

Growth and quality of isabgol (*Plantago ovata* Forsk) influenced by phosphorus, PSB and zinc

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SUMMARY

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. The results showed that application of phosphorus up to 20 kg P₂O₅ ha⁻¹ significantly increased the plant height, number of tillers per plant; dry matter accumulation at harvest, protein concentration in seed and husk recovery. The inoculation of seed with PSB significantly enhanced the plant height, number of tiller per plant, dry matter accumulation at harvest, protein concentration in seed and husk recovery over uninoculated control. Also significant improvement in growth parameter *viz.*, the plant height, number of tillers per plant, dry matter accumulation at harvest, protein concentration in seed and husk recovery were also observed with the application of zinc up to 5.0 kg ha⁻¹.

Key Words : Growth, Quality, Phosphorus, PSB, Zinc, Isabgol

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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 *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 (Shrivastav and Ahlawat, 1993).

The deficiency of zinc is major cause of poor yield or even crop failure (Takkur and Randhawa, 1978). It has also play 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 consisting four levels of phosphorus (0, 10, 20 and 30 kg P₂O₅ ha⁻¹), two levels of PSB (without and

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