

# A New Tomato cv L-15 for North Karnataka\*

B.B.MADALAGERI AND P.R.DHARMATTI

Department of Horticulture, UAS, Dharwad-580 005

(Received December, 1989)

**Abstract :** Series of investigations on tomato cv L-15 were carried out from 1987 to 1989 at Department of Horticulture, UAS, Dharwad. The cultivar L-15 was found to have field resistance to leaf diseases *Alternaria*, *Septoria* and *Stemphyllium*. The fruit yields were far superior (25-30 t/ha) over the conventional variety (Pusa Ruby). It had better shelf life (21 days) and transport quality. It performed better to even low fertilizer levels under rainfed conditions. The farm trial results over two years in different districts of North Karnataka revealed 43 per cent increase in yield over Pusa Ruby and the farmers were happy about its performance.

## Introduction

Tomato (*Lycopersicon esculentum* Mill) is a favourite vegetable crop which is cultivated on 11,000 ha in eight northern districts of Karnataka. Hitherto Pusa Ruby was a popular variety. Owing to its susceptibility to diseases, poor and unattractive fruit quality and shelf life, tomato growers are switching over to F<sub>1</sub> hybrids. But, F<sub>1</sub> hybrids need intensive management, involve high cost and are not within the reach of common grower. Therefore, it was necessary to develop a new cultivar of tomato that could yield well under low management practices with high degree of resistance and yet have better and attractive fruit qualities.

## Material and Methods

Number of experiments were carried out on L-15 tomato, a derivative of the cross CL 1131-0-0-38-40 x NTDR-1, developed for bacterial wilt resistance (Madalageri, 1985) at the Department of Horticulture, UAS Dharwad. Initial yield evaluation and disease screening test was conducted in kharif 1987 with 60 tomato germplasms collected

from abroad (USA, AVRDC, Taiwan, Netherlands and Bulgaria) and different institutes in India. Promising entries were enhanced to subsequent tests in winter and summer of 1987-88. Large scale demonstrations/field experiments were laid out using Pusa Ruby/Arka Vikas as checks. Suitability of L-15 to rainfed cultivation and low input management was studied during winter 1988. Performance of L-15 in farmers, field and its acceptability was tested by conducting farm trials in different districts.

## Results and Discussion

Main season tomatoes in north Karnataka suffer from three leaf diseases viz., *Stemphyllium*, *Septoria* and *Alternaria*. The disease screening of tomato entries (Table 1) revealed that the genotype L-15 was one among 22 showing field resistance to all the three leaf diseases. This was confirmed by subsequent studies (Table 2) on the selected genotypes carrying good horticultural base (fruit yield, shelf life and quality). Apart from registering high yields, L-15 had high TSS and better shelf life (around 18 days) over

\* Outcome of the Project "Agricultural Biotechnology" of senior author.

