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Gujarat Round Brinjal (GRB-5) – A new high yielding round brinjal variety

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Abstract

A Brinjal variety GRB-5 (JB-12-06) was developed at Vegetable Research Station, Junagadh Agricultural University, Junagadh and was evaluated under state and coordinated trials during 2012-13 to 2016-17 and 2015-16 to 2017-18, respectively, during late *kharif* season at various locations along with check varieties; GAOB-2 and GJB-3. On the basis of mean fruit yield data from the State trials GRB-5 recorded highest fruit yield of 395.04 q/ha as compared to check varieties; GAOB-2 (358.74 q/ha) and GJB-3 (317.60 q/ha), which was 10.12% and 24.38% higher over both the state check varieties, respectively. The fruits of this variety are medium in size with medium round in shape, attractive green in colour with purple shadow strip and good shining and pulp is white with less seeds. The protein (0.89 %), total soluble sugar (4.12 %), total soluble solids (9.00% Brix) and total phenol (28.12 mg/100g) are more to check varieties GAOB-2 and GJB-3. Incidence jassids (1.81/leaf), whitefly (1.33/leaf) and % fruit borer damage (0.68 %), the proposed entry was found superior than check varieties GAOB-2 and GJB-3.

Keywords: Yield, performance, brinjal variety, Gujarat, GRB-5

Introduction

Eggplant, popularly known as brinjal or aubergine (*Solanum melongena* L.) is among the extensively cultivated vegetables. 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]. 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 green colour and medium to big in size.

Material and Methods

Brinjal variety GRB-5 was developed by hybridization between JBR-03-16 x JBGR-06-07 followed by pedigree method of selection. This genotype was tested as an entry in Preliminary Evaluation Trial (PET) during 2012-13 and promoted to Large Scale Varietal Trial (LSVT) and tested at multi location *viz.* Junagadh, Anand, Ladol, Jagudan and Navsari centers in Gujarat State. Because of its good performance in state trials, the entry GRG-5 was tested under All India Coordinated vegetable Research Project – from 2012-13 to 2017-18 at different locations in India.

Result and Discussion

The results on fruit yield of GRB-5 along with State check varieties GAOB-2 and GJB-3 in state trials are presented in Table 1. On the basis of fruit yield data from the state level trials at Junagadh, Anand, Ladol and Navsari centers, GRB-5 had proven its superiority by giving higher fruit yield at all the centers. The mean fruit yield of GRB-5 was 395.04 q/ha as compared to state check varieties; GAOB-2 (358.74 q/ha) and GJB-3 (317.60 q/ha) in state trials (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 green in colour with purple shadow strip and good shining. Average fruit length, girth and weight of this variety was 10.13 cm, 17.95 cm. and 87.68 gm respectively (Table 2). The qualitative parameters of GRB-5 were comparatively higher than GAOB-2 and GJB-3. The fruits of this variety had higher total sugar (4.12%) and protein (0.89%) compared to 4.03 and 3.48% and 0.79 and 0.75% GAOB-2 and GJB-3 respectively (Table 3), however, poly phenol-oxidase of GRB-5(1.40 od/min/g) was lower than check varieties GAOB-2 (1.34 od/min/g) and GJB-3 (1.27 od/min/g). These results are in agreement with the findings of Rathod *et al.* (2017) [5]. This variety showed lower incidence of little leaf (2.33%), Jassids (1.81 per leaf), white fly (1.33 per leaf) and fruit borer (0.68%) as compared to check varieties GAOB-2 and GJB-3 in which the corresponding values were 5.02, 2.58, 3.22 and 3.28 and 4.49,

2.74, 3.30 and 4.81, respectively (Table 4). The results are supported by the work Rathod *et al.* (2017) [5].



Table 1: Year and Center wise yield performance of brinjal variety GBR-5 in comparison with check varieties in Gujarat state

Year	Name of Trial	Location	Fruit yield of GBR-5 (q/ha)	Fruit yield of check varieties (q/ha)		S.Em+	C.D. at 5%	C.V.%
				GAOB-2(SC) (a)	GJB-3(SC) (b)			
2012-13	PET	Junagadh	326.88	-	358.48	21.93	65.77	12.95
	Mean		326.88	-	358.48	-	-	-
	% increased over			-	-	-	-	-
2013-14	LSVT	Anand	622.81 ^b	610.72	391.20	45.02	130.01	15.93
		Junagadh	407.20 ^{ab}	317.18	287.19	19.98	57.70	10.29
		Navsari	300.00	286.50	301.40	20.60	61.30	10.86
		Waghai #	180.04	177.47	164.61	8.97	25.79	10.15
		Jagudan	263.25	238.79	211.23	19.37	55.70	12.89
	Mean(4)		398.22	363.30	297.76	-	-	-
% increase over			9.64	33.77	-	-	-	
2014-15	LSVT	Anand	331.17	376.98	286.52	28.73	82.74	15.92
		Junagadh	444.10	382.37	367.04	36.09	103.83	15.95
		Navsari	328.00 ^{ab}	250.00	220.00	20.80	59.70	13.88
		Waghai	Trial was vitiated due to heavy rain					
		Jagudan	213.99 ^b	277.26	117.03	15.66	45.14	13.85
	Mean(4)		329.32	321.65	247.65	-	-	-
% increase over			2.38	32.98	-	-	-	
2015-16	LSVT	Anand	954.60	937.75	929.65	33.77	97.05	6.82
		Junagadh	330.45	283.18	307.61	23.30	67.04	12.73
		Navsari	304.30 ^b	269.60	243.00	18.20	52.50	10.81
		Waghai	298.35	272.63	277.78	15.47	44.50	8.72
		Jagudan#	167.10	233.51	152.88	18.35	52.78	15.62
	Mean(4)		471.93	440.79	439.51	-	-	-
% increase over			7.06	7.38	-	-	-	
2016-17	LSVT	Anand	593.10 ^{bc}	544.62	491.77	29.38	85.75	10.07
		Junagadh	312.24 ^{ac}	242.28	267.49	16.42	48.16	9.67
		Navsari	383.80 ^{abc}	246.50	218.10	21.12	61.97	12.72
		Waghai	316.36 ^{bc}	282.92	264.92	16.34	48.21	10.45
		Jagudan	311.91 ^{bc}	279.23	257.21	11.54	33.86	7.19
	Mean(5)		383.48	319.11	299.90	-	-	-
% increase over			20.17	27.87	-	-	-	
Overall Mean(18)			391.25	-	319.87	-	-	-
% increase over				-	22.32	-	-	-
Overall Mean(17)			395.04	358.74	317.60	-	-	-
% increase over				10.12	24.38	-	-	-
No. of frequency in top non-significant group			13/18	6/17	3/18	-	-	-

