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## Gujarat round Brinjal-7 (GRB-7): A new high yielding round variety developed by JAU, Junagadh to boost-up Brinjal production in Gujarat State

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### Abstract

A Brinjal variety GRB-7 (JBR-14-07) was developed at Vegetable Research Station, Junagadh Agricultural University, Junagadh and was evaluated under state and coordinated trials during 2014-15 to 2018-19, during late *kharif* season at various locations along with check varieties; GJB-3, GRB-5, GNRB-1 and Swarna Mani Black. On the basis of mean fruit yield data from the State trials GRB-7 recorded highest fruit yield of 405.30 q/ha as compared to check varieties; GJB-3, GRB-5, GNRB-1 and Swarna Mani Black., which was 24.07% higher than check variety GJB-3 (326.66 q/ha) under 14 testing trials, while in 13 testing trials, the mean fruit yield of GRB-7 variety was 368.71 q/ha, which was 28.66% higher than national check Swarna Mani Black (286.57 q/ha), whereas, in 5 testing trials this variety has recorded 388.29 q/ha fruit yield, which was 30.61% and 28.68% higher than check varieties GRB-5 (297.30 q/ha) and GNRB-1 (301.74 q/ha) The fruits of this variety are medium in size with medium round in shape, attractive pink purple in colour and good shining and pulp is white with less seeds.). Fruit contained 1.09% protein, 3.17% total sugars, 0.17% acidity and total 69.00 mg/100 g phenols which were more as compared to check varieties while polyphenol oxidase was lesser (1.57 od/min/g).

**Keywords:** Yield, performance, cluster, Brinjal variety, Gujarat, GRB-7

### Introduction

Brinjal (*Solanum mlongena* L.) is one of the most common tropical vegetables grown in India. A large number of cultivars differing in size, shape and colour of fruits are grown in India. Consequently, it is also referred to as the common man's vegetable in the Indian subcontinent owing to its year-around availability (Saini *et al.* 2019) [4]. Brinjal is considered a native to India where the major domestication of cultivars occurred. Among Brinjal producers, China, India, Japan and Turkey are the four major countries. China is the world's top eggplant grower, accounting for more than half of world acreage and India stands second, with about one quarter of the world total production.). It is widely cultivated as one of the most important vegetable crop grown extensively throughout the tropical and sub-tropical regions of world. For the development of new variety in Brinjal, the attempts were made to collect and improve the local cultivars grown in Gujarat state. Kashi Vishesh, Kashi Amrit, Kashi Anupam and Kashi Hemant were developed at IIVR – Varanasi and are becoming popular at farmers field Anon (2005) [1]. Therefore the present paper reports about one such varietal development. Hence, an experiment conducted to study the effects of various breeding aspect alone vegetative growth, yield, quality, fruit borer incidence and economics in Brinjal.

### Breeding Objectives

To develop high yielding and better quality Brinjal variety with pink purple in colour, medium in size with medium round in shape and cluster fruit bearing habit

### Material and Methods

Brinjal variety GRB-7 was developed by hybridization between JBR-02-11 x GOB-1 followed by pedigree method of selection. This genotype is developed from the cross JBR-02-11 x GOB-1 during 2007-08 and pedigree method of selection was adopted during 2009-10 to 2013-14. This genotype JBR-14-07 was tested in PET I during 2014-15 and onwards at multi-location trials in LSVT in the State from the year 2015-16 to 2018-19.

This genotype was also contributed in AICRP (VC) since 2017-18 to 2019-20 for national testing.

### Result and Discussion

A Brinjal variety GRB-7 was evaluated at Junagadh, Anand, Jagudan, Navsari and Waghai centers during late kharif/rabi from 2014-15 to 2018-19, at different state level varietal testing trials along with the check varieties; GJB-3, GRB-5, GNRB-1 and Swarna Mani Black. GRB-7 variety has recorded mean fruit yield of 405.30 q/ha, which was 24.07% higher than check variety GJB-3 (326.66 q/ha) under 14 testing trials, while in 13 testing trials, the mean fruit yield of GRB-7 variety was 368.71 q/ha, which was 28.66% higher than national check Swarna Mani Black (286.57 q/ha), whereas, in 5 testing trials this variety has recorded 388.29 q/ha fruit yield, which was 30.61% and 28.68% higher than check varieties GRB-5 (297.30 q/ha) and GNRB-1 (301.74 q/ha), respectively (Table-1). Hisar Shymal, Hisar Pragati, Pusa Anmol and Pusa Uttam are the important varieties of Brinjal (Baswana and Dharmveer Duhan, 2002) [2]. The fruits of this variety were medium in size with medium round in shape, attractive pink purple in colour and good shining. Average fruit length, girth and weight of this variety was 7.85 cm, 15.16 cm and 64.48 gm respectively (Table 2). The qualitative parameters of GRB-7 were comparatively higher than GJB-3, GRB-5, GNRB-1 and Swarna Mani Black. These results are in agreement with the findings of Rathod *et al.* (2017 & 2021) [5, 6]. Fruit contained 1.09% protein, 3.17%

total sugars, 0.17% acidity and total 69.00 mg/100 g phenols which were more as compared to check varieties while polyphenol oxidase was lesser (1.57 od/min/g). Rathod *et al.* (2017 & 2021) [5, 6].

