

EVALUATION OF BRINJAL VARIETIES FOR YIELD AND RESISTANCE TO BACTERIAL WILT (*RALSTONIA SOLANACEARUM*)

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Abstract: Comparative performance of brinjal varieties and lines over five years revealed the superiority of SM-141 (Haritha) in terms of yield, quality and resistance to bacterial wilt (*Ralstoniasolanacearum*). This culture produces long, light green and glossy cylindrical fruits, with a mean wilt incidence of 9.38 per cent. SM-141 has non-prickly stem and leaves with white flowers and has a mean productivity of 13.5 t ha⁻¹. Considering its performance in the research stations and in farmers' fields, SM-141 has been released as Haritha for the State of Kerala.

Key words: Bacterial wilt, brinjal, eggplant, productivity

INTRODUCTION

Perennial vegetables and semi-perennial varieties of chillies and brinjal are integral components of the homesteads for a continuous supply of vegetables for the family. Heavy incidence of bacterial wilt in the acidic soils of the state warrants the need for wilt resistant varieties with protracted fruiting habit for the homesteads of Kerala. The present paper deals with the comparative performance of the brinjal lines and varieties in terms of yield, quality and bacterial wilt (*Ralstonia solanacearum*) resistance.

MATERIALS AND METHODS

The bacterial wilt resistant culture SM-141 developed in the ICAR Adhoc Scheme on "Breeding for Resistance to Bacterial Wilt in Chilli and Brinjal" was compared with the national varieties / advanced cultures as a part of the All India co-ordinated trials. The experiment was carried out in a wilt-sick soil at Vellanikkara. The plants were also subjected to artificial inoculation as per Winstead and Kelman (1952). Initially, SM-141 was tested with seven entries during 1987-88 and later with eight during 1988-89, 10 during 1989-90 and seven each during 1991-92 and 1993-94. Thirteen varieties / cultures found resistant to bacterial wilt in the parental institutions were selected for comparison (Table 1).

Evaluation was done during kharif season in a randomised block design with three replications as per package of practices recommendations (KAU,1993). There were 30 plants / variety / replication at a spacing of 60x45 cm and the crop was retained for five months for the completion of harvest. Bacterial wilt was confirmed through ooze test and the varieties were scored for resistance / susceptibility to wilt as per Mew and Ho (1976). The performance of SM-141 was further tested in the

farmers' fields in Thrissur, Palakkad, Malappuram and Kottayam districts (18 locations)

Table 1. Resistant varieties / cultures selected for the study

Sl. No.	Name of variety/culture	Source
1	Surya	Kerala Agricultural University, Vellanikkara
2	Swetha	Kerala Agricultural University, Vellanikkara
3	Arka Nidhi	Indian Institute of Horticultural Research, Bangalore
4	Arka Neelkanth	Indian Institute of Horticultural Research, Bangalore
5	Arka Keshav	Indian Institute of Horticultural Research, Bangalore
6	PantRituraj	G.B.Pant University of Agrl Technology, Pantnagar
7	PantSamrat	G.B.Pant University of Agrl. Technology, Pantnagar
8	BB 7	Orissa University of Agrl. Technology, Bhubaneswar
9	BB 11	Orissa University of Agrl. Technology, Bhubaneswar
10	BB 1	Orissa University of Agrl. Technology, Bhubaneswar
11	BB 44	Orissa University of Agrl. Technology, Bhubaneswar
12	BB 13-1	Orissa University of Agrl. Technology, Bhubaneswar
13	Pusa Purple Cluster	Indian Agricultural Research Institute, New Delhi

during kharif, 1996 by comparing with the standard variety, Surya and the local cultivar predominant in each location.

RESULTS AND DISCUSSION

The brinjal culture SM-141 was compared with the national varieties / advanced cultures

Table 2. Bacterial wilt incidence (%) in brinjal varieties from 1987-1994 in the All India Coordinated trials at Vellanikkara

Sl. No	Varieties	Sept 87-Jan 88	Sept 88-Jan 89	Apr 89-Aug 90	Sept 91-Feb 92	Nov 93-Mar 94	Mean
1	Surya (SM 6-7)	2.2	10.36	5.75	-	-	6.10
2	Swetha (SM 6-6)	-	-	0.0	11.76	17.78	9.82
3	SM-141	0.0	13.45	0.0	13.43	20.0	9.38
4	Arka Nidhi (BWR-12)	0.0	5.7	13.48	12.0	21.11	10.46
5	Arka Neelkanth (BWR-54)	0.0	3.33	37.66	-	-	13.67
6	Arka Keshav (BWR-21)	-	-	-	25.71	18.89	22.30
7	BB-7	26.6	46.32	62.92	72.0	95.56	60.69
8	BB-11	32.2	77.93	67.82	-	-	59.32
9	BB-1	31.1	48.36	38.89	-	-	39.44
10	BB-44	-	-	-	5.3	18.27	11.80
11	BB-13-1	-	-	-	-	91.11	91.11
12	Pant Rituraj	0.0	22.46	97.72	-	98.89	54.77
13	Pant Smart	-	-	95.5	97.33	-	96.42
14	Pusa Purple Cluster	-	94.05	13.1	-	-	53.58
15	HOE-44	-	-	-	100.0	-	100

Table 3. Yield (t ha⁻¹) of brinjal varieties from 1987-1994 in the All India coordinated trials at Vellanikkara, Thrissur