*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 2012-13 to 2016-17 at Junagadh center

Sr. No.	Ancillary observations	GRB-5	GAOB-2(SC)	GJB-3(SC)
1	Plant height (cm)	70.33(52.77-98.89)	59.86(41.11-75.55)	48.22(37.22-61.67)
2	Plant spread (cm)	80.88(57.78-110.55)	83.19(72.78-109.44)	74.44(56.67-93.88)
3	No. of branches/plant	3.40(2.89-4.11)	3.86(2.77-4.89)	3.62(2.33-4.77)
4	Fruit length (cm)	10.13(7.83-14.11)	11.27(9.27-13.33)	12.30(10.72-14.44)
5	Fruit girth (cm)	17.95(13.72-25.00)	20.22(16.55-24.84)	21.57(17.22-24.78)
6	Fruit weight (g)	87.68(67.0-103.3)	102.40(78.3-128.3)	131.37(106.7-155.7)
7	No. of fruits/plant	32(22-35)	19(17-22)	16(10-22)
8	Days to first picking after T. P.	64(43-77)	61(55-66)	60(41-80)
9	Days to last picking after T. P.	163(148-183)	167(156-183)	164(152-186)
10	No. of pickings	15(13-17)	13(12-14)	14(12-16)
11	Fruit yield (q/ha)	382.37	351.78	311.17

Table 3: Quality Parameters

Sr. No.	Quality Parameters	GRB-5	GAOB-2(SC)	GJB-3(SC)
1	Moisture (%)	92.25	92.18	93.20
2	Colour of peel od/g	2.92	2.83	2.71
3	Poly Phenol Oxidase od/min/g	1.40	1.34	1.27
4	Glycoalkaloid od/g	0.47	0.37	0.34
5	TSS (Brix) %	9.00	8.00	8.00
6	Protein %	0.89	0.79	0.75
7	Acidity %	0.12	0.13	0.12
8	Total phenol mg/100g	28.12	26.70	27.14
9	Total soluble sugar (%)	4.12	4.03	3.48

Table 4: Reaction to little leaf disease recorded from 2012-13 to 2016-17 at Junagadh centers

Disease	Year	Incidence (%)		
		GRB-5	GAOB-2(SC)	GJB-3(SC)
Little leaf (%) (Junagadh)	2012-13	1.14	3.40	3.43
	2013-14	1.19	5.05	4.33
	2014-15	0.98	3.00	3.11
	2015-16	8.33	13.63	11.59
	2016-17	0.00	0.00	0.00
	Mean & Range	2.33(0.00-8.33)	5.02(0.00-13.63)	4.49(0.00-11.59)
No. of Jassids / leaf (Junagadh)	2012-13	1.64	2.25	2.60
	2013-14	2.01	2.17	2.73
	2014-15	1.39	3.16	2.22
	2015-16	1.90	2.15	3.10
	2016-17	2.11	3.16	3.07
	Mean & Range	1.81(1.64-2.11)	2.58(2.15-3.16)	2.74(2.22-3.10)
Name of Pest	Year	GRB-5	GAOB-2 (SC)	GJB-3(SC)
No. of whitefly / leaf (Junagadh)	2012-13	1.23	2.78	2.33
	2013-14	1.71	5.05	7.00
	2014-15	1.09	1.85	1.67
	2015-16	1.34	3.00	2.60
	2016-17	1.30	3.70	2.90
	Mean & Range	1.33(1.09-1.71)	3.28(1.85-5.05)	3.30(1.67-7.00)
% Fruit borer damage (Junagadh)	2012-13	1.18	4.16	6.66
	2013-14	1.09	4.12	5.58
	2014-15	1.12	4.36	6.25
	2015-16	0.00	0.46	0.74
	2016-17	0.00	3.00	4.80
	Mean & Range	0.68(0.00-1.18)	3.22(0.46-4.36)	4.81(0.74-6.66)

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