Table 1. Reaction of Tomato cultivar L-15 to leaf diseases

Stemphylium	Septoria	Alternaria
<b>Field Resistance</b> : LE-208, 85/F <sub>5</sub> -20-6, 86/(T)/F <sub>4</sub> -2, 86/F <sub>5</sub> -15-13, 86/F <sub>5</sub> -17-1, Florentia, L-15, Sunory, Perfecto, S-IV 4-1-4-6 S(T), IV-135-2M-F <sub>6</sub> , 79015-2-2-1F <sub>6</sub> , N-118-3-B <sub>6</sub> , UC-82 B, Horizon, N-229 8MF <sub>6</sub> , 79B 1390, PL-422397, 79B703, Maruthan, LE-79, CA-1, Rupali, ACC-2, ACC-3.	LE-208, 86/(T)S4-2, 86/F <sub>5</sub> -15-1-3, 86/F <sub>5</sub> -17-1, Florentia, Sunory, L-15, Perfecto, F <sub>3</sub> -13-2, S-II-14-1-4-6, N-135-2MF, N-118-3-F <sub>6</sub> , UC-82-B, Horizon, N-229, 8MF <sub>6</sub> , 79B-1390, PL-422397, 79B 13703, Moruthan, LE-79, CA-1, Rupali, ACC-2.	L-15, LE-208, 86/F <sub>4</sub> -2-2-, 86/(T)/F-2, 86/F <sub>5</sub> -15-1-3, 86/F <sub>5</sub> -17-1, Florentia, Perfecto, F II-14-1-4-6F <sub>6</sub> , N-135-2MF <sub>6</sub> , N-118, -3-F <sub>6</sub> , UC-82 B, N-229, 8MF <sub>6</sub> , 79B 1390. PI-422397, 79B703, Moruthan, Rupali, ACC-2.
<b>Tolerance</b> - GKVK-24, 86/F <sub>5</sub> -20-6, 86/F <sub>5</sub> -20-2, 86/F <sub>5</sub> -18/5, F <sub>3</sub> -12-12, C-37, 86/F <sub>5</sub> -17-4, 86/(19) F <sub>4</sub> -F <sub>4</sub> , F <sub>3</sub> -10-3, UC-204 B, Arka Sourab, AVRDC, 86/F-20-4, 86/F <sub>5</sub> -20-3.	86/F <sub>5</sub> -2-11, 86/F <sub>5</sub> -18/5, F <sub>3</sub> -10-3, C-37, 86/F <sub>5</sub> -20-6, 86/F <sub>4</sub> -2-2, GKVK-24, AVRDC, Arka Sourab, 86/F <sub>5</sub> -20-2, 86/F <sub>5</sub> -20-3, F <sub>3</sub> -12-12, N-229, -8MF <sub>6</sub> , UC-204 B, 790/5-2-2-1- F <sub>6</sub> , UF145B-7879, F <sub>3</sub> -10-3, 86/(T)F <sub>4</sub> -4 86/F <sub>5</sub> -17-4.	86/F <sub>5</sub> -20-6, 86/F <sub>5</sub> -18/5, F <sub>3</sub> -10-3, F <sub>3</sub> -12-12, Horizon, C-37, LE-79, CA-1, AVRDC, AVRDC (Alcobasa), 86/F <sub>5</sub> -20-2, 86/F <sub>5</sub> -20-3, N-229, 8MF <sub>6</sub> ACC-3, Arkasourab, 86/F <sub>5</sub> -17-4, 86/(T)-F <sub>4</sub> , F <sub>3</sub> -13-2, UF145B-7879, UC-204 B, 70015-2-2-IF <sub>6</sub> .
<b>Susceptible</b> - Pusa Ruby, B-1, Karnataka Hybrid, S-22, Co-3, 86/F <sub>4</sub> -22, 86/F <sub>4</sub> -2-2, AVRDC (Alcobasa), Liberator, F <sub>3</sub> -10-4, L15-8, Castlerock, Sonali.	Pusa Ruby, B-1, Karnataka Hybrid S-22, Co-3, 86/F <sub>4</sub> -22, Liberator, F <sub>3</sub> 10-4, VS-28, Castlerock, Sonali.	Pusa Ruby, B-1, Karnataka Hybrid, S-22, Co-3, 86/F <sub>4</sub> -2-2, Liberator, F <sub>3</sub> -10-4, US-28, Castlerock, Sonali.

Table 2. Performance of L-15 for horticultural traits

Genotypes	Fruit yield/plant (kg)			Pericarp thickness (mm)	TSS	Shelf life (days)	Disease Index (PDI)	
	1987	1988					Altern- aria	Sept- oria
		Winter	Summer					
LE-208	1.77	2.00	1.24	3.46	7.15	14.75	58.83	51.96
L-15	0.80	2.08	1.49	5.02	8.07	18.50	38.32	53.38
Arka Vikas	0.40	2.06	1.37	3.61	7.47	13.00	40.62	45.57
LE-79	0.54	2.02	1.32	4.10	8.96	18.00	41.48	42.53
UC 204 B	0.54	2.17	1.52	5.47	8.43	21.50	40.14	43.58
22-3	-	2.00	1.27	5.08	7.81	21.00	42.66	48.26
C.D. at 5%		0.07	0.163	0.097	0.30	2.30	NS	Ns