Sl. No.	Varieties	Sept 87-Jan 88	Sept 88-Jan 89	Apr 89-Aug 90	Sept 91-Feb 92	Nov 93-Mar 94	Mean
1	Surya	18.94	15.61	20.99	-	-	18.51
2	Swetha	-	-	21.72	10.82	9.10	13.88
3	SM-141	15.84	17.98	7.60	16.58	7.75	13.15
4	Arka Nidhi	15.20	12.82	18.61	10.69	7.48	12.96
5	Arka Neelkanth	8.05	7.65	1.27	-	-	5.66
6	Arka Keshav	-	-	-	5.94	5.70	5.82
7	BB-7	6.40	7.84	6.59	2.15	0.04	4.60
8	BB-11	4.19	0.64	4.26	-	-	3.03
9	BB-1	9.30	7.80	16.82	-	-	11.30
10	BB-44	-	-	0.69	22.35	7.28	14.80
11	BB 13-1	-	-	-	-	0.20	0.20
12	Pant Rituraj	11.51	9.63	4.61	-	0.05	6.45
13	Pant Samrat	-	-	0.69	-	-	0.69
14	Pusa Purple Cluster	-	0.0	21.17	-	-	10.59
15	HOE-44	-	-	-	0.0	-	0.0
	CD (0.05)	0.39	0.41	0.75	0.58	0.10	

for five seasons during 1987-94. During 1987-88, SM-141 was completely free from bacterial wilt when tested in the wilt sick soil (Table 1). In the subsequent years certain amount of wilting was noticed and wilt incidence was 13.45%, 13.43% and 20.0% respectively during 1988-89, 91-92 and 93-94 with a mean wilting of 9.38% over five years.

However, varieties with less than 20% can be rated as resistant in the bacterial wilt screening programmes (Mew and Ho, 1976). The wilt incidence in the Bhubaneswar varieties (11.8 - 91.11%) and Bangalore varieties (10.46 - 22.30%) was much higher than KAU varieties Surya, Swetha and SM-141 (6.10 - 9.82%).

Table 4. Performance of brinjal varieties in the farm trial

No.	Location of farm trial	SM-141		Surya		Local	
		Yield (t ha ⁻¹)	Wilt (%)	Yield (t ha ⁻¹)	Wilt (%)	Yield (t ha ⁻¹)	Wilt (%)
1	Chazhur - Trichur	20.0	0.0	-	-	4.3	75.0
2	Nadathara	13.0	0.0	10.0	0.0	-	-
3	Ollukkara	45.0	0.0	30.0	-	26.5	12.50
4	Pananchery	60.0	0.0	35.0	2.5	30.0	15.0
5	Puthur	25.0	0.0	12.5	0.0	10.0	40.0
6	Vilvatam	50.0	0.0	-	-	30.0	40.0
7	Alalhoor - Palakkad	32.0	0.0	15.25	0.0	18.125	13.0
8	Kavassery	33.88	2.6	18.03	5.2	12.0	44.74
9	Kottai	22.0	0.0	22.5	0.0	9.0	50.0
10	Kuthannoor	15.0	0.0	-	-	10.0	0.0
11	Nenmara	60.0	0.0	-	-	21.0	30.0
12	Thrithala	20.0	0.0	15.0	0.0	11.25	40.0
13	Paipra - Ernakulam	100.0	0.0	-	-	60.0	35.0
14	Malayattoor/Neeleswaram	21.25	2.5	-	-	11.25	40.0
15	Thirumaradi	25.0	0.0	20.0	10.0	18.0	30.0
16	Koothattukulam	28.0	0.0	20.0	0.0	17.0	30.0
17	Manjapra	30.0	0.0	-	-	17.5	32.0
18	Kottayam	30.0	0.0	-	-	20.0	60.0
	Mean	35.0	0.28	19.82	1.77	19.78	34.54
	CD (0.05)	5.32					

The susceptibility of the reported wilt resistant varieties from Bhubaneswar and Bangalore during the present study at Vellanikkara reveals the most virulent nature of Vellanikkara strain of *Ralstonia solanacearum*.

Productivity was maximum in Surya (18.94 t h⁻¹) followed by SM-141 (15.84 t h⁻¹) during 1987-88 (Table 2). SM-141 ranked first in yield during 1988-89 (17.98 t h⁻¹). However, during 1989-90, the performance of SM-141 was not encouraging due to heavy jassid infestation. During the next two years, SM 141 ranked second with a mean productivity of 13.15 t h⁻¹ over five years. Under the mild subtropical climatic condition of Wayanad also SM-141 had high productivity and was totally free from bacterial wilt.

SM-141 out-yielded the standard variety Surya and the local check in all the farm trials in the central part of Kerala (Table 3). SM-141 had a mean yield of 35 t h⁻¹ compared to 19.82 t in Surya and 19.78 t in local. In Paipra, which is a traditional belt for growing brinjal, SM-141 yielded as high as 100 t h⁻¹. In all the locations studied, except two, it was

totally free from bacterial wilt compared to 34.54% in the local check. The large cylindrically shaped light green glossy fruit of Haritha was much appreciated by the growers as well as consumers in the central Kerala.

Considering the superiority in bacterial wilt resistance, productivity and desirable plant and fruit characters, SM-141 has been recommended by 9th ZREAC meeting (Central Zone) and has been released as "Haritha" by the 19th State Seed Subcommittee for Crop Standards held at Thiruvananthapuram on 16th May 1997.

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