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Influence of Micronutrients and Bio-fertilizers on Yield of Tomato *(Lycopersican Esculentum Mill.).*

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ABSTRACT: *Significant effect of micronutrients &bio-fertilizers was observed on weight of fruit (71-79 g), fruit length (5.83cm), volume of fruit (68.58ml), maximum number of fruits (30.86) per plant, yield per plant (1.65kg), yield per plot (38.54kg)and maximum yield per hector 415.03 q/ha were observed due to the application of 150:100:50NPK kg/ha. + 0.3% feso$_4$+B+Znso$_4$ (0.1% each) + Azatobacte+PSB. The result have shown positive response to, bio-fertilizers and micronutrients along with R.D.F.*

Key words: *bio-fertilizers, micronutrients, R.D.F., Tomato.*

INTRODUCTION

The micronutrients play major role in plant growth, boron plays vitol role in pollen tube growth and pollen germination. It is involved indirectely in nitrogen metabolism, fertilization and hormone metabolism. Boron is necessary to get good, healthy and full formed tomatoes (shanmugvel 1989). The requirement of micronutrients like Zink (Zn), Boron (B), indispensable due to their active role in plant metabolic processes involving cell wall development, respiration, photosynthesis and nitrogen fixation (Das-2000). Bio fertilizers are more appropriately "microbial inoculants". Which makes availability of nutrients that can be easily assimilated by plants. Anexperiment was undertaken to explore" . Influence of micronutrients &bio-fertilizers on yield of tomato cv parbhani Yashashri.

MATERIALS AND METHODS

The field experiment was conducted at Department of Horticulture, Marathwada Agriculturral University Parbhani. (M.S) during Kharif season (2010-11). The experiment was laid out in randomized block design with nine treatments T_1-RDF + 0.1% Feso$_4$ T_2 – RDF+0.2% Feso$_4$+ Borax(0.1% each) T_3 –RDF + 0.3% Feso$_4$ + Borax+ Znso $_4$(0.1% each), T 4- RDF + Azatobacter 2 g/ nill, T 5 – RDF + PSB 29/hill, T6 – RDF + 0.1% Feso$_4$ + Azatobacter+PSB, T7- RDF+ 0.2 % Feso$_4$+B(0.1% each)+ Azatobacter+ PSB , T9- control (Recommended dose of NPK) each treatment was replicated for three times.

The recommended dose of fertilizer used for tomato was 10:100:50 kg. ha. The half dose of nitrogen, full dose of phosphorus and potassium were applied at the time of transplanting. The remaining dose of nitrogen was applied 30 days after transplanting. The spray of micronutrients was given using hand sprayer at an enterval of 15 days after transplanting of crop. The dose of application of bio-fertilizers was 2 g per plant hill.

These were applied to the plot at the time of transplanting and irrigation was given. The yield attributesweight of fruit (g|, length of fruit (cm), volume of fruit (ml), number of fruits, yield per plant (kg), yield per plot (kg) yield per plot (kg) were recorded and the data were statistically analyzed (panse & sukhatme, 1967).

RESULTS & DISCUSSION

The data with respect of yield affected by various treatment are presented in table 2 Significant differences due to treatment existed due to application of micronutrients &bio-fertilizers . Maximum weight of fruits (71.69g) was recorded in treatment T8. This

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Table 1
Treatment details

Tr. No.	*Treatments*
T1	RDF + 0.1% $Feso_4$
T2	RDF + 0.2% $Feso_4$ + Borax (0.1% each)
T3	RDF + 0.3% $Feso_4$ + Borax + $Znso_4$ (0.1% each)
T4	RDF + Azatobacter
T5	RDF + PSB
T6	RDF + 0.1% $Feso_4$ + Azatobacter + PSB
T7	RDF+ 0.2 % $Feso_4$ + B (0.1% each) + Azatobacter + PSB
T8	RDF + 0.3% feso4 + B + Znso4) (0.1% each) + Azatobacter + PSB
T9	Control (RDF) 150:100:50NPK kg/ha

treatment was statistically at par with treatment ,T7(69.59g), minimum weight of fruit (58.05g) was recorded in control which was statistically at per with treatment T1&T2. Similar results were recorded with maximum length of fruit (5.83cm) in treatment T8 which was statistically at per with treatment T7&T3.

Maximum volume of fruit (68.58ml) was recorded in treatment T8, minimum volume of fruit (56.54ml) was recorded in treatment, T9, which was statistically similar with treatment T1 (RDF + 0.1% feso4) maximum number of fruits per plant were produced by the treatment T8 (30.86) followed by treatment T7 (29.74), T6 (28.66) and T4 (28.20). These treatment were at par with each other and significantly superior over all other treatments. The highest yield per plant (1.65kg) was rewarded in treatment. T8. The next better treatment in this regard were T7 (1.63kg) and T6 (1.50kg) which are at par with each other. The data pertaining to the yield per plot persented in table reveald that the treatment T8 (38.54kg) produced significant higer yield per plot over rest of treatment.

