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Research Article

Effect of INM and *Panchagavya* on micronutrient concentration and yield of ashwagandha (*Withania somnifera* L.)

B. VAJANTHA, M. UMADEVI, M.C. PATNAIK AND M. RAJKUMAR

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MEMBERS OF RESEARCH FORUM :

Corresponding author :
B.VAJANTHA, Department of Soil science and Agricultural Chemistry, College of Agriculture, Acharya N.G. Ranga Agricultural University, HYDERABAD (A.P.) INDIA

Co-authors :
M. UMADEVI, M.C. PATNAIK AND M. RAJKUMAR, Department of Soil science and Agricultural Chemistry, College of Agriculture, Acharya N.G. Ranga Agricultural University, HYDERABAD (A.P.) INDIA

Summary

The field experiments were conducted to study the effect of inorganic fertilizers, organic manures, *Panchagavya* and bio fertlizers on micronutrient concentration in shoot, root and root yield of Ashwagandha at College of Agriculture, Hyderabad during *Rabi* 2007-08 and *Kharif* 2008. The results revealed that there was significant difference observed with fertilizer levels, organic manures, *Panchagavya* and BF. However, their interaction showed non significant effect on Fe, Mn, Zn and Cu concentration. The micronutrient concentration was higher in shoot at flowering than root. At harvest, the concentration relatively increased in root and decreased in shoot. The highest dry root yield was recorded with 150% RDF+ castor cake 2.5 t ha^{-1}+BF.

Key words : Micronutrient concentration, Yield, INM, *Panchagavya*, Ashwagandha

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Introduction

Mineral nutrients play a significant role in plant growth and metabolism of plants. These have yet major role to play in case of plants producing secondary metabolites in the form of aroma chemicals, nutroceuticals, alkaloids and crude drugs. The main enigma in fertilizer management is the wrong practice of using nitrogen, phosphorus and potassic fertilizers only leading to secondary and micronutrient deficiency. These nutrients also play a significant role in the production of good quality and high yield of crops. The role of nutrients mainly Fe, Mn, Zn and Cu etc in photosynthesis, N fixation, respiration and other metabolic processes of the plant is well documented (Patra and Sukmalchand, 2009). Organic manures are an important source of micro nutrients and they play an important role in supply of micronutrients to plants. The present investigation was planned to study the effect of INM and *Panchagavya* on micronutrient concentration in plant tissue and yield of ashwagandha.

Resources and Research Methods

Two field experiments were conducted to study the effect of organic and inorganic sources of nutrients on micronutrient concentration in plant parts and dry root yield of Ashwagandha at College of Agriculture, Acharya N.G. Ranga Agricultural University at Hyderabad on a sandy clay loam soil during *Rabi* 2007-08 (I year) and *Kharif* 2008 (II year). A composite soil sample was collected in both the years from the experimental site (0-20 cm) before the experiment and analysed. The experimental site during both the years was sandy clay loam in texture, slightly alkaline in reaction (7.60 and 7.54) and non-saline (0.16 and 0.18 dS m^{-1}) in nature. It was low in organic carbon (0.40 and 0.40 per cent) and low in available nitrogen (203 and 200 kg ha^{-1}) and medium in available phosphorus (17.08 and 17.12 kg ha^{-1}) and high in available potassium (287 and 263 kg ha^{-1}). The experimental site had DTPA extractable Fee (10.95 and 9.60 mg kg^{-1}), Mn (14.40 and 9.75 mg kg^{-1}), Zn (2.726 and 2.422 mg kg^{-1}) and Cu (1.720 and 1395 mg kg^{-1}). The chemical composition of castor cake,