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Research Note

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Effect of Bio-fertilizer and nitrogen on quality of tomato cv. GT-2

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Tomato is an important vegetable crop to grower, consumer and processing industry. It is known for its outstanding nutrient value, is second most commonly grown vegetable in India. The red pigment in tomato fruit lycopene is now being considered as the world's most powerful natural anti-oxidant. While very few attempts have been taken to standardize the nutritional requirement of tomato. Hence, the present experiment was carried out to fine out the influence of biofertilizer and nitrogen on tomato.

A field trial was conducted at the college farm, N.M. College of Agriculture, Navsari Agricultural University, Navsari during *Rabi* 2005-06. The soil of experimental field had a pH of 7.7; with available nitrogen 160 kg/ha, available phosphorus 40.02 kg/ha, available potash 384.05 kg/ha. The experiment was laid out in Randomized Block Design (RBD) replicated with various biofertilizer treatments with recommended dose of nitrogen. The data on days to 50 per cent flowering, diameter of fruit, fruit weight, no of fruits per plant, fruit yield, TSS, acidity and ascorbic acid (mg/100g) are presented in Table 1 after statistical analysis.

Minimum days to 50 per cent flowering (41.83) equally recorded in T_3 and T_9. It may be due to extended vegetative phase of the plant, by availability of higher inorganic nitrogen (Renuka and Sanker, 2001).

Maximum value of polar and equatorial diameter of fruit (5.42 and 15.75 cm), respectively was found in T_{10} which at par with T_{11}. It might be due to biofertilizer produce growth promoting substances, *viz.*, auxin, GA_3 and cytokinin, which contribute in increasing the diameter (Pandey and Kumar, 1989).

Maximum fruit weight was recorded in T_{11}. It might be due to *Azotobactor*, *Azospirillum* effects in N_2 fixation and synthesized plant growth substances which promote the hormone and protein, enzymes and other factors that improve uptake of essential nutrients by plants (Pandey and Kumar, 1989).

T_{10} gave maximum fruit yield per plant and per hectares which was at par with T_{11}. The possible reason for fruit yield might be associated to better inorganic nitrogen utilization in the presence of bio-fertilizers, which enhanced biological N_2 fixation for better development of root system and possible higher synthesis of plant growth hormones (Gajbhiye *et al.,* 2003).

TSS was found non-significant but positive trend was found in T_{10}. Minimum acidity (0.36) found in T_8 which was at par with T_{10} and maximum ascorbic acid (32.67%) recorded in T_{10} which was at par with T_{11}.Biofertilizers enhanced the photosynthetic and metabolic activities resulting in the synthesis of higher amount of acids, metabolites and glucose. The produced reserves may contribute to synthesis of TSS, acidity and ascorbic acid (Kumaran *et al.,* 2009).

Table 1 : Effect of bio-fertilizer and various levels of nitrogen on quality parameters of tomato cv. GT-2

Treatments	Days to 50% flowering	Diameter of tomato		Fruit weight (g)	No. of fruit per plant	Fruit yield per		TSS	Acidity (%)	Ascorbic acid (mg/100 g)
		Polar (cm)	Equatorial (cm)			Plant (kg)	Hectare (t)			
T_1- 100% RDF	46.83	4.65	14.12	33.40	40.87	1.29	23.77	4.50	0.42	27.02
T_2- 75% RDN	46.62	4.37	13.20	28.95	39.22	1.11	19.44	4.05	0.43	24.38
T_3- 50% RDN	41.83	4.12	13.17	26.90	35.22	1.04	21.96	3.90	0.43	23.48
T_4- 100% RDN + *Azospirillum*	46.00	4.63	14.12	34.38	43.42	1.35	27.59	4.27	0.41	27.65
T_5-75% RDN + *Azospirillum*	46.122	4.63	13.80	31.41	43.30	1.30	24.14	4.03	0.43	26.00
T_6-50% RDN + *Azospirillum*	45.82	4.12	13.12	27.35	36.88	1.20	25.37	4.13	0.42	25.68
T_7-100% RDN + *Azotobactor*	45.83	4.65	14.03	33.09	44.02	1.34	25.92	4.43	0.45	27.08
T_8-75% RDN + *Azotobactor*	43.12	4.17	13.53	30.17	43.55	1.25	28.51	4.52	0.36	27.35
T_9-50% RDN + *Azotobactor*	41.83	4.52	13.53	28.10	37.10	1.21	24.07	4.07	0.42	25.80
T_{10}- 100% RDN + *Azospirillum* + *Azotobactor*	47.50	5.42	15.75	28.43	46.23	1.64	35.55	4.03	0.40	32.67
T_{11}- 75% RDN + *Azospirillum* + *Azotobactor*	46.05	5.22	15.28	36.85	44.08	1.49	29.62	4.57	0.43	31.67
T_{12}- 50% RDN + *Azospirillum* + *Azotobactor*	46.02	4.55	13.75	29.22	42.28	1.27	25.55	4.12	0.42	27.30
C.D. (P=0.05)	NS	0.73	1.61	4.24	6.54	0.27	6.59	NS	0.04	2.59

NS=Non-significant

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