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Evaluation of nine genotypes of determinate tomato under south Gujarat conditions

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SUMMARY

Field experiment was conducted to evaluate the nine genotypes of determinate tomato under south Gujarat conditions at Regional Horticultural Research Station of Navsari Agricultural University, Navsari as voluntary centre during *Rabi* season of 2009. A randomized bock design was used with three replications, which included nine genotypes of tomato. The tomato genotypes were transplanted with care in the field during the month of November 2009 at the spacing of 60 cm x 40 cm. Significant difference was observed among the genotypes for yield attributing parameters. The genotype GT-2 was found significantly superior than all the genotypes under study, recorded the fruit yield of 73.13 t/ha. The next best genotype was ATL-01-19 (68.41 t/ha).

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Key words : Tomato, Genotypes and yield

Tomato (*Lycopersicon esuculentum* Mill.) is one of the most versatile crops in the world because of its fast and wide climatic adaptation. It is universally treated as "protective food" and provides almost all types of vitamins and minerals in quite fair amount. (Chattopadhyay *et al.*, 2007).

It belongs to family Solanaceae and is a unique vegetable crop consumed as fresh and in processed form, across the length and breadth of the country, covering an area of 5.99 lakh ha with a production of 111.48 million tones. The crop shares about 7.37% of the total area under vegetable cultivation and 8.52% of the total production. It tops the list of canned vegetables. In Gujarat it occupies an area of 30,526 ha with a production of 7,46,203 metric tones. (Salaria and Salaria, 2009).

There is wide variation among tomato genotypes for different traits. Genotypic variation in desirable component have greater potential to affect the quantity and quality of the tomato fruit (Ram, 1998 and Stevens, 1986).

Proper and systematic evaluation of genetic resources is essential to understand and estimate the genetic variability, heritability and genetic advance. The breeding strategy involves generating variable germplasm with different sources of resistance and selection of superior genotypes for use in hybridization. With this aim, tomato genotypes of diverse origin were evaluated for yield and quality (Pradeepkumar *et al.,* 2001).

The goal of this type of trial is to evaluate genotypes for local adaptation and to identity genotypes with high yield and fruit quality under a range of geographic areas and environmental conditions.

The knowledge of genetics of various traits is very essential for a breeder to plan breeding program for getting efficient results in the succeeding generations. Colour of fruits, fruit shape, position, fruit apex, fruit length and thickness, pedicel length, number of locules/fruit, T.S.S % etc. are considered as important characters in tomato improvement work. It provides valuable guidance based on the information generated by conducting the IET/SSVT/ LSVT/AVT trails on a particular crop on large scale to the research workers, olericulturist and plant breeder for their breeding program in other regions. (Chadha, 2002).

MATERIALS AND METHODS

Total nine genotypes with three checks of tomato

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Table 1 : Evaluation of nine genotypes of determinate tomato under south Gujarat conditions (*Rabi* 2009)

Sr. No.	Genotypes evaluated	Weight of five fruits (g)	Fruit length (cm)	Fruit diameter (cm)	No. of locules/ fruit	TSS (%)	Fruit yield (t/ha)
1.	ATL-01-19	519.86	4.92	6.13	5.00	4.50	68.41
2.	HADT-294	600.12	4.82	6.33	4.67	4.64	58.73
3.	VR-35	379.76	4.73	5.13	3.67	3.30	49.58
4.	PAU-2371	439.68	5.41	4.36	3.00	5.48	52.19
5.	VTG-89	420.34	4.82	5.30	4.00	4.80	39.95
6.	VTG-90	219.74	4.84	4.10	2.00	4.53	48.33
7.	DVRT-2 (C)	599.91	4.60	6.16	5.33	4.30	56.27
8.	CO-3 (C)	320.43	4.30	4.97	3.00	3.70	48.72
9.	GT-2 (C)	239.83	4.74	4.42	2.00	3.90	73.13
	S.E.±	6.46	0.13	0.13	0.34	0.21	61.66
	C.D. (P=0.05)	18.23	0.37	0.36	0.95	0.58	18.48
	C.V. %	2.69	4.74	4.26	16.13	8.22	19.41

determinate were evaluated in field conditions at Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry of Navsari Agricultural University, Navsari as voluntary centre during the *Rabi* season of 2009. The experimental material *i.e.* seed packets of all the genotypes were allotted from the Project Coordinator, AICRP (Vegetable Crops), IIVR, Varanasi, Uttar Pradesh (India) for conducting the trial. The genotypes were transplanted with great care in the field during the month of November 2009 in randomized block design with three replicates, at the spacing of 60 cm x 40 cm. Details of genotypes are given in Table 1.

For recording field observations on yield contributing parameters, five randomly chosen plants were tagged from each genotype in each replication were used. Fruit yield data were recorded picking wise and calculated on hectare basis.

The research data on yield attributing characters were subjected to statistical analysis as per the method suggested by Panse and Sukhatme (1984).

RESULTS AND DISCUSSION

The performance of various genotypes of tomato under south Gujarat conditions is presented in Table 1. Analysis of variance revealed highly significant differences among the genotypes for all the yield attributing characters under study indicating considerable amount of variability among the genotypes tested.

Among the different genotypes, maximum weight of 5 fruits was measured for the genotype HADT 294, (600.12 g) whereas, for VTG-90 genotype it was 219.74 g.

For the fruit length trait, the differences among the genotypes were observed significant. The highest value (5.41 cm) and lowest value (4.30 cm) was observed for the genotypes PAU-2371and CO-3, respectively.

Fruit diameter character showed significant differences among the genotypes. Significantly the highest value (6.33 cm) and lowest value for fruit diameter (4.10 cm) was noticed for the genotypes HADT-294 and VTG-90, respectively.

The variation in number of locules/fruit, which ranged from minimum 2.00 to maximum 5.33 exhibited by the genotypes GT-2 as well as VTG-90 and DVRT-2, respectively.

The experimental results indicated that TSS revealed significant differences among the genotypes. Significantly the highest TSS (5.48%) was recorded in PAU-2371 followed by VTG-89. Lowest TSS (3.3%) was recorded with the genotype VR-35.

Among the various genotypes the fruit yield exhibited significant differences. Significantly the highest fruit yield value was recorded for GT-2 (73.13 t/ha) as well as ATL-01-19 (68.41 t/ha), while it was recorded minimum in VTG-89 (39.95 t/ha).

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