

EVALUATION OF TOMATO VARIETIES IN BLACK SOILS OF WESTERN ZONE OF ORISSA

Successful cultivation of tomato (*Lycopersicon esculentum* Mill.) is based essentially upon choice of suitable varieties for a particular location. Although several high yielding varieties and hybrids have been developed during the last decade, their potentiality need to be tested under various agro-climatic conditions. Further bacterial wilt (*Pseudomonas solanacearum*) in tomato has been identified as the main constraint in its production (Joshi *et al.*, 1998 and Tiwari, 1999). The present study was undertaken to evaluate the performance of some wilt resistant/tolerant genotypes for yield and its components along with some popular varieties to find out the desirable ones for this western undulating zone of Orissa.

The experiment was laid out in a randomized block design with three replications at the Regional Research Station, Bhawanipatna during rabi 1997-98 and 98-99. Eighteen genotypes of tomato were tested which included 12 wilt tolerant lines (eight from the All India Coordinated Vegetable Improvement Project, Bhubaneswar viz. Utkal Pallavi, Utkal Deepti, Utkal Kumari, Utkal Urvasi, BT 3, BT 12-2, BT 17 and BT18 and four from the Asian Vegetable Research and Development Centre (AVRDC) Taiwan, i.e. ET 4, ET 14, ET 27 and ET 35. Four week old healthy seedlings of each genotype were transplanted during the first week of November every year at a spacing of 60 x 45 cm in a plot of 3.6 x 2.7 m. Normal cultural practices were adopted to raise the crops successfully. Five plants were selected at random in each plot every year to record the observations on plant height, number of branches, fruits/plant, days to first harvest and average fruit weight. The yield was noted on plot basis. The mean data over the years were statistically analyzed following standard procedure.

The pooled analysis of variance revealed significant mean square estimates for all the characters indicating sufficient diversity among the genotypes. The means squares due to environment (year) as well as genotype x environment interaction were also significant for all the attributes except number of fruits/plant. This not only suggested the extent of

variation over the years of investigation but also explained the differential response of genotypes to environmental fluctuation.

The mean performance of the genotypes over the years is presented in Table 1. The shortest plant (38.67 cm) was noticed in Pusa Early Dwarf followed by Utkal Deepti and Utkal Pallavi while the tallest plant (93.67 cm) was manifested by the exotic line ET 35. The number of branches /plant was maximum in Arka Vikas (13.73) and minimum in ET 27 (4.97) followed by Pusa Early Dwarf, ET 4, Pusa Ruby and ET 35. The variety Pusa Early Dwarf was found to be the earliest where the first harvesting started 61.78 days of planting followed by Arka Saurav and Pusa Ruby. On the other hand, Roma took 89.23 days for the first harvest and was regarded late followed by Punjab Chhuhara and ET35.

A wide range of variation was marked for number of fruits/plant and average fruit weight. Maximum number (75) of small sized fruits (29.83g)/plant were borne by Utkal Deepti followed by Utkal Pallavi (73, 30.67g), while the exotic genotype ET 35 registered minimum number (23) of large sized fruits (92.67g) /plant which elucidated an inverse relationship between number of fruits / plant and average fruit weight. It was observed that many early varieties such as Pusa Early Dwarf, Pusa Ruby, Utkal Pallavi, Utkal Kumari and Utkal Deepti produced smaller fruits than the late maturing like ET 35, Roma, Punjab Chhuhara, and ET 27 depicting that maturity was proportional to fruit weight.

The fruit yield ranged from 24.13 to 39.20 t ha⁻¹. The highest yield was obtained from Utkal Kumari (39.20 t ha⁻¹) that was at par with BT 17 (38.97 t ha⁻¹), Roma (38.88 t ha⁻¹), BT 12-2 (38.73 t ha⁻¹), Utkal Pallavi (37.87 t ha⁻¹), BT 18 (37.27 t ha⁻¹), Punjab Chhuhara (36.48 t ha⁻¹) and Utkal Deepti (36.35 t ha⁻¹). On the contrary, the lowest yield was realised from Arka Sourav (24.13 t ha⁻¹) followed by ET 35 (27.60 t ha⁻¹). The higher yield of Utkal Kumari, Utkal Pallavi, Utkal Deepti and BT 18 might be attributed to more number of smaller fruits, whereas that of others might be

attributed to relatively higher number of medium sized fruits. Among the high performing genotypes, Roma and Punjab Chhuhara have proved their high yielding potentiality (Wahab, 1988; Joshi *et al.*, 1998 and Anon., 2000). However, they are susceptible to wilt. Out of them, the performances of Utkal Kumari (BT 10), Utkal Pallavi (BT 1) in respect of wilt tolerance and yield potential have been tested

and recognized in several locations. (Tiwari, 1999 and Anon., 2000). Therefore, Utkal Kumari and Utkal Pallavi are advocated for popularization among the tomato growers of western undulating zone. Other genotypes need further testing under diverse environments for their adaptability. Nevertheless, they are the potent breeding material to be exploited in future improvement programme.

Table 1. Mean performance of tomato genotypes over 2 years (pooled)

Varieties	Source	Character						
		Plant height (cm)	No. of branches /plant	Days to first harvest	No. of fruits / plant	Average fruit wt. (g)	Yield (t ha ⁻¹)	Incidence of wilt (%)
Utakal Pallavi	Bhubaneswar	41.50	8.32	71.72	73.00	30.67	37.87	3.53
Utkal Deepti	Bhubaneswar	39.50	9.47	75.45	75.00	29.83	36.35	2.75
BT 3	Bhubaneswar	44.33	6.87	77.35	52.67	39.67	34.12	6.50
BT 17	Bhubaneswar	47.00	11.82	83.57	58.67	43.83	38.97	2.85
Roma	Introduction	54.33	10.52	89.23	45.33	52.00	38.88	24.27
Punjab Chhuhara	Ludhiana	46.50	6.58	86.45	41.33	45.83	36.48	26.53
Pusa Early Dwarf	Delhi	38.67	5.07	61.78	38.67	35.00	33.65	52.57
Utkal Kumari	Bhubaneswar	45.33	12.62	72.38	63.00	34.00	39.20	8.25
Utkal Urvasi	Bhubaneswar	59.00	8.07	72.52	33.17	58.67	34.58	9.50
BT 12-2	Bhubaneswar	45.67	8.78	76.42	44.50	57.17	38.73	7.23
BT 18	Bhubaneswar	50.50	7.95	78.67	53.50	35.50	37.27	3.27
ET 4	Taiwan	57.00	5.22	72.75	31.67	69.50	31.32	4.50
ET 14	Taiwan	51.00	7.40	67.35	51.50	43.50	32.15	4.23
ET27	Taiwan	57.17	4.97	81.62	28.83	45.50	27.85	3.80
ET 35	Taiwan	93.67	5.73	84.57	22.83	92.67	27.60	3.50
Pusa Ruby	Delhi	46.17	5.63	65.25	45.00	39.33	29.80	44.75
Arka Saurav	Bangalore	80.50	11.00	63.78	26.83	78.17	24.13	25.50
Arka Vikas	Bangalore	72.67	13.73	68.45	30.83	91.67	27.72	22.25
SE(m) ±		1.83	0.29	2.10	1.81	1.89	1.25	
CD(0.05)		5.19	0.83	5.40	5.11	5.30	3.54	

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