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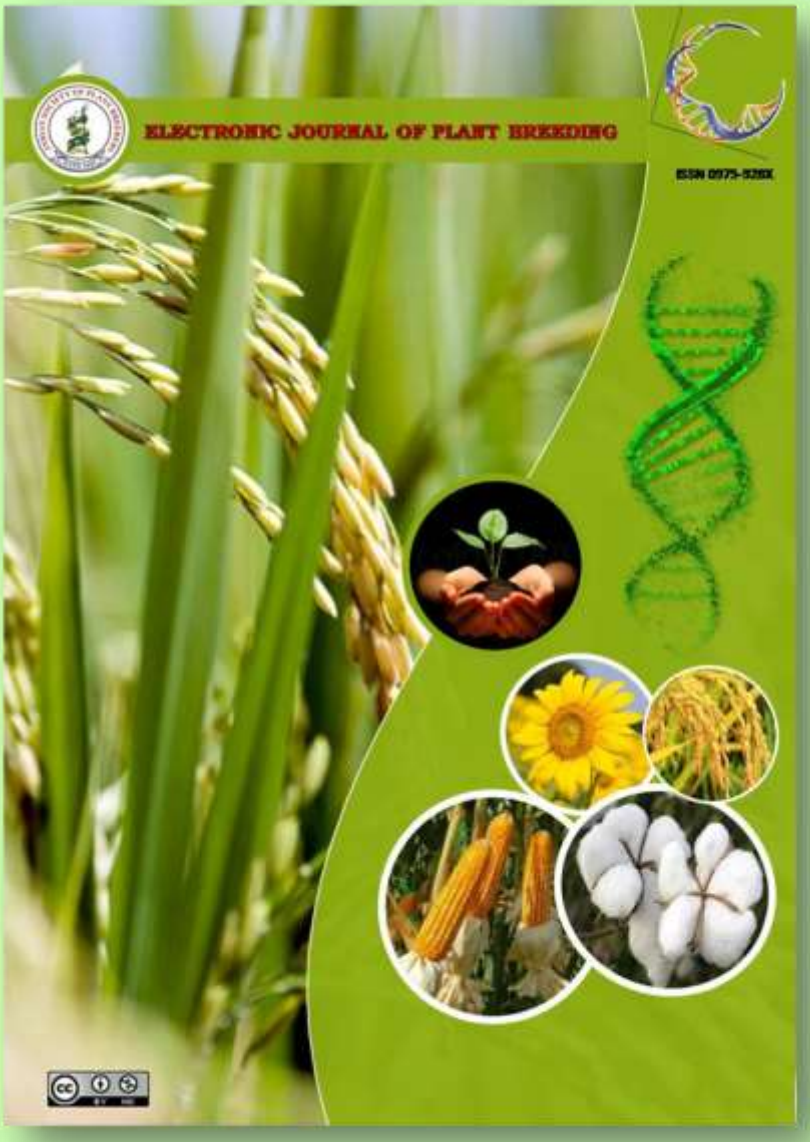

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Research Note

A new variety of Indian Bean-2 for Saurashtra and Middle Gujarat

J. H. Vachhani, R. K. Rathod, S. R. Jadeja, L. L. Jivani and L. S. Parmar
Vegetable Research Station, Junagadh Agricultural University, Junagadh-362001 (Gujarat)
E-Mail:vrs@jau.in

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Abstract
To boost-up Indian Bean production in the Gujarat state, a new high yielding Light green "Gujarat Junagadh Indian Bean-2"(GJIB-2) developed by Vegetable Research Station, Junagadh Agricultural University, Junagadh, which was evaluated under state and co-ordinated trials during 2004-05 to 2011-12 at various locations along with check variety Gujarat Papdi-1. On the basis of mean green pod yield data, GJIB-2 recorded the highest green pod yield of 112.46 q/ha as compared to check variety Gujarat Papdi-1 (89.56 q/ha), which was 25.57% higher. The pods of this culture are flat and medium long in shape with green colour. Flowers are white in colour. Regarding quality parameters; The Moisture (82.53%), Protein (4.69%), Acidity (2.26%), Total phenol mg/100g (32.64 mg/100g) and Total Soluble Sugar (2.23%) was more in fresh grain seeds of proposed culture as compared to check variety GP-1. The leaf spot disease intensity at Junagadh was 11.00% in GJIB-2 and it was less than the check variety GP-1 (13.19%). The leaf blight disease intensity was also less in culture GJIB-2 (11.52%) as compared to check variety GP-1 (13.40%). The mean data of Junagadh and Anand centers on pod borer damage indicated that, the pod borer damage was higher in proposed GJIB-2. It was 13.87% as compared to check variety GP-1 (11.68%). Number of mines per leaf at Junagadh was 3.36 in GJIB-2 and it was less than check variety GP-1 (4.52)

