



# PERFORMANCE OF DIFFERENT VARIETIES OF BRINJAL (*SOLANUM MELONGENA* L.) UNDER NORTH KONKAN CONDITIONS OF MAHARASHTRA, INDIA

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## Abstract

A field trial was conducted at Agril. Research Station, Palghar, Dist. Thane (Maharashtra), India; during *rabi* season of 2007-08 at two farms to evaluate the performance of eight varieties of brinjal having purple colour fruits *viz*; CHES-309 (C), Arka Nilkanth, Bandhtivare, Manjari gota, Manju, Lanja local, PLG Local and Arka Nidhi. The experiment was conducted in RBD. There were significant differences in growth, yield parameters and infestation of shoot and fruit borer and bacterial wilt. The significantly highest plant height was recorded in Arka Nidhi (87.77 cm), which was at par with the varieties Manju, CHES-309. The growth performance at two locations also varied. The size of fruit was also significantly varied. The maximum fruit length (16.62 cm) was recorded in variety Bandhtivare while maximum fruit circumference (20.70 cm) was recorded in Manjari gota variety. The maximum fruit weight (94.34 g) was found in variety Bandhtivare and the minimum fruit weight (57.34 g) was in Arka Nidhi. The highest yield (199.10 q/ha) was recorded in the variety CHES-309 followed by Arka Nilkanth (168.79 q/ha) and the lowest yield (22.72 q/ha) was in variety Manjari gota due to lowest plant population because of incidence of bacterial wilt disease. The maximum shoot and fruit borer infestation (19.46%) was noticed in variety Manjari gota which ultimately gave less marketable fruits. The variety Arka Nilkanth and Arka Nidhi showed significantly less fruit infestation (6.78 and 6.79%, respectively). The incidence of bacterial wilt in different varieties ranged from 1.53 to 68.67 per cent. The incidence of bacterial wilt was maximum (66.50 per cent) in variety Manjari gota, which adversely affected the yield potential of variety.

**Key words :** Brinjal, shoot and fruit borer, bacterial wilt.

## Introduction

In India, brinjal (*Solanum melongena* L.) is a widespread vegetable. It is popular, high productive and principal vegetable crop and known as poor man's crop. It occupies about 8.45 per cent of the total area under vegetables in India (Patnaik *et al.*, 2004). The area under brinjal cultivation in India was 5.90 lakh hectares with production of 101.64 MT while in Maharashtra the area under brinjal cultivation was 0.30 lakh hectares with production of 4.95 lakh MT (Anonymous, 2010). It belongs to family solanaceae and is rich in diversity, both improved and local. There is high degree of variation in growth, yield, fruit type, and reaction to pest and diseases. It is commercially grown in Thane district of Maharashtra as it is most suitable for transportation to market. There is a great demand for purple coloured fruits in the nearby areas.

The brinjal shoot and fruit borer (*Leucinodes orbonalis*) is major pest and the bacterial wilt is a major disease of brinjal. Brinjal shoot and fruit borer is the most destructive insect of brinjal and in India which causes 37 – 63 per cent fruit damage (Dhankar, 1988). The infestation reduced the marketable yield of fruit. However, the bacterial wilt disease in brinjal and tomato vegetable is dominant in this region, which adversely affect the yield potential of the crop. Keeping in view, field experiment was conducted to evaluate the different types of brinjal having purple colour fruits against incidence of brinjal shoot and fruit borer pest and bacterial wilt disease under north konkan agroclimatic conditions of Maharashtra.

## Materials and Methods

A field experiment was carried out at Agril. Research Station, Palghar, Dist. Thane, Maharashtra State (India) during *rabi* season of 2007-08 on two locations *viz*; Vegetable Improvement Scheme farm and NARP farm. The soil properties of these locations are given in table 1.

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**Table 1** : Physico-chemical properties of experimental sites.