In Junagadh center, Whitefly, jassids and Shoot & fruit borer population range was also less (0.00-3.50 per leaf), (2.65-4.45 per leaf) and (2.40-3.49%) in GRB-7 respectively as compared to check varieties GJB-3 (0.00-4.82 per leaf) (3.78-6.10 per leaf) and (3.20-4.58% per leaf), GRB-5 (0.00-5.60 per leaf), (4.60-5.67) and (5.54-6.78%), GNRB-1(0.00-3.15 per leaf), (2.80-4.10 per leaf) and (2.57-3.51%) and Swarna Mani Black(0.00-5.10 per leaf), (4.48-5.08 per leaf) and (4.73-5.88%) respectively (Table-4). Rathod *et al.* (2017 & 2021) [5, 6].

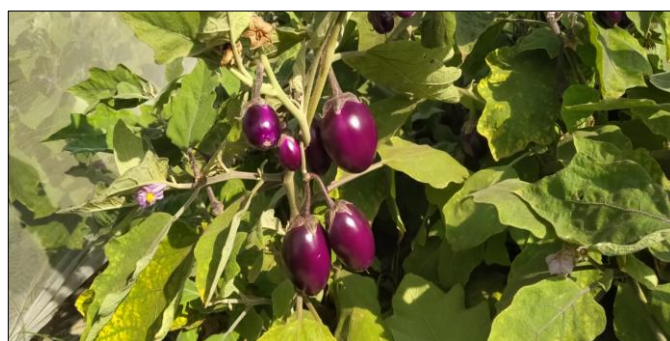


Fig 1: GRB-7 (JBR-14-07)

Table 1: Year and Center wise yield performance of Brinjal variety GRB-7 in comparison with check varieties in multi- locations

Year	Name of Trial	Location	Fruit yield (q/ha)					S.Em. +	C. D. at 5%	C. V.%
			GRB-7 (JBR-14-07)	GJB-3 (a)	S. Mani Black (b)	GRB-5 (c)	GNRB-1 (d)			
2014-15	PET	Junagadh	439.98 <sup>a</sup>	277.78	-	-	-	28.75	85.43	15.80
	Mean (1)		439.98	277.78	-	-	-	-	-	-
	% increase over		-	58.39	-	-	-	-	-	-
2015-16	LSVT	Anand	948.04	929.65	-	-	-	33.77	97.05	6.82
		Junagadh	343.75	307.61	-	-	-	23.30	67.04	12.73
		Navsari	340.50 <sup>a</sup>	243.00	-	-	-	18.20	52.50	10.81
		Jagudan#	91.77	152.88	-	-	-	18.35	52.78	15.62
	Mean (3)		544.10	493.42	-	-	-	-	-	-
	% increase over		-	10.27	-	-	-	-	-	-
2016-17	LSVT	Anand	459.10	491.77	499.53	-	-	29.38	85.75	10.07
		Junagadh	346.06 <sup>ab</sup>	267.49	240.23	-	-	16.42	48.16	9.67
		Navsari	349.50 <sup>ab</sup>	218.10	184.70	-	-	21.12	61.97	12.72
		Jagudan	287.44 <sup>b</sup>	257.21	252.45	-	-	11.54	33.86	7.19
		Waghai	347.22 <sup>ab</sup>	264.92	257.20	-	-	16.35	48.21	10.45
	Mean (5)		357.86	299.90	286.82	-	-	-	-	-
	% increase over		-	19.33	24.77	-	-	-	-	-
2017-18	LSVT	Anand	399.69 <sup>a</sup>	323.05	344.91	-	-	25.67	74.96	10.59
		Junagadh	353.40	345.94	325.61	-	-	25.46	74.69	13.52
		Navsari	331.30 <sup>ab</sup>	230.10	229.60	-	-	15.4	45.30	9.53
		Jagudan	391.26 <sup>ab</sup>	143.96	253.08	-	-	38.76	113.68	26.4
		Waghai	336.93 <sup>ab</sup>	272.64	254.63	-	-	14.82	43.47	9.60
	Mean (5)		362.52	263.14	281.57	-	-	-	-	-
	% increase over		-	37.77	28.75	-	-	-	-	-
2018-19	LSVT	Anand	412.55 <sup>bcd</sup>	-	325.87	299.90	329.22	25.00	72.70	10.22
		Junagadh	434.10 <sup>bcd</sup>	-	302.75	325.77	308.26	24.52	71.30	10.91
		Navsari	344.68 <sup>b</sup>	-	254.80	304.27	311.54	14.63	42.55	8.50
		Jagudan	402.73 <sup>cd</sup>	-	-	233.28	259.26	21.57	62.95	10.78
		Waghai	347.40 <sup>d</sup>	-	-	323.38	300.44	15.84	46.25	9.18
	Mean (5)		388.29	-	-	297.30	301.74	-	-	-
	% increase over		-	-	-	30.61	28.68	-	-	-
	Overall Mean (14)		405.30	326.66	-	-	-	-	-	-
	% increase over		-	24.07	-	-	-	-	-	-

