HortFlora Research Spectrum, 2(1): 87-89 (Jan.-March 2013) ISSN : 2250-2823

Research Note :

IMPACT OF MICRONUTRIENT SPRAY ON GROWTH, YIELD AND QUALITY OF TOMATO (*Lycopersicon esculentum* Mill)

H.M.Singh* and Jitendra Kumar Tiwari

National Horticultural Research and Development Foundation–Kota

**E-mail:-hmsingh1983@yahoo.com; jktiwari17@yahoo.in*

ABSTRACT: The present experiment comprised of five levels of micronutrient and two levels of concentration. The maximum plant height, number of leaves per plant, number of flowers per plant, number of fruits per plant, fruit yield per plot, T.S.S. % and ascorbic acid (mg/100g) were found with the application of T_8 (Boric acid + Zinc sulphate + Copper sulphate @ 250 ppm each). The maximum total sugar (%) was found under T_0 (Control).

Keywords : *Tomato, boron, copper, zinc.*

Tomato (*Lycopersicon esculentum* Mill) belongs to family Solanaceae having chromosome no. 2n = 24. A large number of high yielding varieties and hybrids of tomato has been developed by universities, ICAR and other private sectors but the national average yield has not recorded as significant level one of the main reasons for this wide gap is that proper emphasis has not been given on nutritional management. Application of micronutrients has got the tremendous effects besides the use of major nutrient fertilizers to increase crop yield. Adams (1) reported that micronutrients like boron, copper and zinc if applied through foliage can also improve the vegetative growth, fruit set and yield of tomato.

Response of vegetable crops to application of small quantity of micronutrient elements has been reported by Mallick and Mathukrishnan (4). The main functions of micronutrients are to help in the photosynthesis of green plants as well as the synthesis of chlorophyll. The elements boron, copper, manganese, iron, zinc and molybdenum are classified as essential micronutrients because their requirement is relatively low but they are as essential as the larger amount of primary and secondary nutrients for plant growth and development.

The present investigation on yield and quality of F_1 hybrid tomato var. Rashmi was carried out under field conditions in the Department of Horticulture, Allahabad Agricultural Institute, Naini Allahabad (U.P.) during winter season of 2005-2006. There were a total of 11 treatments viz. T_0-Control, T_1-Boric acid @100 ppm, T_2-Boric acid @ 250 ppm, T_3-Zinc sulphate @100 ppm, T_4-Zinc sulphate @ 250 ppm, T_5-Copper sulphate @ 100 ppm, T_6-Copper sulphate @ 250 ppm, T_7-Boric acid + Zinc sulphate + Copper sulphate @ 100 ppm each, T_8-Boric acid + Zinc sulphate + Copper sulphate @ 250 ppm each, T_9-Commercial formulation (Multiplex) @100 ppm and T_{10}-Commercial formulation (Multiplex) @ 250 ppm.

Treatments were applied as faliar spray of micro-nutrients two times at 30 and 45 days after tomato seedlings transplanting which were replicated thrice in randomized block design. All cultural practises recommended for growing good crop were followed. Observations on various growth and yield parameters were recorded and analysed statistically.

The observations (Table 1) revealed at that the maximum plant height (80.40 cm) was recorded in treatment T_8 (80.40cm) followed by T_7 (77.20 cm) and T_6 (77.07 cm) whereas, the minimum plant height (66.60 cm) was recorded in treatment T_0 (control) followed by T_3 (72.07 cm). Combined application of micro- nutrient increased the plant height which might be due to the fact that zinc may serve as source of energy for synthesis of auxin, which helps in elongation of stem. Similar findings

Received : 29.12.2012 *Accepted : 31.1.2013*

were also reported by Bose and Tripathi (2). Maximum number of leaves per plant was recorded in treatment T_8 (54.40) followed by T_7 (52.33) while minimum number of leaves per plant was recorded in T_0 (41.67) followed by T_3 (48.20) and T_9 (48.73).

Maximum number of flowers per plant was recorded in T_8 (41.47) followed by T_6 and T_7 (39.07), whereas minimum number of flowers was recorded in T_0 (30.87) followed by T_3 (34.93) and T_9 (36.07). The variation in number of flowers per inflorescence might be due to enhancement in translocation of carbohydrate from the site of synthesis to storage tissue in plant and due to micronutrient combination particularly borax. Similar results have also been reported by Pandita *et al.* (5).