S. no.	Properties	Vegetable improvement scheme farm	NARP Farm
1.	pH	8.6	6.1
2.	EC (ds/m)	0.36	0.14
3.	Organic Carbon (%)	0.99	1.00
4.	Available Nitrogen (N) kg ha <sup>-1</sup>	148.96	164.64
5.	Available phosphorus (P <sub>2</sub> O <sub>5</sub> ) kg ha <sup>-1</sup>	2.04	3.29
6.	Available potassium (K <sub>2</sub> O) kg ha <sup>-1</sup>	176.17	189.73
7.	Calcium carbonate	3 to 7 %	3 to 7%

The treatments consisted of eight varieties of brinjal having purple colour fruits *viz*; CHES-309(C), Arka Nilkanth, Bandhtivare, Manjari gota, Manju, Lanja local, Palghar Local and Arka Nidhi, which were grown by adopting Randomized Block Design with three replications. Recommended tillage operations were carried out and 45 days old seedlings were transplanted at a spacing of 75 cm × 60 cm. All the experimental plots received FYM @ 25 t/ha and NPK fertilizers @ 150 : 50 : 50 kg/ha. Full dose of FYM, P, K and 1/3<sup>rd</sup> dose of N was given at the time of transplanting of seedlings and remaining N was given in two equal doses at three weeks interval. The recommended cultural practices like irrigation, weed control, etc. were adopted equally to all the varieties. Observations on growth and fruiting parameters, incidence of brinjal shoot and fruit borer and bacterial wilt were recorded. Data were analyzed statistically (Panse and Sukhatme, 1985).

## Results and Discussion

It is evident from the results presented in table 2 that there were significant variations among tested brinjal varieties for growth, yield parameters at both locations. Among the varieties, significantly highest plant height was recorded in Arka Nidhi (87.77 cm) which was at par with the varieties Manju, CHES-309. The growth performance at two locations also varied. The size of fruit was also significantly varied. The maximum fruit length (16.62 cm) was recorded in variety Bandhtivare while maximum fruit circumference (20.70 cm) was recorded in Manjari gota variety. The maximum fruit weight (94.34 g) was found in variety Bandhtivare and the minimum fruit weight (57.34 g) was in Arka Nidhi. The fruit weight was at par in the varieties CHES-309, Manjari gota and Manju. The distinction growth, fruit size

**Table 2** : Growth performance of brinjal varieties under north Konkan conditions

S. no.	Varieties	Plant height (cm)			Fruit length (cm)			Fruit Circumference (cm)			Fruits weight (g)		
		VIS Farm	NARP Farm	Mean	VIS Farm	NARP Farm	Mean	VIS Farm	NARP Farm	Mean	VIS Farm	NARP Farm	Mean
V <sub>1</sub>	CHES-309(C)	83.57	85.00	84.29	12.87	12.57	12.72	13.251	12.80	13.03	86.50	86.90	86.70
V <sub>2</sub>	Arka Nilkanth	74.57	80.33	77.45	13.70	13.17	13.44	10.613	11.17	10.89	71.40	80.33	75.87
V <sub>3</sub>	Bandhtivare	68.07	75.00	71.54	16.73	16.50	16.62	18.181	19.60	18.89	92.67	96.00	94.34
V <sub>4</sub>	Manjari gota	51.27	58.00	54.64	11.17	12.23	11.70	20.222	21.17	20.70	84.67	84.57	84.62
V <sub>5</sub>	Manju	79.33	90.00	84.67	8.07	7.77	7.92	15.072	14.97	15.02	84.83	83.67	84.25
V <sub>6</sub>	Lanja local	78.13	76.67	77.40	6.90	6.37	6.64	13.094	13.50	13.30	63.00	65.67	64.34
V <sub>7</sub>	PLG Local	84.27	76.67	80.47	13.60	14.10	13.85	13.157	14.43	13.79	77.83	78.00	77.92
V <sub>8</sub>	Arka Nidhi	84.87	90.67	87.77	14.57	16.07	15.32	11.398	11.63	11.51	54.00	60.67	57.34
	SE±	3.5	4.05	2.90	0.38	0.29	3.38	0.91	0.73	0.32	1.61	2.54	1.79
	C.D. at 5%	10.7	12.28	8.88	1.16	0.88	1.18	2.73	2.22	1.00	4.88	7.72	5.42

