



Efficacy of bio-fertilizers and fertilizers on growth and yield of brinjal cv. GOB-1

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ABSTRACT

The study clearly indicated that the combined application of bio-fertilizers (*Azospirillum* and Phosphobacteria) along with inorganic fertilizers at 75% of the recommended dose of N, P and 100% of K favourably influenced the growth and yield (538.08 q ha⁻¹) of brinjal cv. GOB-1.

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Key words : Brinjal, Biofertilizers, *Azospirillum*, Phosphobacteria, Yield

Brinjal (*Solanum melongena* L.) is one of the most important commercial vegetable crops grown all over India for its high nutritive value and remunerative price. India ranks first both in area (5.1 lakh ha) and production (88 lakh MT). The productivity of India compared to the world average of 22 tonnes ha⁻¹ is 16.5 tonnes ha⁻¹ (Anonymous, 2004). For achieving high level of productivity, nutrient management plays an important role. High yielding varieties required high amount of nutrients, which has lead to increase in input cost on fertilizers. Excessive use of fertilizers and continuous cropping has caused adverse effect on physico- chemical properties of soil. This has resulted in decline of yield. These effects have made it necessary to search for alternate sources of fertilizers called bio-fertilizers which are eco-friendly and cost efficient. Thus, the experiment was carried out to find the suitable combination between chemical and bio-fertilizers to minimize the input cost and improve productivity.

MATERIALS AND METHODS

The experiment was carried out at the Horticulture Research cum Demonstration farm, B. A. College of Agriculture, AAU, Anand, Gujarat during *Kharif* season of 2008-09, in a Randomized Block Design with nine treatments (Table 1 and 2) in four replications. The crop received an uniform dose of 100: 50: 50 kg NPK ha⁻¹ through urea, di-ammonium phosphate and muriate of potash, respectively. The entire dose of P and K and the

half the quantity of N was given as basal before transplanting. The remaining N was applied in two splits. Five weeks old seedlings of brinjal variety GOB-1 were transplanted at a spacing of 90 x 60 cm. *Azospirillum* and PSB (Phosphate Solubilizing Bacterium) culture were applied as seedling treatment. The data were collected on plant height, number of branches per plant, plant spread, number of fruits per plant, length of fruit, diameter of fruit, fruit weight, fruit volume, fruit yield per plant and hectare.

RESULTS AND DISCUSSION

The plant height, number of branches per plant and plant spread showed significant increase on application of 75% recommended dose of chemical fertilizers (75: 37.5 kg NP ha⁻¹) in combination with bio- fertilizers namely *Azospirillum* and phosphobacteria (Table 1). The improvement in plant height, number of branches per plant and plant spread was due to proper development of the root system caused by increase in root branches. Thus, helped to increase the uptake of nutrients as well as growth promoting hormones like, IAA, GA, cytokinin produced by microbes near root zone (Anuburani and Manivannan, 2002; Govindam and Purushothaman, 1984). Thus, phosphobacteria helps in conversion of unavailable phosphorus form to the available form especially, in early crop growth phase. Another mechanism by which phosphobacteria augment the plant growth, was by the biosynthesis of growth promoting substances like vitamin