

Research  
Paper

## Effect of integrated nutrient management practices on nitrogen use efficiency by maize crop

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### ABSTRACT

A field experiment was conducted during *Kharif* 2009 on a sandy loam soil belongs to the soil taxonomy of Typic Haplustalf, located at College of Agriculture, Navile, Shimoga to study the effect of integrated nutrient management practices on nitrogen fractions, nitrogen use efficiency and productivity of maize (*Zea mays* L.). Two levels of nitrogen applied through organics (FYM and Vermicompost) and inorganics involving nine treatment combinations were tried in a RCBD with three replications. An agronomic nitrogen use efficiency was found highest (73.00) in the treatments involving package of practices compared to other treatments. However, nitrogen use efficiency was found to be more at lower level of nitrogen application and also in the integrated treatments compared to the treatments which received only NPK fertilizers.

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**KEY WORDS :** Integrated nutrient management, Nitrogen use efficiency, Maize

**M**aize (*Zea mays*) has high genetic yield potential than other cereal crops. Hence, it is called as 'miracle crop' and also as 'queen of cereals'. Being a C<sub>4</sub> plant, it is very efficient in converting solar energy in to dry matter. As heavy feeder of nutrients, maize productivity is largely dependent on nutrient management. Among the essential nutrient elements of plants, nitrogen plays an important role as far as plant growth and development is concerned and accounts for 1 to 4 per cent of dry matter of plants. Nitrogen content in plant tissue depends on its availability in soil which in turn dependent on soil factors like pH, organic matter status in soil and biological activity of soil. Many workers proved that available nitrogen status in soils increased with increased supply of nitrogen in the form of either fertilizers or organic manures which ultimately increased the productivity of maize. Further, they reported that only 30 to 40 per cent of the added nitrogen was recovered by crops due to its leaching, volatilization and denitrification losses. The nitrate that is leached from fields, moves with water and contaminates either ground water or surface water bodies and causes an environmental pollution. Hence, management practices may be vital to increase nitrogen use efficiency by crops and also to reduce environmental pollution.

In soils of sandy loam texture coming under high rainfall areas, owing to their low organic matter status and leaching loss of nitrogen from these soils, the availability of nitrogen in soils is low and this becomes a limiting factor for crop production. Therefore, to understand the transformation of nitrogen and their availability to plants becomes an essential part of nitrogen management in order to increase productivity and also to maintain the soil health.

### RESEARCH PROCEDURE

The experiment was conducted at College of Agriculture, Navile, Shimoga during *Kharif* 2009 to study effect of INM on distribution of nitrogen fractions in soil. The soil of experimental field was sandy loam in texture (Typic Haplustalf) having initial pH 5.10 and organic carbon content of soil were 0.33 per cent. The fertility status of experimental field was found to be low in available nitrogen (197.20 kg ha<sup>-1</sup>), high in available P<sub>2</sub>O<sub>5</sub> (52.80 kg ha<sup>-1</sup>) and medium in available K<sub>2</sub>O (182.40 kg ha<sup>-1</sup>) (Table A). The experiment was laid out in Randomized Complete Block Design with three replications.

The treatments were as follows : T<sub>1</sub> – Absolute control, T<sub>2</sub> – 100 per cent N through fertilizer, T<sub>3</sub> – 150