Overall Mean (13)	368.71	-	286.57	-	-	-	-	-
% increase over	-	-	28.66	-	-	-	-	-
Overall Mean (5)	388.29	-	-	297.30	301.74	-	-	-
% increase over	-	-	-	30.61	28.68	-	-	-
No. of frequency in top non-significant group	15/19	2/14	1/13	2/5	1/5			

\* Significant at 5% level than checks a=GAOB-2 and b=GJB-3

# Data were not included due to below state average

**Table 2:** Mean and range of ancillary observations recorded from 2014-15 to 2018-19 at Junagadh center

S. N.	Ancillary observations	GRB-7 (JBR-14-07)	GJB-3 (SC)	GRB-5 (SC)	GNRB-1 (SC)	S. Mani Black (NC)
1	Plant height (cm)	60.64 (47.78-79.44)	51.22 (41.11-62.67)	67.30 (57.22-83.33)	53.12 (35.00-74.70)	65.43 (62.78-70.19)
2	Plant spread (cm)	61.85 (60.00-63.33)	66.11 (65.00-67.22)	65.10 (62.78-65.00)	63.80 (61.11-65.28)	73.50 (69.31-76.66)
3	No. of branches/plant	3.79 (3.00-4.66)	3.81 (3.00-4.56)	3.50 (3.11-4.11)	3.78 (2.88-4.67)	3.96 (3.33-4.67)
4	Fruit length (cm)	7.85 (5.36-12.27)	11.05 (10.72-14.17)	7.82 (7.83-8.61)	14.67 (12.78-16.31)	8.68 (8.19-9.02)
5	Fruit girth (cm)	15.16 (13.39-17.83)	20.17 (16.59-24.39)	13.68 (11.16-15.00)	13.61 (12.82-14.91)	12.51 (11.17-13.50)
6	Fruit weight (g)	64.48 (53.40-87.00)	136.03 (127.50-146.00)	75.18 (58.33-89.40)	82.38 (59.60-105.70)	81.75 (77.93-85.00)
7	No. of fruits/plant	47 (22-74)	22 (10-32)	25 (21-29)	24 (13-32)	18 (12-30)
8	Days to 1 <sup>st</sup> picking after Transfer of planting	69 (57-78)	68 (57-81)	69 (64-74)	69 (57-79)	72 (64-77)
9	Days to last picking after Transfer of planting	169 (159-172)	167 (160-169)	172 (163-183)	166 (158-183)	169 (167-171)
10	No. of pickings	16 (12-18)	15 (12-17)	17 (14-18)	16 (12-19)	15 (12-18)
11	Fruit yield (q/ha)	405.30	326.66	297.30	301.74	286.57

**Table 3:** Quality parameters

Sr. No.	Quality Parameters	GRB-7 (JBR-14-07)	GJB-3 (SC)	GRB-5 (SC)	GNRB-1 (SC)
1	Moisture (%)	92.03	92.52	91.82	92.18
2	Colour of peel (od/g)	2.93	2.67	2.87	2.98
3	Poly Phenol Oxidase (od/min/g)	1.57	1.31	1.45	1.61
4	Glycoalkaloid (od/g)	0.38	0.30	0.44	0.32
5	TSS (°Brix)	8.00	8.00	7.00	7.00
6	Protein (%)	1.09	0.73	0.64	0.80
7	Acidity (%)	0.17	0.11	0.15	0.15
8	Total phenol (mg/100g)	69.00	41.00	48.00	53.00
9	Total soluble sugar (%)	3.17	3.51	3.77	3.60

**Table 4:** Reaction to major pests recorded from 2014-15 to 2018-19 at Junagadh center

Name of Pest	Year	GRB-7 (JBR-14-07)	GJB-3 (SC)	GRB-5 (SC)	GNRB-1 (SC)	S. Mani Black (NC)
No. of Jassids/leaf (Junagadh)	2015-16	2.65	3.78	4.60	2.80	-
	2016-17	3.90	5.24	5.67	3.80	4.67
	2017-18	4.45	6.10	-	4.10	5.08
	2018-19	3.12	-	5.58	2.90	4.48
	Range	2.65-4.45	3.78-6.10	4.60-5.67	2.80-4.10	4.48-5.08
No. of whitefly/leaf (Junagadh)	2015-16	2.08	3.78	4.28	2.18	-
	2016-17	3.18	4.82	5.60	3.00	4.70
	2017-18	3.50	4.25	-	3.15	5.10
	2018-19	0.00	0.00	0.00	0.00	0.00
	Range	0.00-3.50	0.00-4.82	0.00-5.60	0.00-3.15	0.00-5.10
Shoot & fruit borer damage (%) (Junagadh)	2015-16	2.40	3.20	5.54	2.70	-
	2016-17	3.30	3.92	6.78	3.40	4.73
	2017-18	3.49	4.58	-	3.51	5.88
	2018-19	2.58	-	6.62	2.57	5.69
	Range	2.40-3.49	3.20-4.58	5.54-6.78	2.57-3.51	4.73-5.88

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