



Soil properties and sugarcane response as influenced by integrated nutrient management

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ABSTRACT

The investigation was undertaken with a view to study the effect of integrated nutrient management with sugarcane trash incorporation on properties of soil under ratoon sugarcane. A field experiment was conducted at Post Graduate Institute Farm, M.P.K.V., Rahuri during 2007-08. The nine treatments were consists of absolute control, RDF (300:170:170) as per soil test, RDF+trash 2.8 MT ha⁻¹ with PSB and without of either Azotobacter or Acetobacter or Azospirillum and their combinations. The plant observation and yield were recorded. The soils after harvest and plant analysis for their respective parameters were carried out by using standard methods. After harvest of ratoon sugarcane the fertility status of soil viz., bulk density, water retention, pH, EC, available nitrogen, phosphorus and potassium content in soil were 1.27 Mg m⁻³, 19.82 %, 8.18, 0.25, 173.21 kg ha⁻¹, 17.51 kg ha⁻¹ and 345.90 kg ha⁻¹, respectively and found to be improved with RDF + chopped trash @ 8 t ha⁻¹ + PSB + Acetobacter + Azotobacter + Azospirillum. Similarly the highest values for chlorophyll, yield contributing characters, cane dry matter, cane yield, CCS yield, brix, POL, sucrose, reducing sugar, CCS percentage were shown by the same treatment. Application of recommended dose of fertilizer to ratoon sugarcane maintained the fertility status of soil, but the use of integrated nutrient management resulted in slight improvement in fertility status of the soil, yield contributing characters, yield and quality of cane as compared to fertilizer alone.

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INTRODUCTION

Continuous use of chemical fertilizers without organic manures has degraded soil fertility and productivity (Jamnua *et al.*, 2002) found that The basic concept underlying the integrated nutrient management system, nevertheless is the maintenance and possible improvement of soil fertility for sustained crop productivity (Yadav, 2000). Sugarcane is known to be soil exausting crop and a heavy consumer of plant nutrients. After the harvest of cane crop lies 10 to 15 per cent of cane yield as trash which is either removed or bwn in field, causes loss of natural and sustainable source for potential to improve soil organic carbon. Trash is having potential to improve soil organic matter status, source of nutrients and mediator for nutrient availability to crop. *Azotobacter*

and *Acetobacter* are able to save 25 to 30 per cent of nitrogen (Kumar and Singh, 1999) and increasing the yield upto 15 per cent. the nutrient conservation and its proper utilization through integrated way of farming using natural resources is possible in ratoon sugarcane. Keeping these facts in view the present studies on effect of integrated nutrient management on physical and chemical properties of soil and crop response of ratoon sugarcane was studied in the present investigation.

MATERIALS AND METHODS

A field experiment on ratoon crop of pre-seasonal sugarcane was carried out at Mahatma Phule Krishi Vidyapeeth, Rahuri during the year 2007-2008. The experimental soil is grouped under inceptisol. It belongs

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