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# Comparative performance of *Azotobacter* biofertilizers on growth and yield of Brinjal

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## ABSTRACT

The inoculation of five *Azotobacter* biofertilizers from different companies product, resulted significant increase in plant height, number of branches, number of fruits per plant, and yield/ha as compared to uninoculated control. The inoculation effect was maximum in respect of MPKV *Azotobacter* biofertilizer. Significant increase in yield and yield attributing parameters were recorded by an increase in the level of nitrogen along with *Azotobacter chroococcum* inoculation. The yield obtained due to $T_3$ (75 kg N/ha) level with *Azotobacter chroococcum* inoculation was almost equal to an application of $T_1$ (100 kg N/ha) level without inoculation. It clearly indicated that 25 kg N/ha could be saved if supplemented with *Azotobacter chroococcum* inoculation. The maximum increase in plant height, number of branches, number of fruits, weight of fruits per plant were given by MPKV *Azotobacter* biofertilizer along with recommended dose of fertilizer. However, the companies product *viz.*, Akash, Azobact and Ojas were found at par in recording plant height, number of branches, number of fruits and yield per plant obtained as compared to MPKV's biofertilizers.

**Key words :** *Azotobacter chroococcum*, Growth parameters, Brinjal.

Brinjal (*Solanum melongena* Linn.) is one of the most important vegetable crop widely cultivated throughout the warmer region of the world. In India West Bengal stands first in production of Brinjal. In Maharashtra, brinjal is grown on an area of 27057 hectares. Total production was 392429 tons and average yield 14.50 t/ha in the year 2004-05 (Anonymous, 2005). It is roughly estimated that *Azotobacter* spp. can fix 10 to 15 kg nitrogen per hectare. The seed germination and vigour of the young plants was also observed to improve due to *Azotobacter* inoculation (Shende *et al.*, 1975).

The ability of *Azotobacter* to enter into dormancy as cysts might help in exploring some of the great variability of plant response to inoculation and also for ace-ecological studies for biological nitrogen fixation "Nitrogenase" enzyme is very important which is sensitive to oxygen. *Azotobacter* protects this enzyme by forming slime around cell. It converts atmospheric nitrogen in cellular proteins. Then cell proteins get mineralized in soil after death of *Azotobacter* cell contributing towards the nitrogen availability to the crop plants.

The present investigation was, therefore, undertaken to study the quality of *Azotobacter* biofertilizers from different companies product with an objectives to see the effect of efficient *Azotobacter* strains on growth and yield of brinjal under field condition.

## MATERIALS AND METHODS

The experimental work was conducted on the Instructional Farm Area of Post Graduate Institute, M.P.K.V., Rahuri during Kharif season of 2006. The seeds of brinjal cv. MAHYCO-10 @ 500 gm/ha were required for preparation of nursery. The experiment was carried out in Randomized Block Design with seven treatments and three replications The fertilizers for brinjal crop were applied @ 100:50:50 kg NPK/ha (recommended dose) through urea, single super phosphate and muriate of potash. Raised bed of 3 x 1 x 0.15 m was prepared and mixed with 20 kg well decomposed farm yard manure with soil. The phorate granules 10 G (@ 10 kg/ha) were applied to control thrips and jassids. On the raised beds seeds of brinjal were sown and then covered with soil. The bed was immediately irrigated with the help of water can. Further irrigations were given as and when required.

The seedlings were sprayed with insecticides *viz.*, malathion, endosulphon (@ 10 ml/10 litre water) at an interval of 7-10 days to control the pests. The seedlings were ready for transplanting after 45 days of sowing.

The treatment details are : $T_1$ = Recommended dose of fertilizer (control), $T_2$= 100 % recommended dose of N + MPKV *Azotobacter* biofertilizer, $T_3$=75 % recommended dose of N + MPKV *Azotobacter* biofertilizer, $T_4$=75 % recommended dose of N + MPKV PSB, $T_5$=75 % recommended dose of N + Akash, $T_6$=75 % recommended dose of N + Azobact, $T_7$=75 % recommended dose of N + Ojas

The ability of *Azotobacter* to fix atmospheric nitrogen was studied by growing them on Jensen's broth and Burk's