

## Effect of liquid biofertilizer on the nutrient content and uptake of okra cv. PARBHANI KRANTI

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### ABSTRACT

An experiment was carried out at the farm of Annamalai University during summer 2006 to investigate the effect of different liquid biofertilizer on the nutrient content and uptake by okra. Symbion N and P were liquid formulation of Azospirillum and phosphobacter, respectively, supplied by T. Stanes and Co., Pvt. Ltd. The experimental results revealed that soil application of both Symbion N and Symbion P significantly increased the nutrient content and uptake by okra besides improving the yield.

**Key words :** Liquid biofertilizer, Nutrient content, Nutrient uptake.

**A** *belmoschus esculentus* is one of the drought tolerant vegetable species in the world. It tolerates poor soils with heavy clay and intermittent moisture. In Tamilnadu, the area under cultivation is 3417 ha with a production of about 21,360 metric tones and productivity of 6.25 metric tones per hectare. It can also be grown as an irrigated as well as rainfed crop (Ajay Verma, 2000). Continuous use of inorganic fertilizer has resulted in reduction in yield and deteriorated the soil quality. Integrated nutrient application with inclusion of biofertilizer and organics is the recent felt need to increase production and sustain soil health. Azospirillum is capable of fixing of 40-60 kg ha<sup>-1</sup> nitrogen and this has been reported in several horticultural crops (Dhanalakshmi and Pappiah, 1993). Application of phosphobacteria converts the insoluble form of phosphorus to soluble form and makes it available and facilitates easy absorption (Manomani, 1992). Hence the present study was carried to find out the effect of liquid biofertilizer on nutrient content and uptake in okra.

### MATERIALS AND METHODS

A field experiments was conducted at Annamalai University experimental farm during summer 2006. The soil of study area was well drained clay loam and had pH 7.94, EC 0.98 dSm<sup>-1</sup>, organic carbon 0.52 per cent and available NPK status were low, medium and high, respectively. The crop selected for the study was okra variety Parbhani Kranti. The experiment was carried out in a Randomized Block Design with three replications. The experimental treatments were: (T<sub>1</sub> - Symbion N alone (Liquid Azospirillum) @ 250ml as foliar application, T<sub>2</sub> - Symbion P alone (Liquid Phosphobacter) @ 250ml as soil

application, T<sub>3</sub> - Symbion N (Liquid Azospirillum) + Symbion P (Liquid Phosphobacter) @ 250ml as foliar and soil application, T<sub>4</sub> - Symbion N (Liquid Azospirillum) + Symbion P (Liquid Phosphobacter) @ 250ml + 250ml as soil and soil application, T<sub>5</sub> - Control). At the harvest stage of the crop, the fruit yield was recorded. The plant and fruit samples were collected, dried in hot air oven at 65°C, powdered and digested using diacid (H<sub>2</sub>SO<sub>4</sub>:HClO<sub>4</sub>) in the ratio of 4:1 and analysed for the content of nitrogen, phosphorus and potassium using the procedure of Jackson (1973).

### RESULTS AND DISCUSSION

#### Nitrogen :

The results of the study indicated that the combined application of Symbion N and Symbion P as soil application (T<sub>4</sub>) significantly increased the nitrogen content in fruit (2.39 per cent) and stover (1.79 per cent) (Table 1). This was followed by the treatment T<sub>3</sub> (Symbion N and Symbion P as foliar and soil application, respectively) which recorded 2.26 per cent N in fruit and 1.68 per cent N in stover. The data with regard to nitrogen uptake is shown in (Table 2). Among the treatments, T<sub>4</sub> (soil application of both Symbion N and Symbion P) recorded the highest nitrogen uptake of 151.09 kg ha<sup>-1</sup> and 35.08 kg ha<sup>-1</sup> by fruit and stover, respectively, followed by T<sub>3</sub> (Symbion N -foliar + Symbion P - soil) which recorded 132.98 kg ha<sup>-1</sup> and 27.65 kg ha<sup>-1</sup> of N uptake by fruit and stover, respectively. The lowest uptake was observed in T<sub>5</sub> (control). A similar result of uptake of N due to Azospirillum was reported in okra (Parvatham *et al.*, 1989) through improving nitrogen availability in the rhizosphere,