

Research Article

Effect of FYM, biofertilizers and zinc on microbial biomass and enzyme activity in soil at 30 DAS of maize

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Summary

A field experiment was conducted in 2006-07 and 2007-08 to assess the effect of FYM, biofertilizers and zinc on microbial biomass and enzyme activities in soil at 30 DAS of maize. Bio-fertilizers like *Azotobacter* and VAM were utilized. Application of FYM alone and in combination with biofertilizers resulted into increase in the microbial biomass (carbon, nitrogen and phosphorus) and enzyme activity (Dehydrogenase, alkaline and acid phosphatase) in soil. Application of zinc failed to affect microbial biomass and enzyme activity in soil.

Key words : FYM, Biofertilizers, Zinc, Microbial biomass, Enzyme activity

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Introduction

Maize (*Zea mays* L.)- wheat (*Triticum aestivum* L.) is one of the most prevalent cropping sequence followed in sub humid southern plains of Rajasthan. The cereal based cropping system and application of continuous profit motivated imbalanced nutrient application in the matter of great concern for sustainability. In spite of heavy inputs, the net result in such a system is the decline in crop yields because of limitations of one or more micronutrients (Swarup *et al.* 1998). Use of chemical fertilizers or organic alone cannot achieve and sustain desired level of productivity, use of organic manure with chemical fertilizers very essential as this not only sustains the higher levels of productivity but also improve the soil health and enhance the nutrient use efficiency. Keeping the above facts under consideration, an experiment was carried out to study the response of farmyard manure, biofertilizers (*Azotobacter* and VAM) and zinc application on microbial biomass and enzyme activity of soil at 30 DAS of maize.

Resources and Research Methods

A field study was conducted at Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur on typic Haplustept during 2006-07 and 2007-08. The soil of experimental field was clay loam in texture, slightly alkaline in reaction (pH 8.22 and 8.17), medium in organic carbon (0.71 and 0.73%), available nitrogen (233 and 235 kg ha⁻¹), available phosphorus (13.6 and 13.9 kg ha⁻¹) and high in potassium (336 and 340 kg ha⁻¹) in 2006 and 2007, respectively. The experiment consisted of thirty two treatment combinations of two levels of organic manure (with out FYM and 10 t FYM ha⁻¹), four levels of biofertilizers [control, *Azotobacter* inoculation, VAM (*Glomus fasciculatum*) inoculation and *Azotobacter* + VAM inoculation] and four levels of zinc (0, 2.5, 5 and 7.5 kg ha⁻¹). *Azotobacter* and VAM used as a biofertilizers for fixing atmospheric and increasing phosphorus availability. The field experiment was laid out in split plot design allocating organic manures and biofertilizers