The next better treatment in this regard were T7 (36.30kg), T6 (34.44kg) and T4 which were at par each other The treatment T8 produced maximum yield per hectare (415.0.3q/ha) which was significantly superior over control treatment T9 (359.87q/ha). The treatment T7(408.29q/ha). T6 (396.41q/ha), T4 (391.21q/ha) were satistically at par with treatment T8 (RDF + 0.3% feso4+B+ Znso4) (0.1% each) + Azatobacter +PSB. Significantly maximum fruit weight (71.69gm) length of fruit (5.83cm) & volume of fruit (68.58ml) were recorded by application of RDF + 0.3% feso4 + b + znso4 (0.1% each) + azatobacter + PSB. The increase in fruit weight & length night be due to significantly increased vegetative growth produced more photo synthesis which was diverted for nourishment of large sized fruit and it also increased metabolism of carbonydrates in oliage. micronutrients &bio-fertilizers pay a key role in photosynthesis and plant metabolism, similar results were reported by sing & verma (1991), Sood & Sharma (2004).

The maximum number of fruits per plany, (30.86) & maximum yield per plant (1.65kg) were obtained with Treatment T8. This might be due to fact that the micronutrients, boron enhanced the movement of suger borate complex form the leaves to the fruit and bio-fertilizers harper atmospheric nitrogen with the help specialized soil micro-organisms & contribute towards the nitrogen of the plants & ultimately increased fruit yield in tomato. Thease results are in agreement with those of patil *et al.* (2008), Narayana *et al.* (2007), Basvaraje shwari *et al.* (2008).

The treatment T8 (RDF + 0.3% feso4 + B + znso4) (0.1% each) + Azatobacter + PSB) produced

Table 2
Influence of micronutrients and biofertilizers on tomato

Tr. No.	*Treatments*	*Wt. of Fruit (g)*	*Length of Fruit (Cm)*	*Volume of Fruit (Ml)*	*Number of Fruit/ Plant*	*Yield Per Plant (Kg)*	*Yield Per Plot (Kg)*	*Yield Per Ha(q)*
T1	RDF + 0.1% $Feso_4$	60.26	5.56	58.37	22.66	0.95	27.05	368.36
T2	RDF + 0.2% $Feso_4$ + Borax (0.1% each)	61.78	5.53	60.26	24.53	1.02	28.60	373.42
T3	RDF + 0.3% $Feso_4$ + Borax + $Znso_4$ (0.1% each)	63.25	5.76	62.16	26.13	1.17	30.49	379.93
T4	RDF + Azatobacter	67.85	5.63	64.20	28.20	1.35	33.22	391.21
T5	RDF + PSB	65.91	5.60	63.34	27.00	1.32	31.59	381.16
T6	RDF + 0.1% $Feso_4$ + Azatobacter + PSB	67.94	5.66	65.32	28.66	1.50	34.44	396.42
T7	RDF+ 0.2 % $Feso_4$ + B (0.1% each) + Azatobacter + PSB	69.59	5.80	67.42	29.74	1.63	36.30	408.29
T8	RDF + 0.3% feso4 + B + Znso4) (0.1% each) + Azatobacter + PSB	71.59	5.83	68.58	30.86	1.65	38.54	415.03
T9	Control (RDF)	58.05	5.53	56.54	22.60	0.95	26.70	359.87
	S.E. + _	0.382	0.041	1.518	0.337	0.008	1.641	11.23
	C.D. at	5% 1.146	0.123	4.545	1.001	0.024	4.912	33.62

significantly higer yield per plot (38.54kg), maximum yield (415.03q/ha). This might be due to micronutrients take part in active photosynthesis and bio-fertilizers fixes atmospheric nitrogen. Some phosphatic bio-fertilizer (PSB) help yhe plant in getting fixed phosphorus available in soil resulting in increase the weight of fruits & yield per hector similar results were also obtained by prasad *et al.* (1997), Patil *et al.* (2008) in tomato.

REFERENCES

Baig, A, and Madalgiri, B.B. (1989), Stidies on planting date, nitrogen fertilization and azotobacter inoculation on rainfed tomato. Mysore J. *Agric. Sci.,* 23(3); 427-428.

Basavarajeshwari, C.P., Hosamani, R.M. Ajjappalavara P.S. Naik, B.H., Smitha, R. and Ukkund, K.C. (2008), Effect of foliar application of micronutrients on growth and yield components of tomato (*Lycoperscon esculentum Mill.). Karnataka J. Agric. Sci.,* 21(3); 428-430.

Das, D.K. (2000), In micronutrients: Their behavior in soil and plants. *Kalyani Publishers,* New Delhi, 307.

Habashy, N.R., Zaik, R.N. and Awatef, A.M. (2008), Maximizing tomato yield and its quality under salinity stress in a newly reclaimed soil. *J. applied Sci. Res.,* 4(12): 1867-1875.

Narayan S.N. Ahmad, S.M. and Khan, S.H.(2007), Response of tomato hybrid SH-TH-I to biofertilizer application under temperate conditions. *Haryana J. Hort. Sci.,* 36 (3&4): 419-420.

Patil B.C. Hosamani, R.M. Ajjappalavara, P.S. Naik, B.H. Smitha, R.P. and Ukkund, K.C. (2008), Effect of folier application of micronutrients on growth and yield components of tomato *(Lycopersican esculentum Mill.). Karnataka J. Agric Sci.,* 21 (3): 428-430.

Prasad, K.K., Chowdhary, B.M. and Kumar A. (1997), Response of tomato *(Lycopersican esculentum Mill.*) application in *Chotanagpur region. J. of Res. Bisra Agirl. Univ.,* 9(2); 145-147.

Singh, S.and Tiwari, R. S. (1993), Effect of micronutrients on yield of quality of onion *(Allium cepa L.) cv. Red Pusa. Prog. Hort.,* 25 (1-2): 26-30.

Panse, V.G. and P.V. sukhatme (1985), "Stastistical method for Agricultural works." *ICAR, New Delhi.*