**Table 3 :** Reaction of brinjal varieties to shoot and fruit borer and bacterial wilt infestation.

S. no.	Varieties	Fruit infestation by shoot and fruit borer (%)	Bacterial wilt (%)
V <sub>1</sub>	CHES-309 (C)	12.00 (18.83)*	11.57 (19.73)
V <sub>2</sub>	Arka Nilkanth	6.78 (11.00)	1.63 (7.04)
V <sub>3</sub>	Bandhtivare	13.05 (18.58)	21.80 (27.83)
V <sub>4</sub>	Manjari gota	19.46 (24.74)	66.50 (55.98)
V <sub>5</sub>	Manju	17.39 (24.29)	22.73 (28.59)
V <sub>6</sub>	Lanja local	12.01 (17.16)	18.49 (25.62)
V <sub>7</sub>	PLG Local	14.15 (21.92)	20.57 (26.21)
V <sub>8</sub>	Arka Nidhi	6.79 (12.96)	1.79 (7.71)
	SE ±	1.53	1.55
	C.D. at 5%	4.64	4.71

\* - Figures in the parenthesis indicates the corresponding arc sine transformed values.

**Table 4 :** Yield performance of brinjal varieties under north Konkan conditions.

S. no.	Varieties	Fruit yield (Kg/plant)			Fruit yield (q/ha)			Fruit colour
		VIS Farm	NARPFarm	Mean	VIS Farm	NARPFarm	Mean	
V <sub>1</sub>	CHES-309 (C)	0.85	0.94	0.90	188.52	209.67	199.10	Purple white
V <sub>2</sub>	Arka Nilkanth	0.70	0.82	0.76	154.91	182.67	168.79	Purple
V <sub>3</sub>	Bandhtivare	0.48	0.57	0.53	100.80	127.67	114.24	Purple
V <sub>4</sub>	Manjari gota	0.09	0.11	0.10	19.93	25.50	22.72	Purple
V <sub>5</sub>	Manju	0.57	0.59	0.58	121.17	131.37	126.27	Purple
V <sub>6</sub>	Lanja local	0.45	0.53	0.49	97.10	118.53	107.82	Purple
V <sub>7</sub>	PLG Local	0.47	0.56	0.52	105.50	125.33	115.42	Purple
V <sub>8</sub>	Arka Nidhi	0.55	0.66	0.61	122.67	147.50	135.09	Purple
	SE ±	0.01	0.02	0.02	17.9	4.17	3.96	-
	C.D. at 5%	0.03	0.06	0.06	54.5	12.64	11.99	-

and fruit weight might be due to genetic and environmental conditions.

The reaction of these brinjal varieties to shoot and fruit borer and bacterial wilt infestation was presented in table 3. The maximum shoot and fruit borer infestation (19.46%) was noticed in variety Manjari gota, which ultimately gave less marketable fruits. The variety Arka Nilkanth and Arka Nidhi showed significantly less fruit infestation (6.78 and 6.79 per cent, respectively). As the bacterial wilt incidence concerned, the less susceptibility was reported in varieties Arka Nilkanth and Arka Nidhi. The incidence of bacterial blight was maximum (66.50 per cent) in variety Manjari gota, which adversely affected the yield potential of variety. The incidence of bacterial wilt in different varieties ranged from 1.63 to 66.50 per cent. The minimum incidence (1.63 per cent) was found in variety Arka Nilkanth followed by Arka Nidhi (1.79 per cent) variety. Arka Nilkanth and Arka Nidhi varieties

were found tolerant to pest and disease incidence. Similar findings were also reported by Thapa *et al.* (2005).

The yield of different brinjal varieties are given in table 4. The highest yield (199.10 q/ha.) was recorded in the variety CHES-309 followed by Arka Nilkanth (168.79 q/ha.) and the lowest yield (22.72 q/ha.) was in variety Manjari gota due to lowest plant population because of incidence of bacterial wilt disease. The variation might be due to the genetic and environmental effects. Similar results were also obtained by Som and Maity (1986) and Yadav (1996) in brinjal.

Thus, it can be concluded that under North Konkan conditions, the varieties Arka Nilkanth, Arka Nidhi and CHES-309 may be recommended for optimum yield and profit due to their high yield potential, market acceptance and tolerance to brinjal shoot and fruit borer pest and bacterial wilt disease.

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