Arka Vikas (Check) due to thick pericarp (5.02 mm). The results of the large scale demonstration plots (Table 3) were illustrative of the superiority of L-15 over hitherto popular check (Pusa Ruby). It had nearly 4 times higher yield with few locules, thicker pericarp (7.0 mm) and 3 times better storage life. It was tolerant/resistant to many leaf diseases. The data from farmers' field trials (Table 4) are conclusive of high yielding ability of L-15 even to the extent of 70 per cent more than Pusa Ruby. The farmers were convinced about long keeping quality and market acceptability owing to attractive fruits. Therefore, there was a higher demand for seeds of L-15 and the seed multiplication programme need to be channelised.

The production technology for L-15 with regard to nutrient requirement under rainfed condition suggested that when L-15 was planted at a spacing of 75 cm x 75 cm and exposed to various fertilizer doses, it did well even at lowest level of 30:25:15 kg NPK/ha (Table 5) meaning L-15 responds to low cost management. Thus, L-15 is handy to small and marginal farmers too.

Table 3. Comparative performance of L-15 with Pusa Ruby in Demonstration plots (two) at Dharwad

Sl. No.	Character	Pusa	L-15 Ruby
1.	Plant height (cm)	45.60	39.40
2.	Number of branches	7.40	3.80
3.	Plant spread (cm)	65x65	61.20x60.60
4.	Leaf area (cm <sup>2</sup> ) (terminal leaflet)	12.00	50.00
5.	Seedling establishment (%)	60-68	95-100
6.	Disease Reaction :		
	i) Septoria	Susceptible	Resistant
	ii) alternaria	Susceptible	Tolerant
	iii) Stemphyllium	Susceptible	Resistant
	iv) Bacterial wilt	Susceptible	Resistant
7.	Number of fruits/plant	44.30	58.00
8.	Average fruit weight (g)	50.00	80.00
9.	Yield (t/ha)	6.60	25.70
10.	Locules/fruit	5-6	2-3
11.	Seeds/fruit	140-151	90-98
12.	Rind Thickness (mm)	2.0	7.0
13.	TSS	4.4	4.8
14.	pH	4.3	4.1
15.	Storage life (days after ripening)	4-5	12-18
16.	Fruit surface	Ribbed	Smooth

**Table 4. Results of farm trials (fruit yield kg/ha)**

District	Year	No. of trials	L-15	Pusa Ruby	Yearwise increase in yield over check (%)	Remarks
Belgaum	1987 Kharif	1	20,000	12,500		
		2	22,500	14,000		
		3	22,000	14,000	52.69	L-15 very much accepted by farmers
		4	25,000	15,000		
		5	24,250	19,000		
	1988 Kharif	1	30,000	15,000		L-15 very much accepted by farmers
		2	24,000	15,000	69.34	
		3	20,000	13,700		
	1988 Summer	1	6,000	4,750	7.72	Low yield due to seasonal variation
		2	16,029	15,700		
		3				
		4				

In view of the foregoing results, the tomato cultivar L-15 has a great promise for Northern Karnataka.

#### Reference

MADALAGERI, B.B., 1985, wilt resistance breeding in tomato and egg plant. Ann. Report UAS, Bangalore.

**Table 5. Response of Tomato cultivar L-15 to nutrient levels under rainfed condition**

Fertilizer levels (kg/ha)	Yield (t/ha)	TSS	pH
N : P <sub>2</sub> O <sub>5</sub> : K <sub>2</sub>			
30 : 25 : 15	40.30	39.8	4.05
60 : 50 : 30	40.57	41.5	4.1
90 : 75 : 45	37.15	42.0	4.1
120 : 100 : 60	37.71	41.0	4.0
250 : 250 : 250	32.81	46.1	4.05
S.e.m ±	1.52		
C.D. at 5%	NS		