



A promising mungbean [*Vigna radiata* (L.) Wilczek.] genotype with high protein content and seed yield

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Mungbean [*Vigna radiata* (L.) Wilczek.] is grown mainly as a source of vegetable protein for its high protein content of about 23% [1]. Improved varieties with higher seed yield have, most often than not, lesser protein content. Selection from local land races for higher protein content and seed yield could be an alternative approach for evolving varieties with higher protein yield. We report here a mungbean genotype, BSN1, a pure line sorted out from a local land race, *Nagpuri* local and on its potential for higher yield of seeds with higher protein content (27.8%). This genotype has been registered by ICAR as a genetic stock (INGR 00011) for its genetic potential.

A set of 49 genotypes including 40 improved cultivars and nine local land races were tested in field trials in the *rabi* season of 1992 [2] and eight agronomic characters including seed yield and its component traits, viz., duration, plant height, primary branch number/plant, pod number/plant, pod length, seed number/pod and 100-seed weight were evaluated. Biometric analysis evidenced that selection for higher pod number, 100-seed weight and plant height could lead to higher seed yield. The land race, *Nagpuri* local collected from the Kalahandi district of Orissa emerged as a potential parent material as it ranked second in seed yield, first in 100-seed weight and fifth in plant height among the 49 genotypes evaluated. Besides, it ranked first in pod length and third in duration too. Critical observations revealed conspicuous genetic variability within *Nagpuri* local, particularly with regard to seed size. A pure line with bold seeds was sorted out, tested for homozygosity for four consecutive growing seasons and assigned the breeder's nomenclature, BSN1 [3] (Fig. 1).

BSN1 was studied with a set of 36 genotypes consisting of 27 improved varieties and nine local land races, selected from the previously described 49 genotypes [2] on the basis of diverse origin and relative

performance, and was assessed in a field trial conducted in the *rabi* season of 1994 [4]. BSN1 outperformed all 36 genotypes including its parent, *Nagpuri* local; the recommended varieties for this state; and other standard varieties in seed yield (Table 1). Our previous studies revealed that pod number, seed weight, plant height, and pod length are correlated with seed yield. BSN1 had the boldest seeds (Fig. 2) and the longest pods (Fig. 3) and also was among the leading cultivars in pod number and plant height. Excellence of BSN1 in seed yield and its component characters is most probably due to its plant architecture, particularly large dull green leaflets (Fig. 4), with optimum angle with the stem, contributing to higher photosynthetic efficiency.

Seeds of BSN1 contain as high as 27.8% of crude proteins (Table 1) and is expected to yield about 1.0g of protein/plant [1]. From the consumer point of view, protein weight/seed in this genotype is encouragingly high with 17.24mg of estimated protein/seed.

Banding pattern of BSN1 proteins as reported earlier [5] can be used in identification of this genotype and also in verification of hybridity in crossing programmes using this genotype as a male parent.

This genotype could be used as a donor for such traits as pod length and seed weight to improve other varieties. Besides, the puckering nature of the leaflets (Fig. 1) and hypocotyl pigmentation could serve as marker traits in breeding schemes. This genotype yields high in *rabi* season while low in summer/*kharif* season due to its high susceptibility to MYMV. Efforts are now being made to incorporate resistance genes into its genetic background through molecular breeding.

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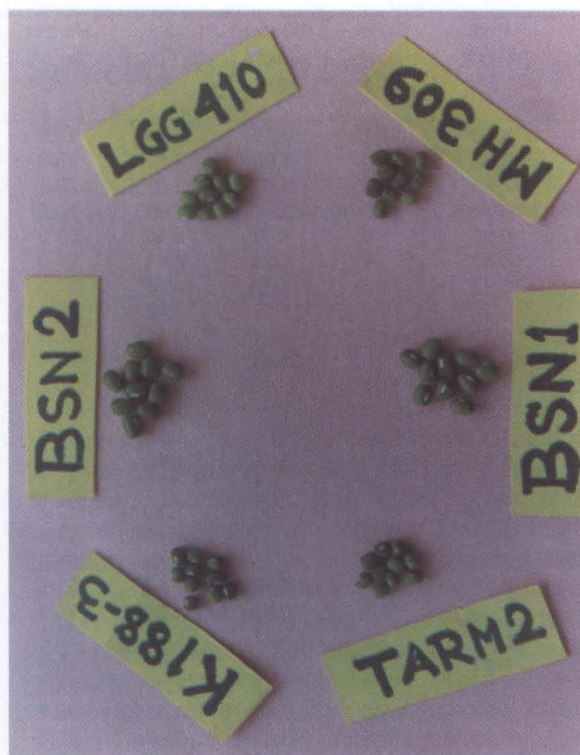


Fig. 2. Seeds of six genotypes of mungbean



Fig. 1. A plant of BSN1, a promising line selected from the land race, Nagpuri local



