizers in soil under maize-wheat rotation

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Abbreviations: CRI, crown root initiation; FYM, farm yard manure; RDF, recommended dose of fertilizers; TPF, triphenylformazan.

INTRODUCTION. – The green revolution of the 1960s and 1970s which resulted in dramatic yield increases in the developing Asian countries is now showing signs of fatigue in productivity gains. Intensive agriculture practice without adherence to the scientific principles and ecological aspects has led to loss of soil health as well as depletion of freshwater resources and agrobiodiversity (KESAVAN and SWAMINATHAN, 2008). In order to improve the health of soil ecosystem to sustain or increase agricultural production, it is essential to improve soil biological quality in addition to physical and chemical properties. Soil microbial communities perform necessary ecosystem services, including nutrient cycling, pathogen suppression, stabilization of soil aggregates and degradation of xenobiotics. Measurements of biologically active fractions of organic matter, such as microbial biomass carbon and nitrogen, better reflect changes in soil quality and productivity that alter nutrient dynamics.

Soil enzyme activity is not only considered as an important indicator of soil health and quality, but it reflects the real picture of soil microbial activity. Soil enzymes are believed to be able to discriminate between soil management practices probably because they are related to microbial biomass, which is sensitive to different treatments (NANNIPIERI *et al.*, 1990). Soil enzyme activities are important for