IJPS INTERNATIONAL JOURNAL OF PLANT SCIENCES
e ISSN-0976-593X Volume **12** | Issue 2 | July, 2017 | 160-163

DOI: 10.15740/HAS/IJPS/12.2/160-163
Visit us - *www.researchjournal.co.in*

RESEARCH ARTICLE

Effect of zinc and boron on growth of brinjal (*Solanum melongena* L.)

■ **MAHESH M. SOLANKI, MANJUSHA S. SOLANKI, GAJANAN THAKARE, PALLAVI D. JOGI AND DEEPAK R. SAPKAL**

SUMMARY

A micronutrient is the essential element for plant growth and development. Present study amied to exploer in detail the effect of zinc and boron on growth, yield and quality of brinjal (*Solanum melongena* L.). The experiment consisted of 9 treatments laid out Completely Randomized Design with three replications. The individual treatment of 5 mg zinc, 10 mg zinc, 5 mg boron and 10 mg boron and treatment combinations 5 mg Zn + 5 mg B, 5 mg Zn + 10 mg B, 10 mg Zn + 5 mg B and 10 mg Zn + 10 mg B per kg soil was given in brinjal pots, the growth parameters like plant height, number of leaves, number of branches, number of flowers and yield parameters like maximum number of fruits per plant was obtained in brinjal influenced by combination of treatments T_8 (10 mg Zn + 10 mg B) and was significantly superior at 5 per cent over rest of the treatments.

Key Words : Boron, Zinc, *Solanum melongena* L., Quality

How to cite this article : Solanki, Mahesh M., Solanki, Manjusha S., Thakare, Gajanan, Jogi, Pallavi D. and Sapkal, Deepak R. (2017). Effect of zinc and boron on growth of brinjal (*Solanum melongena* L.). *Internat. J. Plant Sci.,* **12** (2): 160-163, **DOI: 10.15740/HAS/IJPS/12.2/160-163**.

Article chronicle : Received : 24.03.2017; **Revised :** 05.05.2017; **Accepted :** 23.05.2017

Brinjal (*Solanum melongena* L.) is popular vegetable and is native of India. It can be grown throughout the year in almost all the states of India except at higher altitudes. The important brinjal growing countries in the world are India, Bangladesh, Pakistan, China, Cyprus, Egypt, Japan, Philippines, Syria and Western Europe (Anonymous, 2001). Brinjal fruit contains high amount of carbohydrates (6.4%), protein (1.3%), fat (0.3%), calcium (0.02%), phosphorus (0.02%), iron (0.0013%) and other mineral matters. Apart from these, it also contains carotene (34 mg), riboflavin (0.05 mg), thiamine (0.05 mg), niacine (0.5 mg) and ascorbic acid (0.9 mg) per 100 g of fruit brinjal is a staple vegetable in diet since ancient time and both poor and rich like it. It is of, high in nutritive value and can be compared with tomato. Nutritionally, brinjal is low in

MEMBERS OF THE RESEARCH FORUM

Author to be contacted :
MANJUSHA S. SOLANKI, Department of Biological Sciences, Allahabad School of Agriculture, Sam Higginbottom Institute of Agricutlure, Technology and Sciences, ALLAHABAD (U.P.) INDIA
Email : maheshraj720@gmail.com

Address of the Co-authors:
MAHESH M. SOLANKI, GAJANAN THAKARE, PALLAVI D. JOGI AND DEEPAK R. SAPKAL, Department of Biological Sciences, Allahabad School of Agriculture, Sam Higginbottom Institute of Agricutlure, Technology and Sciences, ALLAHABAD (U.P.) INDIA