Fig. 3. Pods of six genotypes of mungbean



Fig. 4. Terminal leaflets of three genotypes of mungbean

Table 1. Performance of BSN1 as compared to its parent genotype and other cultivars in *rabi* season

Sl.No.	Genotype	Duration (DAS)	Plant height (cm)	Primary branch number/ plant	Pod number/ plant	Pod length (cm)	Seed number/ pod	100 seed weight (g)	Seed yield/plant (g)	Protein content (%)
1.	BSN 1	86	39.38	0.1	6.96	8.40	11.1	6.21	3.70	27.8
2.	PUSA 103	71	35.10	1.1	11.78	6.10	10.0	3.38	3.59	19.3
3.	Nagpuri	80	38.02	0.5	6.88	7.46	10.0	5.63	2.88	29.3
4.	LGG 410	84	32.52	0.1	8.58	6.19	11.0	3.47	2.85	20.0
5.	Bahalmung	69	26.68	2.3	10.56	6.85	11.0	2.70	2.50	23.3
6.	PUSA 108	71	37.92	0.4	6.79	6.50	11.8	3.56	2.41	21.0
7.	ML 538	71	38.72	0.6	6.57	6.93	11.6	3.97	2.38	20.5
8.	GDI 47-4	79	36.94	1.1	7.82	6.22	10.9	3.18	2.19	27.4
9.	CO 5	93	37.90	1.9	8.48	6.61	11.7	3.02	2.16	20.8
10.	ML 515	79	26.49	0.6	5.64	6.87	11.0	3.63	2.0	21.4
11.	T 44	74	44.89	0.8	6.13	6.24	11.7	3.40	1.96	20.2
12.	K 851	70	27.96	0.7	6.42	5.88	11.4	3.71	1.92	21.1
13.	Jyoti	75	39.55	0.3	4.95	6.83	11.3	3.44	1.88	20.3
14.	UPM 79-1-12	69	23.57	0.1	5.98	5.97	11.0	3.85	1.83	20.4
15.	OUM 6	77	40.91	1.0	5.13	6.50	10.7	3.56	1.71	24.2
16.	WGG 35	71	35.07	0.8	5.37	6.54	10.5	3.90	1.70	17.2
17.	MUS 288	69	33.11	0.4	5.39	5.82	9.4	3.83	1.70	27.4
18.	Kendrapara 2	68	21.33	1.6	5.87	6.40	10.3	2.63	1.61	21.5
19.	PDM 84-146	73	28.98	0.1	5.16	5.72	9.9	3.42	1.59	21.9
20.	Ratila 1	74	27.53	2.5	6.39	6.08	11.3	2.53	1.58	20.9
21.	COBG 2	79	40.85	1.3	5.08	6.69	11.6	3.81	1.51	24.7
22.	NARP 1	84	45.84	1.3	4.85	6.63	11.8	3.71	1.49	25.5
23.	Barbahal	70	34.55	1.3	5.34	6.28	10.7	3.17	1.49	24.8
24.	PS 16	71	34.56	0.1	5.38	5.82	10.6	3.16	1.44	22.8
25.	Kalamung	68	20.6	3.2	5.21	6.35	11.2	3.27	1.43	20.3
26.	TARM 2	68	27.55	0.9	5.41	6.12	9.9	3.35	1.36	22.1
27.	Dhauli	74	38.67	0.5	4.52	6.39	10.4	3.49	1.30	21.3
28.	ML 5	70	26.14	0.5	3.84	6.21	10.3	3.71	1.18	24.8
29.	MGG 332	71	16.79	0.1	3.86	6.92	10.9	3.51	1.14	25.9
30.	Ranpur	68	26.89	1.1	4.87	6.22	10.4	2.87	1.10	23.1
31.	TARM 18	66	23.12	0.5	3.78	5.77	9.4	3.53	1.09	27.6
32.	MH 309	68	24.28	0.4	3.60	6.21	10.4	3.40	1.01	22.8
33.	MGG 330	68	23.41	0.4	3.58	6.72	11.4	3.63	0.97	29.9
34.	ML 2	93	37.64	1.5	3.30	6.43	11.1	3.41	0.95	18.9
35.	WGG 37	76	20.65	0.1	2.55	6.91	11.8	3.27	0.88	22.5
36.	Jhainmung	93	28.51	1.2	3.23	6.55	11.2	3.57	0.70	18.6
37.	Karlakhman	70	30.63	1.0	2.31	6.18	11.0	3.10	0.61	23.1
	Average	74.595	31.709	0.876	5.610	6.446	10.857	3.54	1.724	22.827
	Range	66-93	16.79-45.84	0.1-3.2	2.31-11.78	5.72-8.40	9.4-11.8	2.53-6.21	0.61-3.70	17.2-29.9
	SE	1.229	1.224	0.120	0.330	0.084	0.108	0.111	0.119	0.572
	CV (%)	10.024	23.476	83.111	35.758	7.902	6.077	19.033	42.03	13.650

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