

Effect of micro nutrients on growth, yield attributes and pod yield of okra (*Abelmoschus esculentus* (L.) Moench) in semi-arid zone of Uttar Pradesh

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ABSTRACT

A field experiment was conducted during summer seasons of 2006 and 2007 at Bhaktigarhi, district Firozabad, U.P. with three zinc levels (0, 30 and 60 ppm), three boron levels (0, 30 and 60 ppm) and three Molybdenum levels (0, 30 and 60 ppm) with the objective to see the effect on yield and economics of okra (*Abelmoschus esculentus* L. Moench). Application of zinc, boron and molybdenum improved growth, yield attributes and yield. The application of zinc, boron and molybdenum (60 ppm), individually increased significantly green pod yield of 93.70, 88.35 and 86.57 q/ha followed by 30 ppm and control. Growth and yield attributes were found in similar trends. Higher monetary return and B: C. ratio was found at higher tested doses of zinc, boron and molybdenum, compared with lower dose and control. The better combination of zinc, boron and molybdenum application was 60 ppm for obtaining higher yield and net returns from okra green pods.

Key words : Okra, Zinc, Boron and molybdenum, C: B ratio, Net returns

For a well balance diet about 285 gram vegetables are needed per capita out of which 80 grams root vegetables, 125 green leafy vegetables and 80 other vegetables. Okra (*Abelmoschus esculentus* L.) finds a prominent place among vegetables in Indian families and is available in the market for a major part of the year. Macronutrients also play direct or indirect role in plant growth and development. Plants absorb these elements in minor quantity but they are essential for proper growth of plant. They are also needed for the production and quality of vegetables. It has been known for many years that plants are able to absorb essential elements through their leaves. The absorption takes place through the stomata's of leaves and also through the leaf cuticle. Zinc, boron and molybdenum have been successfully used in the past by many workers for plant growth and quality in the form of foliar spray on the leaves but very little work has been done with reference to the use of micro-nutrients on the growth and yield of okra. Keeping in view the above facts, the present investigation was laid out to find out the effect of micronutrients management (zinc, boron and molybdenum) on growth and yield of okra.

MATERIALS AND METHODS

An experiment was carried out at Bhaktigarhi, district Firozabad (U.P.), during summer seasons of 2006 and 2007. The soil was sandy loam having organic carbon 0.32%, pH 7.7, available N, P and K 0.052, 0.0079 and 0.020%, respectively. The treatments comprised of three

zinc levels (0, 30, and 60 ppm), three boron level (0, 30, and 60 ppm) and three molybdenum levels (0, 30, and 60 ppm) and these were tested in Factorial Randomized Block Design with four replications. The okra variety "Azad Bhindi -1" was sown on first week of March at spacing of 30 cm x 30 cm. Full phosphorus and potassium and half dose of nitrogen (60:60:40 kg/ha) were applied at the time of sowing and remaining 30 kg N/ha was applied after first irrigation.

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Effect of zinc:

Application of zinc @ 60 ppm yielded significantly higher green pod (89.85 and 97.55 q/ha) over no zinc and 30 ppm during both the years (Table 2). The increase in yield was 21.44 and 9.77% in first year and 20.96 and 8.53 % in second year over no zinc and 30 ppm, respectively. Increase in green pod yield owing to application of zinc might be attributed to increase in plant height, leaves /plant, primary and secondary branches / plant, pod length, pods /plant and fresh weight / pod (Table 1). Similar results have also been reported by Shrihari *et al.* (1987). The highest gross and net returns and benefit: cost ratio were recorded with 60ppm (Rs. 35606/ha and Rs. 23320/ha and 1:1.90) followed by 30 ppm (Rs. 32536/ha and Rs. 20295/ha and 1: 1.66) and no zinc (Rs. 29416/