energy (30 kcal/100g), protein (1.2%) and vitamin C (5 mg/100g), but is a very good source of dietary fibre, potassium, calcium, manganese, copper and vitamin also possess antioxidant ability (KAU-AgriInfotech portal, 2012). Indian population being predominantly vegetarian attributes a prominent position to vegetable in their diet to meet the protein, vitamin and carbohydrate requirement. India is the second largest producer in the world, about 4 million hectare of land is occupied by vegetable in india and approximately about 3.7 per cent of total cultivated land area of brinjal. Orissa is largest producer of brinjal followed by West Bengal. Plant nutrition plays an important role for enhancing yield and quality in brinjal (Bid *et al.,* 1992). Micronutrients like iron, zinc and boron are essential for plant growth and metabolism. Iron is necessary for the synthesis of chlorophyll, though it actually does not enter into its composition (Bid *et al.,* 1992). Iron starved plants develop chlorosis in the young leaves and the veins remaining green. Zinc in the ionic form (Zn^{++}) or in form of a complex with a chelating agent e.g., EDTA, is taken up by the plants. Salts or complexes of zinc can easily absorbed directly through leaves. Hence, their foliar spray is used for correcting zinc deficiency. Therefore, keeping the above points in view, the present study on effect of zinc and boron on growth, yield and quality of brinjal (*Solanum melongena* L.) was undertaken with the objective to determine the effect of zinc and boron on growth, yield and fruit quality of brinjal (Elabdeen and Metwally, 1982).

MATERIAL AND METHODS

The experiment was conducted at Sam Higginbottom Institute of Agriculture Technology and Sciences during 2012. The experiment consisted of 9 treatments laid out in Completely Randomized Design with three replications, the individual treatment of 5 mg Zn, 10 mg Zn, 5 mg B and 10 mg B and treatment combinations 5 mg Zn + 5 mg B, 5 mg Zn + 10 mg B, 10 mg Zn + 5 mg B and 10 mg Zn + 10 mg B per kg soil was given in brinjal pots. At the time of experiment growth parameters observed were like plant height, number of leaves, no. of branches, number of flowers, number of fruits, fruit length (fruit yield) etc.

RESULTS AND DISCUSSION

Data collected were subjected to statistical analysis based on mean values of three randomly selected plants from pot of three replications.

The data presented in Fig. 1 showed a significant positive response at 5 percent significant levels of zinc and boron on brinjal. At 30 DAT, maximum plant height was found in T_8 (17.12 cm) and minimum was found in T_0 (12.85 cm). At 60 DAT maximum plant height was found in T_8 (27.25 cm) and minimum was recorded in T_0 (20.18 cm) and maximum plant height at 90 DAT was recorded in T_8 (55.17 cm) and minimum was recorded in T_0 (23.76 cm). Similar results have been reported by Ingle *et al.* (1993) in chilli and combined application of the zinc and boron on tomato plant height (cm) by Bose and Tripathi (1996).

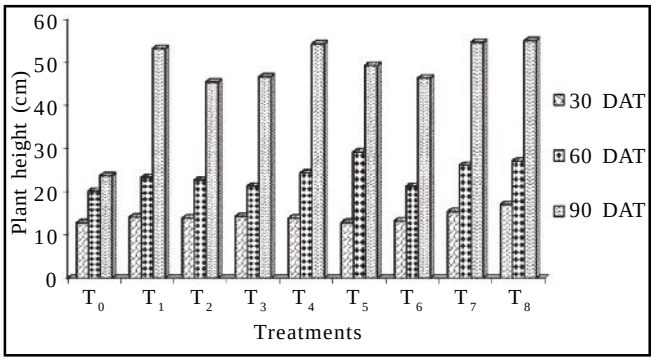

Fig. 1 : Effect of zinc and boron on plant height (cm) of brinjal

The Fig. 2. showed significant at 5 per cent level on number of leaves due to different levels of zinc and boron. At 30 DAT, maximum number of leaves was found in T_8 (17.33 cm) and minimum was found in T_0 (8.12 cm). At 60 DAT maximum number of leaves was found in T_8 (36.34 cm) and minimum was recorded in T_0 (23.15 cm) and maximum number of leaves at 90 DAT was recorded in T_8 (88.97 cm) and minimum was recorded in T_0 (55.51 cm). Verma *et al.* (1973) reported that the application of boron increment of number of leaves in tomato and similar result of increment of number