Key words
GJIB-2, Dolichos Bean, Pedigree, kharif, papadi,

Dolichos bean [*Lablab prupureus* (L.) Sweet] is an important leguminous vegetable of India and is mainly grown for its tender pods, which are cooked and consumed as vegetable. It is also called as *sem, hyacinth bean, field bean, Indian bean and avare*. Being leguminous vegetable, the immature green pods of dolichos bean is a good source of protein, minerals and vitamins (Basu *et al*., 1999). Based on historical evidences, India is considered as origin and primary centre of diversity for dolichos bean. It is also grown in homestead. It is a multipurpose crop grown as pulse, vegetable and forage. Field bean is a drought tolerant crop grown in dry lands with limited rainfall. The crop prefers relatively cool season when sowing done in July August. It starts fruiting in winter and continuous indeterminately in spring (Savitha, 2008). Despite having many good attributes, the crop has remained unexploited owing to low productivity, long duration, photosensitivity and indeterminate growth habit. The consumer preference also varies with pod size, shape, colour and aroma. The crop is mainly grown for its green pods, while the dry seeds are used in various vegetable preparations. It is one of the major sources of protein in South Indian dietary. A wide range of variations exist for the plant and pod characters amongst the accessions grown all over the country.

To develop high yielding and better quality Indian bean variety with light green colour and medium in size. JIB (P)-04-14 (Gujarat Junagadh Indian Bean-2) was developed by hybridization between JNDIB-88 x JNDIB-23 followed by pedigree method of selection. The cross was made during 1998 and its pedigree was 1998-7-7-18-14-13. This genotype was tested as an entry in Preliminary Evaluation Trial (PET) and promoted to Large Scale Varietal Trial (LSVT) and tested at multi locations *viz.*, Junagadh, Anand, Navsari, Waghai and Ladol centers in Gujarat State during 2004-05 to 2011-12. Because of its good performance in state trials, the entry JIB(P)-04-14 was tested under All-India Co-coordinated Varietal Trials under IET during 2010-11 and under AVT-I during 2011-12. The experiments were laid down in a Randomized Block Design with three replications. The experimental plot size was of 2.00 x 2.25 m^2 with a distance of 15 x 10 cm^2 spacing in a plot. All the recommended package of practices were followed to raise good crop. The analysis was performed following standard procedures as per Panse and Sukhatme (1985).

The results on pod yield of GJIB-2 along with State check variety Gujarat Papdi-1 in state trials are presented in Table 1. On the basis of pod yield data from the state level trials at Junagadh, Anand,

Navsari, Waghai and Ladol centers, GJIB-2 had proven its superiority by giving higher pod yield at all the centers. The mean pod yield of GJIB-2 was 112.46 q/ha as compared to state check variety Gujarat Papdi-1 (89.56 q/ha) in state trials (Table 1

and 2). A similar trend was reported by Ali *et al.* (2005) and Roy *et al.* (2006).

The pods of this genotype were flat and medium long in shape with green colour. Average pod length, girth and weight of this genotype was 9.44 cm, 2.13 cm. and 6.07 g, respectively (Table 3). The qualitative parameters of GJIB-2 were comparatively better than GP-1. The pods of this genotype had higher total sugar (1.82%) and protein (1.87%) as compared to 1.84% and 1.70% in GP-1, respectively. However, undesirable factor poly phenol-oxidase of GJIB-2 (0.133 od/min/g) was lower than check variety GP-1(0.142 od/min/g). These results are in close agreement with the findings of earlier researchers like Rathod *et al*, 2017 (Table 4a and 4b).