The maximum fruit yield per plant was observed with T_7 and T_8 (1.18 kg each) followed by followed by T_6 (1.17 kg), while minimum fruit yield per plant was recorded in T_0 and T_3 (1.09 kg each) followed by T_9 (1.10) and T_1 and T_5 (1.11 kg). The maximum TSS percentage was recorded in treatment T_8 (8.73) followed by T_7 (8.53%) while minimum TSS % was recorded in T_0 (7.87%) followed by and T_3 (7.93%) and T_9 (7.97%). The results are in agreement with the findings of Rawat and Mathpal (6).

The maximum total sugar (°Brix) was recorded with T_0 (4.53 °Brix) followed by T_1 (4.33) and T_2 (4.23), whereas minimum total sugar was recorded with T_{10} (3.83) followed by T_8 and T_9 (3.90 °Brix). The maximum ascorbic acid was recorded in T_8 (931.99 mg/100g) followed by T_7 (31.33) and T_6 (30.64), while minimum ascorbic acid was recorded in T_0 (28.08). Mallick and Muthukrishnan (4) and Chatterjee *et al.* (3) confirmed that zinc increased the ascorbic acid content.

The maximum fruit yield per ha was recorded with T_8 (375.94 q) followed by T_7 (353.77 q) and T_6 (348.03 q), whereas minimum fruit yield per ha was recorded in T_0 (291.67 q) followed by T_3 (306.94 q) and T_9 (308.64 q).

On the basis of the above result it is concluded that foliar application of boric acid + zinc sulphate

Table 1: Effect of treatments on different parameters of tomato cv. Rashmi.

Treat-ments	Plant height (cm)	Number of leaves/ plant	Number of flowers/ plant	Number of fruits/ plant	Fruit yield/ plant (kg)	Fruit yield (q/ha)	T.S.S. (%)	Total sugar (%)	Ascorbic acid (mg/ 100g)
T_0	66.60	41.67	30.87	21.53	1.09	291.67	7.87	4.53	28.08
T_1	75.07	49.27	36.60	28.07	1011	319.13	8.20	4.33	29.00
T_2	76.13	50.93	37.67	29.67	1.15	344.70	8.50	4.23	30.16
T_3	72.07	48.20	34.93	26.20	1.09	306.94	7.93	4.20	28.41
T_4	75.53	49.80	36.80	28.33	1.12	328.70	8.20	4.20	29.17
T_5	72.93	48.93	36.20	26.80	1.11	314.70	8.17	4.10	28.93
T_6	77.07	50.93	39.07	31.40	1.17	348.03	8.50	4.07	30.64
T_7	77.20	52.33	39.07	32.67	1.18	353.77	8.53	4.00	31.33
T_8	80.40	54.40	41.47	35.67	1.18	375.94	8.70	3.90	31.99
T_9	72.13	48.73	36.07	26.53	1.10	308.64	7.97	3.90	28.60
T_{10}	75.67	50.80	37.67	29.47	1.14	339.76	8.27	3.83	29.77
CD (P=0.05)	0.98	1.18	1.05	0.84	0.02	5.26	0.13	0.13	0.44

+ copper sulphate @ 250 ppm each was found superior over other treatments for growth, flowering, yield and quality of tomato.

REFERENCES

1. Adams, P. (2004). Effect of nutrition on tomato quality. Tomatoes in peat. How feed variations affect yield. *Grower,* **89** (20): 1142-1143, 1145.
2. Bose, U.S. and Tripathi, S.K. (1996). Effect of micronutrients on growth, yield and quality of tomato cv. Pusa Ruby in M.P. *Crop Res.,* Hissar, **12** (1): 61-64.
3. Chatterjee, C., Sinha, P., Sinha, Pratima and Dube, B.K. (2003). Effect of zinc on the yield and quality of tomato. *Indian J. Hort.*, **60** (1): 59-63.
4. Mallick, M.F.R. and Muthukrishnan, C.R. (1980). Effect of micronutrients on tomato (*Lycopersicon esculentum* Mill.), II. Effect on flowering, fruit-set and yield. *South Indian Hort.,* **28** (1): 14-20.
5. Pandita, M.L., Arora, S.K. and Kirti Singh (1976). Effect of plant regulators on the fruit set, early and total yield of tomato variety HS-101 during summer season. *Haryana J. Hort. Sci.,* **8** (3-4): 112-116.
6. Rawat, P.S. and Mathpal, K.N. (1984). Effect of micronutrients on yield and sugar metabolism of some of the vegetables under Kumaun Hill conditions. *Science and Culture*, **50** (8): 243-244.