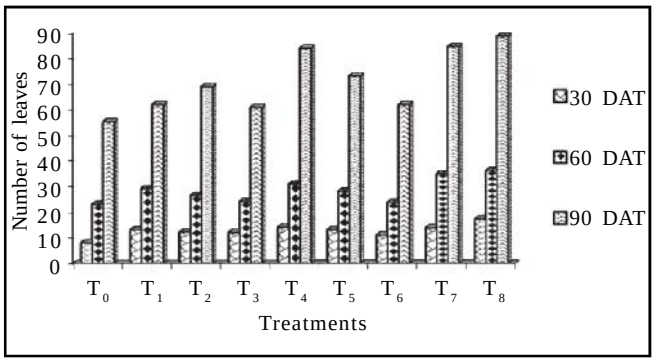

Fig. 2 : Effect of zinc and boron on number of leaves of brinjal

of leaves application of boron in French bean by Padma *et al*. (1989).

The analysis of data presented in Fig. 3 showed that different levels of zinc and boron had a significant effect at 5 per cent level on the number of branches. At 30 DAT, maximum number of branches was found in T_8 (2.60 cm) and minimum was found in T_0 (1.02 cm). At 60 DAT maximum number of branches was found in T_8 (7.20 cm) and minimum was recorded in T_0 (2.60 cm) and maximum number of branches at 90 DAT was recorded in T_8 (17.80 cm) and minimum was recorded in T_0 (8.44 cm).

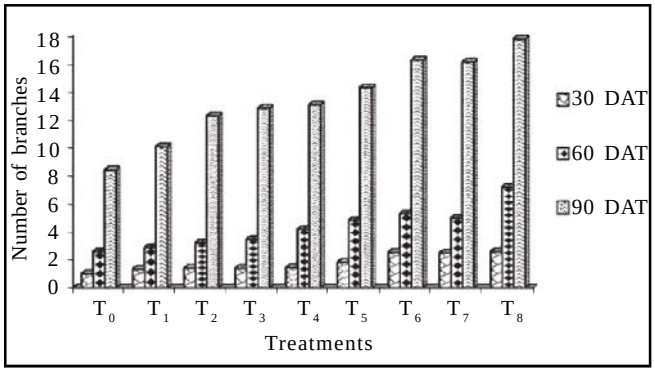

Fig. 3 : Effect of zinc and boron on number of branches of brinjal

The data presented in Fig. 4 showed a significant positive response of different levels of zinc and boron on number of flower. At 60 DAT maximum flower per plant was found in T_8 (18.32) and minimum was found in T_0 (6.72).

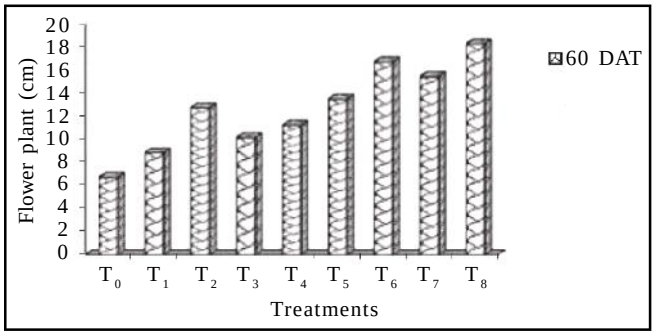

Fig. 4 : Effect of zinc and boron on number of flower of brinjal (*Solanum melongena* L.) cv. RUTIKA at 60 DAT

Fig. 5 showed significant difference on total number of fruits of brinjal due to different levels of zinc and boron. At 90 DAT in T_8 (9.33) had maximum number of fruits and minimum was found in T_0 (3.34). Increment number of fruits per plant in tomato application of zinc at 5 and 10 ppm also been report by Mallick and Muthukrishnan (1980) and Dube *et al.* (2003) reportedd that maximum increase in vitamin C content of tomato fruits (25.27 mg/100 g) was recorded with the application of zinc which accounted for an increase of 36.89 per cent as compared to 18.46 mg/100 g in control.

