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Short communication

Response of foliar application of micronutrients on tomato variety Rashmi

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Tomato (*Lycopersicon esculentum* L.) of family Solanaceae assumes great significance due to its nutritional excellance. It is one of the most popular and widely grown vegetable and cultivated throughout the world for its fresh and as well as for processed products. Productivity of tomato in India (17.4 t/ha) is quite meager than the world productivity (27.73 t/ha) (NHB database, 1). There is an ample scope to enhance the productivity by adopting various techniques. Application of micronutrient has got the tremendous effect besides the use of major nutrient fertilizers to increase crop yield. Micronutrients like boron, copper, molybdenum and zinc if applied through foliar means can improve the vegetative growth, fruit set and yield of tomato (Arora *et al*., 2) In view of the above facts the present study was undertaken to assess the impact of micronutrients on growth and yield of tomato.

The experiment was conducted at Research Field of Horticulture, Allahabad Agriculture Institute- Deemed University, Allahabad. The treatments consisted two levels each of boric acid, *i.e.* 100 and 200 ppm, zinc sulphate, *i.e.* 100 and 250 ppm, Copper sulphate, *i.e.* 100 and 250 ppm and multiplex, a complex micro-nutrient (composition: Zn- 3%, Fe- 2.5%, Mn- 1.0%, Cu- 1.0%, Bo- 0.5% and Mo- 0.1%), *i.e.* 100 and 250 ppm comprising eleven treatment combination with one control. The experiment was laid out in Randomized Block Design with three replication. All the micronutrients were sprayed on plant foliage along with Teepol as sticking agent. Three spray was done on 30, 45 and 60 days after transplanting. Data was recorded on five randomly selected plants in each replication for various growth, yield attributing traits, yield and quality parameters. All the recommended cultural practices were adopted uniformly. Significance and non-significance of variances due to different treatments were determined by calculating the respective 'F' values as per the method described by Panse and Sukhatme (3).

Micronutrient application to tomato plants showed beneficial effect on growth, yield attributing traits, yield as well as quality. Perusal of data presented in Table1 indicated that the plant height, number of flowers per inflorescence, number of fruits per plant, fruit yield increased with the combination of boric acid + zinc sulphate + $CuS0_4$ @250 ppm each. The data in Table 1 revealed that maximum plant height (80.4 cm) was recorded under the treatment T8 whereas minimum (66.60 cm) in treatment T0, *i.e.* control. This increase in height might be due to the fact zinc may serve as source of energy for synthesis of auxin and help in elongation of stem. This was in accordance with the result of Bose and Thripathi (4).The maximum number of branches per plant (34.7) was observed in the same treatment. This treatment is statistically at par with the treatment, T2 and T6. Number of flowers per inflorescence was found significant and data are presented in Table1. Data clearly indicated that the treatment T8 produced maximum value (9.13) followed by treatment T7 (8.73), while the minimum value (7.07) was recorded in T0, *i.e.*, control.

The variation in number of flowers per inflorescence might be due to the enhancement in translocation of carbohydrate from the site of synthesis to storage tissue in plant as micronutrient combination particularly boron. Number of fruits per plant was found significant and maximum value was (35.67) recorded in treatment T8 followed by treatment T7 (32.67). The variation in number of fruits per plant can be explained on the basis of number of flowers per plant because these are interrelated characters' reported with Singh and Verma (5). Combination of micronutrients particularly boron increased the level of sugar on stigma of flower which helped in fruit set due to better pollen germination and pollen tube growth. The maximum fruit yield (1.18 kg/ plant and 375.94 q/ha) was recorded with treatment T8 followed by treatment T7 (1.16 kg/ plant and 353.77 q/ha) recorded with control. Results are in the accordance with the findings of Prasad *et al*. (6), Graves *et al*. (7) and Gupta *et al.* (8). Higher fruit yield might be due to the yield attributing traits (like-number of flowers, number of inflorescence, number of fruits) and growth characters (plant height, number of branches) influenced by micronutrient application. Physic-chemical analysis of tomato fruits from treated plots (Table 1) revealed that total soluble solids was significantly improved due to micronutrient application

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Table 1. Effect of micronutrients on different attributes of tomato.

Treatment	Plant height (cm)	No. of branches	No. of flowers/ plant	Fruit yield/ plant (kg)	Fruit yield (q/ha)	TSS (%)	Ascorbic acid (mg/100g)
T0 - Control	66.60	19.53	30.87	1.09	291.67	7.87	28.08
T1 - Boric acid @ 100 ppm	75.07	22.07	36.60	1.11	319.13	8.20	29.00
T2 - Boric acid @ 250 ppm	76.13	23.27	37.67	1.15	344.70	8.50	30.16
T3 - Zinc sulphate @ 100 ppm	72.07	21.00	34.93	1.10	306.94	7.93	28.41
T4 - Zinc sulphate @ 250 ppm	75.53	22.20	36.80	1.12	328.70	8.20	29.17
T5 - Copper sulphate @ 100 ppm	72.93	21.47	36.20	1.11	314.70	8.17	28.93
T6 - Copper sulphate @ 250 ppm	77.07	23.33	39.07	1.17	348.03	8.50	30.64
T7 - BA + $ZnSO_4$ + $CuSO_4$ @ 100 ppm each	77.20	32.48	39.07	1.10	353.77	8.53	31.33
T8 - BA + $ZnSO_4$ + $CuSO_4$ @ 250 ppm each	80.40	34.73	41.47	1.18	375.94	8.70	31.99
T9 - Multiplex @ 100 ppm	72.13	21.33	36.07	1.10	308.64	7.97	28.60
T10 - Multiplex @ 250 ppm	75.67	22.67	37.67	1.14	339.76	8.27	29.77
CD at 5%	0.98	0.67	1.05	.02	5.26	0.13	0.44

and it was measured maximum (8.70%) in treatment T8 followed by T7 (8.53%), while minimum total soluble solids (7.87%) was measured in treatment T0. Ascorbic acid was significantly improved due to the application of micronutrients and it was measured highest (31.99 mg/100 g) in treatment T8 and minimum (28.08 mg/100 g) was recorded with treatment T0 (control). This is in close agreement with the results of Chatterjee *et al.* (9) and confirmed that zinc increased the level of ascorbic acid content.

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