



## Impact of integrated nutrient management modules on soil microbial population and fertility under soybean based cropping system

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### ABSTRACT

The field experiment was conducted during 2005-2009 to study the effect of nutrient management modules on soil microbial population and fertility status of soil under system based cropping system. Population of soil bacteria, fungi and actinomycetes was favoured under the integrated management modules in both cropping system. Application of inorganic fertilizers coupled with organic biofertilizers to succeeding gram crop residues produced of previously crop augmented the available N and K of soil at the completion of 4<sup>th</sup> cycle under soybean gram cropping system. The value of N, P and K status of soil were found significantly superior with the application of 50% RDF + FYM @ 5 t ha<sup>-1</sup> over organic or inorganic modules.

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**Key words :** Microbial population, Cropping system, FYM, Vermicompost

### INTRODUCTION

The continuous cropping of cereal-cereal sequence has been documented to decline the nutrient status of soil and crop productivity in the long run. Inclusion of legumes, FYM or vermicompost in a cropping system help in maintaining the level of organic matter, promotion of microbial population and their activities such as organic matter decomposition, aeration, biological nitrogen fixation and availability of plant nutrients, which results in higher yield of the crops and fertility status of soils. Chickpea in well known as good rotational crop which fixes atmospheric nitrogen in root nodules and thereby improves the soil fertility (Karande *et al.*, 2007). Microbiota is responsible for the turnover of nutrient under various cropping system and influencing the dynamics of available plant nutrient (Patil *et al.*, 2003).

Due to continuous and highly imbalanced use of fertilizers cause deleterious effect on fertility status of soil, yield sustainability and soil microbial activities. There is scope to enhance the soil and crop productivity and stimulate the microbial population with the judicious use of organic, inorganic and integrated approaches under soybean based cropping system. Hence, an experiment

was conducted to study the effect of nutrient management modules on soil microbiota and fertility status of soil in the 4<sup>th</sup> cropping cycle under soybean based cropping system grown on vertisol.

### MATERIALS AND METHODS

The experiment was initiated involving soybean-wheat and soybean-gram sequence on vertisol at EAD Farm, College of Agriculture, Nagpur in the rainy season of 2005 to winter season of 2009 in fixed plots each measuring 4.5 m x 6.0 m. The experiment was laid out in strip plot design replicated four times with six treatments. The treatment consisted two cropping sequence with different nutrients modules. The soil was clayey in nature, slightly alkaline in reaction (pH 7.9) and having electrical conductivity 0.23 dSm<sup>-1</sup>, moderately high in organic carbon 7.05 g kg<sup>-1</sup>, medium in available N (294 kg ha<sup>-1</sup>), moderately high in available P (24.67 kg ha<sup>-1</sup>), very high in available K (386 kg ha<sup>-1</sup>). Available nitrogen of soil was determined as described by Subbiah and Asija (1956) and available P and K as described by Jackson (1967). The experiment was started in the year 2005. Soybean (JS-335) was sown on 24.06.2008 and wheat (AKW-

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