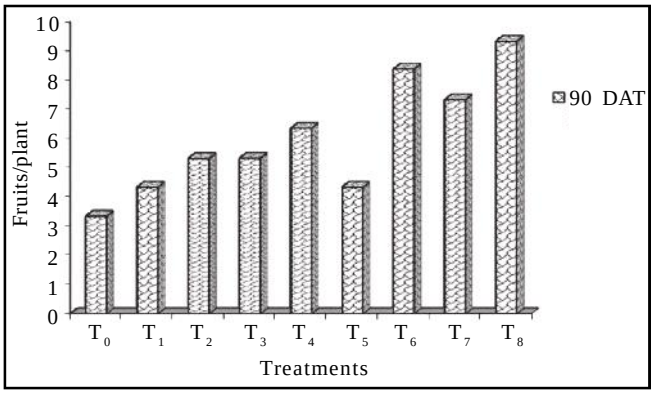

Fig. 5 : Effect of zinc and boron on total number of fruits of brinjal (*Solanum melongena* L.) at 90 DAT

Conclusion :

On the basis of one trial experiment, there were 9 treatment combinations which were replicated 3 times under Randomized Block Design (RBD) the effect of treatments on growth and yield of brinjal were independently determined. After that, it is concluded that the effect of zinc and boron on growth, yield and quality parameters of brinjal showed best performance with treatment T_8 (10 mg Zn kg^{-1} + 10 mg B kg^{-1}).

REFERENCES

Anonymous. (2001).*Vegetable seed production*, Agrotech Publishing Academy, Udaipur, **1**: 110-12

Bid, N.N., De, A.K., Srivastava, B.K. and Kole, K.K.(1992). Response of micronutrients, zinc and copper on brinjal (*Solanum melongena* L.). Proceedings of the Workshop on Micronutrients, 22-23 January, 1992, Bhubaneshwar, India, 305-310.

Bose, U.S. and Tripathi, S.K.(1996). Effect of micronutrients on growth, yield and quality of tomato cv. PUSA RUBY in MP. *Crop Res.*, **12** : 61-64.

Choudhary, B. (1976). *Vegetable* (4th Edn.), biology of brinjal National Book Trust, New Delhi : 50-58.

Dube, B.K., Pratima, S., Chatterjee, C. and Sinha, P. (2003). Effect of zinc on the yield and quality of tomato. *Indian J. Hort.*, **60**(1): 59-63.

Elabdeen, A.Z. and Metwally, A.M.(1982) Effect of zinc on

growth, yield and quality of tomato. *Agric. Res. Rev.*, **60** : 143.

Ingle, V.G., Thakre, A.U., Badhe, S.B. and Khan, M.A.H.(1993). Effect of foliar spray of auxins, micronutrients with urea on fruit drop and yield of chilli cv. CA- 960. *Panjabrao Krishi Vidyapeeth Res. J.*, **17** : 142-145.

Mallick, M.F.R. and Muthukrishnan, C.R.(1980). Effect of micronutrients on the quality of tomato (*Lycopersicon esculentum*. Mill.). *Veg. Sci.*, **7** : 6-13.

Padma, M., Reddy, S.A. and Babu, R.(1989).Effect of foliar sprays of molybdenum (Mo) and boron (B) on vegetative growth and dry matter production of French bean (*Phaseolus vulgaris* L.). *J. Res. Andhra Pradesh Agric. Univ.*, **17**: 87-89.

Verma, A.N., Ram, K. and Sharma, R.K.(1973). Growth, yield and quality of tomato (*Lycopersicon esculentum* Mill.) as affected by foliar applications of boron in sand culture. *Mysore J. Agric. Sci.*, **7**: 130-132.