This variety showed lower incidence of pod borer (13.87%) as compared to check variety GP-1 (11.68%), the leaf minor incidence of the proposed variety was lower as compared to the check variety. Aphid infestation of the proposed variety was comparable to the check variety GP-1. These results are in close agreement with the findings of earlier researchers like Rathod *et al.* 2017 (Table 5).

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Table 1. Overall center wise yield performance of GJIB-2 in Gujarat State under State trials

Centers	Mean pod yield (q/ha)		% Incr. over GP-1 (SC)
	GJIB-2	GP-1 (SC)	
Junagadh	156.23 (7)	121.36 (7)	28.73
Anand	86.00 (4)	63.06 (4)	36.38
Navsari	72.62 (4)	71.73 (4)	01.24
Waghai	71.30 (1)	44.29 (1)	60.98
Ladol	**Data not considered due to below state average yield**		-
Overall Mean	**112.46 (16)**	**89.56 (16)**	**25.57**
Freq. in top NS group	**12/16**	**1/16**	
Sig. increase over check	**9/16**	**-**	

Table 2. Overall year wise yield performance of GJIB-2 at different locations of Gujarat State under State level trials

S. N.	Year	Mean Pod yield (q/ha)		% increase over the check GP-1
		GJIB-2	GP-1 (SC)	
1	2004-05	188.00 (1)	147.90 (1)	27.11
2	2005-06	143.11 (2)	102.82 (2)	39.18
3	2006-07	98.26 (1)	63.83 (1)	53.94
4	2007-08	78.44 (3)	71.89 (3)	09.11
5	2008-09	94.28 (1)	73.77 (1)	27.80
6	2009-10	109.08 (2)	103.29 (2)	05.60
7	2010-11	108.93 (4)	85.22 (4)	27.82
8	2011-12	121.72 (2)	89.38 (2)	36.18
Overall Mean		**112.46 (16)**	**89.56 (16)**	**25.57**

Table 3. Description of green pod the variety along with check

S.N.	Ancillary observations	GJIB-2	Gujarat Papdi-1 (SC)
1	Plant height(cm)	77.86	71.80
2	Plant spread(cm)	65.24	58.70
3	No. of branches / plant	5.55	5.27
4	Pod length (cm)	8.00	5.66
5	Pod width (cm)	1.997	1.356
6	Ten pod weight (g)	50.25	32.91
7	Pod yield per plant (kg)	1.124	0.872
8	No. of pods per plant	221.7	264.7
9	No. of seeds per pod	4.280	3.915
10	Days to first picking	91.00	90.70
11	Days to last picking	155.86	154.00

Table 4a. Quality parameters (Fresh grain seeds)

S. N.	Quality parameters	Varieties	
		GJIB-2	GP-1 (SC)
1	Moisture (%)	82.53	81.87
2	Dry matter (%)	17.47	18.13
3	TSS (BRIX) %	15.5	17
4	Poly Phenol Oxidase (od/min/g)	0.133	0.142
5	Glycoalkaloid (od/g)	0.26	0.32
6	Peel colour (od/g)	1.17	1.26
7	Ascorbic Acid (mg/100g)	15.98	16.04
8	Protein (%)	4.69	4.53
9	Acidity (%)	2.26	2.11
10	Total phenol (mg/100g)	32.64	31.11
11	Total soluble sugar (%)	2.23	2.06

Table 4b. Quality parameters (Fresh green pods)

S. N.	Quality Parameters	GJIB-2		Mean	GP-1 (SC)		Mean
		2010-11	2011-12		2010-11	2011-12	
1	Moisture (%)	87.44	89.52	88.48	86.49	87.44	86.97
2	Dry matter (%)	12.56	10.48	11.52	13.51	12.56	13.04
3	TSS (BRIX) %	10.5	10.0	10.25	11.1	11.5	11.30
4	Poly phenol oxidase (od/min/g)	0.128	0.139	0.133	0.132	0.152	0.142
5	Glycoalkaloid (od/g)	0.29	0.37	0.33	0.27	0.39	0.33
6	Peel colour (od/g)	1.11	1.29	1.20	1.26	1.33	1.30
7	Ascorbic Acid (mg/100g)	15.52	19.88	17.7	14.03	17.13	15.58
8	Protein (%)	1.82	1.92	1.87	1.71	1.68	1.70
9	Acidity (%)	2.79	2.63	2.71	3.11	2.87	2.99
10	Total phenol (mg/100g)	32.12	26.93	29.53	28.19	23.08	25.64
11	Total soluble sugar (%)	1.88	1.75	1.82	1.91	1.77	1.84

