



Effect of phosphorus, PSB and zinc on content and uptake of isabgol (*Plantago ovata* Forsk)

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Abstract : An experiment was conducted during *Rabi* season of 2003-04 to study the effect of phosphorus, PSB and zinc on growth and quality of isabgol. Result revealed that application of phosphorus up to 20 kg P₂O₅ ha⁻¹, being at par with 30 kg P₂O₅ ha⁻¹, recorded significantly higher nitrogen uptake by seed and straw and total N uptake, phosphorus concentration in seed and straw, phosphorus uptake by straw, total uptake of phosphorus and zinc uptake by seed and total Zn uptake. The inoculation of seed with PSB significantly enhanced nitrogen concentration in seed, phosphorus concentration in seed and straw, nitrogen, phosphorus and zinc uptake by seed and straw, total uptake of nitrogen phosphorus and zinc concentration in seed uninoculated control. Results revealed that increasing levels of zinc up to 5.0 kg Zn ha⁻¹ significantly increased nitrogen uptake by seed and straw and total N uptake, phosphorus uptake by seed and total uptake of phosphorus, zinc concentration in seed and straw, Zn uptake by seed and straw and total uptake.

Key Words : Phosphorus, PSB, Zinc, Uptake, Isabgol

View Point Article : Narolia, G.P. and Shivrana, A.C. (2013). Effect of phosphorus, PSB and zinc on content and uptake of isabgol (*Plantago ovata* Forsk). *Internat. J. agric. Sci.*, 9(1): 338-340.

Article History : Received : 26.11.2012; Revised : 16.12.2012; Accepted : 30.12.2012

INTRODUCTION

At present isabgol crop has required the place “Dollar earner” in North Gujarat and southwestern Rajasthan (Modi *et al.*, 1974). As a whole, India holds near monopoly in production and export of isabgol to the world market and about 80-90 per cent produce is exported through, which about Rs. 100 crores are earned annually (Maiti and Mandal, 2000). During 2003-04 the area and production of isabgol in Rajasthan was 120954 hectare and 74147 tonnes, respectively, with an average productivity of 613 kg ha⁻¹ (Anonymous, 2003).

Application of phosphorus not only increases the crop yield but also improves the quality and imparts resistance against diseases. The use of phosphate solubilizing bacteria assumes greater significance because it helps to convert insoluble organic phosphate into simple and soluble forms. Members of *Pseudomonas*, *micrococcus*, *Bacillus* are some of the PSB. Inoculation of seeds with PSB culture also increase nodulation, crop growth, nutrient availability and uptake and

crop yield (Shrivastava and Ahlawat, 1993).

The deficiency of zinc is major cause of poor yield or even crop failure (Takkar and Randhawa, 1978). It also plays a significant role in various enzymatic and physiological activity of the plant body. Zinc catalyses the process of oxidation in plant cells and vital for transformation of carbohydrate. Therefore, present investigation was under taken to find out the effect of phosphorus, PSB and zinc on the performance of isabgol.

MATERIALS AND METHODS

The experiment was conducted at SKN College of Agriculture, Jobner (Jaipur) during *Rabi* season, 2003-04 on loamy sand soil. The soil pH was 8.3 and low in organic carbon (0.24%), available nitrogen (127.0 kg ha⁻¹), phosphorus (18.70 kg P₂O₅ kg ha⁻¹), zinc (0.40 ppm) and medium in potash (150.90 kg ha⁻¹). The treatments consisted of four levels of phosphorus (0, 10, 20 and 30 kg P₂O₅ ha⁻¹), two levels of PSB (without and with inoculation) in main plot and three levels of zinc (0, 2.5

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