

Integrated nutrient management studies in Banana (cv. ARDHAPURI)

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ABSTRACT

Field experiments were conducted to study the effect of fertilizer doses and their combination with micronutrients (Fe and Zn) and some organic manures like organic booster slurry, vermicompost and farm yard manure on yield of banana fruits, availability of plant nutrient in the soil and their concentration in index leaf tissues. The treatments included three fertilizer doses (200 g N, 150 g P₂O₅ and 200 g K₂O, 150 g N, 112.5 g P₂O₅ and 150 g K₂O and 100 g N, 75 g P₂O₅ and 100 g K₂O g per plant). Each fertilizer level was supplemented with micronutrients (Fe 9.0 g + Zn 4.5 g/plant), organic booster slurry @ 6 l/plant, vermicompost 1.125 kg/plant and farm yard manure @ 10 kg/plant. The results of two years experimentation revealed that the banana yield, availability of plant nutrients in the soil and their concentration in the index leaf tissues were increased with increasing level of fertilizer doses. Integration of organic and inorganic fertilizer was more effective than the inorganic fertilizers alone. Among the various combinations 200 g N + 150 g P₂O₅ + 200 g K₂O per plant combined with organic booster slurry @ 6 litre per plant was found the best over all the treatments in respect of producing maximum bunch weight (18.4 kg) and yield per hectare (81.8 t). This treatment also raised the availability of N, P and K in soil and enhanced the nutrient concentration in index leaf tissues.

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Banana (*Musa* spp.) belongs to family Musaceae is a grass feeder of nutrients. A crop producing 50 tonnes fruits from one hectare area removes 388 kg N, 52 kg P₂O₅, 1438 kg K₂O, 227 kg Ca, 125 kg Mg, 5.9 kg Fe and 4.7 kg Zn (Lahav *et al.*, 1981). To maintain soil fertility and to permit the continuous production these nutrient must be replenished every year. Integrated plant nutrient supply (IPNS) is one of the systems which aims to maintain, improve and adjust soil fertility and supply optimum levels of plant nutrients for sustainable production. However, there is paucity of information about the integrated nutrient management for banana. Such information has become important in view of changing fertilizer use technology and to produce export quality banana fruits. The present experiment was planned as an attempt in this direction.

MATERIALS AND METHODS

Field experiments were laid out for two years (1998-1999 and 1999-2000) in Randomised Block Design with 15 treatment combinations and three replications at Department of Horticulture, Marathwada Agricultural University, Parbhani. Treatments included were 100 per cent recommended dose of NPK fertilizers (200 g N, 150 g P₂O₅, 200 g K₂O per plant), 75 per cent of recommended dose (150 g N, 112.5 g P₂O₅, 150 g K₂O per plant) and 50 per cent of recommended dose (100 g N, 75 g P₂O₅, 100 g K₂O per plant). These fertilizer levels

were integrated with micronutrients @ Fe 9 g + Zn 4.5 g per plant, organic booster slurry @ 6 L per plant, vermicompost @ 1.250 kg per plant and FYM @ 10 kg per plant. Farm yard manure, single super phosphate, muriate of potash, ferrous sulphate and zinc sulphate were applied at the time of planting as per the treatments to respective plots. Urea was applied in three splits during third, fourth and fifth month of planting. Vermicompost was applied one month after planting and organic booster slurry was given in the form of cattle dung slurry (organic booster is prepared in BNF scheme at Marathwada Agricultural University contains macronutrients like NPK, micronutrients B, Cu, Fe, Mn and Zn and beneficial microorganisms Azotobacter and Mycorrhiza and it is used to enrich the cattle dung slurry) in three splits at 15 days interval starting from one month after the application of last split of nitrogen. Recommended package of practices were followed for growing the crop. Soil samples upto 60 cm depth were collected before the start of the experiment to analyse physico-chemical properties.

The observations on yield attributes were recorded after harvest. Plant and soil samples were analysed at flowering stage for N, P₂O₅, K₂O, DTPA Fe and Zn content by following standard methods.

RESULTS AND DISCUSSION

The results obtained from the present investigation are presented below