Table 5. Reaction to major pests recorded from 2008-09 to 2011-12 at Junagadh and 2008-09 to 2010-11 at Anand center

(I) Pod borer %

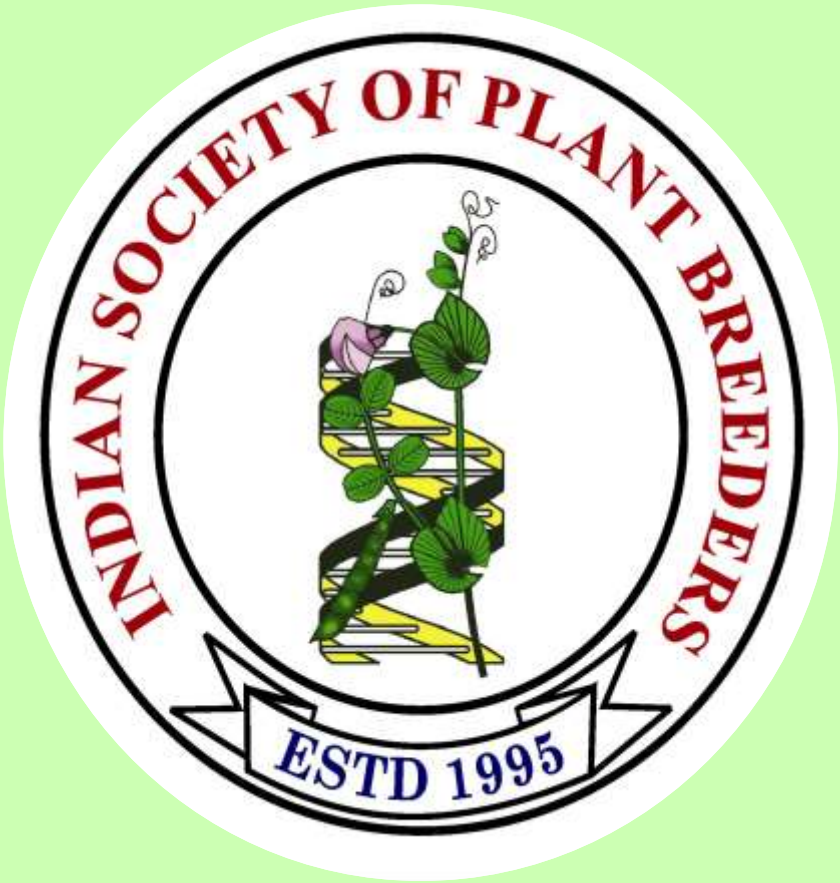
Pest	Year	GJIB-2	GP-1 (SC)
Junagadh	2008-09	7.66	9.00
	2009-10	9.67	12.33
	2010-11	11.00	9.67
	2011-12	13.33	16.00
	Mean	**10.42**	**11.75**
Anand	2008-09	6.19	7.89
	2009-10	33.88	21.08
	2010-11	15.36	5.79
	Mean	**18.48**	**11.59**
	Overall mean	**13.87**	**11.68**

(II) No. of Aphids per leaf

Pest	Year	GJIB-2	GP-1 (SC)
Junagadh	2008-09	7.00	8.67
	2009-10	9.67	10.00
	2010-11	8.67	9.67
	2011-12	2.75	1.75
	Mean	**7.02**	**7.52**
Anand	2008-09	2.80	3.97
	2010-11	11.84	4.43
	Mean	**7.32**	**4.20**
	Overall mean	**7.15**	**6.10**

(III) No. of mines per leaf (Leaf miner)

Pest	Year	GJIB-2	GP-1 (SC)
Junagadh	2008-09	2.50	3.50
	2009-10	2.67	3.33
	2010-11	4.00	6.50
	2011-12	4.25	4.75
	Mean	**3.36**	**4.52**



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