

B. Singh
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**ALL INDIA COORDINATED RESEARCH NETWORK
ON UNDERUTILIZED CROPS**

ANNUAL REPORT 2005



**National Bureau of Plant Genetic Resources
Pusa Campus, New Delhi - 110 012**

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ON UNDERUTILIZED CROPS**

**PROGRESS REPORT
2005**

Compiled By

Dr. Hanuman Lal

Dr. R.P. Dua

Dr. M. Dutta

Dr. B.S. Phogat

Dr. R.S. Rathi



**NATIONAL BUREAU OF PLANT GENETIC RESOURCES
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PREAMBLE

I. PREAMBLE

Underutilized crops constitute those plant species that occur as life support species in extreme environmental conditions or threatened habitats, having appropriate genetic make up to survive under such adverse situations and also possess promising nutritional or industrial utility for a variety of purposes for the present as well as the future needs of human kind. Their cultivation is restricted to specialized geographical pockets in different agro-ecological regions mainly by the poor farming communities, who have little access to modern agro-inputs and well organized marketing and communication infrastructure. Having superior nutritional quality, these crops provide household food and nutritional security to the millions of impoverished people living in remote corners of the country often in inhospitable terrains, where public distribution system is yet to reach.

The dependence of human kind on plant resources is inevitable. Since the dawn of agriculture, domestication and necessity based gathering of plant species have helped in the evolution of specially useful plant species. Living in close contact with the nature, human beings have learnt to use plants for food, fodder, fibre, medicine and other economic purposes. Over the years, these biological resources have been generously exploited for the advantage of mankind. So far, out of the estimated global wealth of 80,000 edible plant species, only about 150 have been widely used and of these only about 30 species provide 90 per cent of the food for the world's population. This has resulted in narrowing down of our food basket and restricted the options for future unforeseen times that may arise from the unpredictable global climatic changes and other natural catastrophes. Therefore, the underutilized plant species of economic importance are the key to sustainable agriculture in most of the developing countries facing acute resource crunch as well as rapid depletion of natural resources due to ever-increasing population, increased industrialization and urbanization. The population experts have predicted that the world population will grow by an unprecedented 90 million people per year, which is equivalent of Mexico's entire population in 1995. Unfortunately, changing land use patterns, rapidly increasing pressure on land both for agriculture and forestry, massive development projects as well as expanding demand for industrial and urban sectors have posed serious threat to the

existing agro-biodiversity, including the underutilized plant species that hold immense potential for future.

These plants do not require high input technology and can be raised with comparatively lower management cost on marginal, submarginal, degraded and various categories of wastelands on a sustainable basis. There are about 158 million hectares of wastelands of different kinds in India such as sand dunes, ravines, saline, alkali and acidic soils, marshy and marginal lands, which are unfit for supporting cultivation of high input demanding elite crops. Such lands can easily be put to use for growing low-input requiring underutilized crops to diversify present day agriculture in order to support ever-increasing population and to cater to the fast changing human needs.

The Consultative Group on International Agricultural Research (CGIAR) sponsored Workshop on the Role of Underutilized Crops in Enlarging the Basis of Food Security held at MSSRF, Chennai during 1999 also underlined the need to widen the species composition in the food basket and conserve important food and other plants for future posterity.

Recognizing the need for organised research effort on less common, under exploited crops, the All India Coordinated Research Project on Under Utilized and Under Exploited Plants was initiated during 1982 by ICAR. The Project was later redesignated as AICRP on Underutilized Crops and presently the project is conducting research on 17 crops of food, fodder and industrial value through 13 main, 6 cooperating and 2 voluntary centres located in diverse agro-climatic zones of the country. About 28 varieties in different crops have been released/identified in this project, besides identifying desirable genetic donors and accumulating indigenous and exotic germplasm collections. Planned multi-locational evaluation of the germplasm and breeding lines is a continuous process for developing high yielding superior genotypes and their improved production technologies suitable for various agro-ecological situations representing high mountains to the desert plains.

The present report embodies results of research work undertaken on germplasm evaluation, breeding and agronomic aspects, quality evaluation, and other studies in various underutilized crops at different centres. The compiled report is an outcome of the concerted efforts made by the scientists of AICRP,

Cooperating and Voluntary centres. I express my sincere thanks to Drs. M. Dutta, B.S. Phogat and M.K. Deen, Technical Programme Leaders for Plant Breeding, Agronomy and Quality Analysis for compilation of the report on respective disciplines. I am extremely thankful to Dr. H. Lal, Scientist and Dr. R.S. Rathi, Technical Officer of the unit for helping in preparation of the report.

I would like to acknowledge with reverence and gratitude the encouragement and guidance received, on all aspects of organization and functioning of the project from Dr. Mangala Rai, Director General, ICAR & Secretary, DARE; Dr. G. Kalloo, DDG (CS & Hort.), ICAR; Dr. S.N. Shukla, ADG (FFC), ICAR and Dr. A.K. Singh, Director, NBPGR.

I wish to record my appreciation to Mr. Satya Prakash and Ms. Amita for typing the report neatly.

R.P. Dua
Nodal Officer

PLANT BREEDING

II. PLANT BREEDING

On the basis of indigenous economic importance, area covered by a crop, specific adaptive advantage and future potential, underutilized crops have been prioritized specifically over the years, for the mountain as well as the plain areas of the country. These include food and fodder crops, energy and industrial plants and crop species suitable for problematic areas. Among the economically important indigenous as well as introduced plant species, the promising material are included in the coordinated testing programme. Besides, conducting Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) in important crops like amaranth, buckwheat, rice bean and faba bean, multi-locational Observation Rows and Germplasm Screening Nurseries are also conducted in the crops requiring explorative investigation. An account of the experiments conducted during rabi 2004-2005 in plains and during *kharif* 2005, both in the hills as well as in the plains are enumerated below:

2.1 HILLS

The crops included in the hill areas are the pseudocereals (grain amaranth, buckwheat and chenopods); grain legumes (rice bean, faba bean and adzuki bean); oil-seed crop (*Perilla*) and dual purpose food and fodder crop (*Coix*). These crops are taken up in the kharif season in hill areas of North-Western and North-Eastern Himalayas. Replicated data were received from the centres. Statistical analysis was carried out to estimate mean, CD (at 5% level) and CV (%). For overall comparison, mean over locations have been calculated. For the varieties qualifying for consideration of identification on the basis of three years performance, the weighted means in respect of grain yield and maturity have been given in the Annexures.

2.1.1 GRAIN AMARANTH (*Amaranthus* spp.)

Grain amaranth is as important crop in mid and high altitude regions of North-Western Himalaya. It is a multipurpose crop grown for its green foliage and grain. Its seeds being rich in protein and essential amino acids are used for various confectionary items and other food products.

An IVT trial was conducted during kharif, 2005. Although many species of grain amaranth are economically important, but three species, namely, *A. hypochondriacus*, *A. caudatus* and *A. edulis* being the important grain yielding types, are included in the testing programmes.

2.1.1.1 Initial Varietal Trial (IVT)

In this trial 10 entries, including four checks were tested at five locations. The performance of the entries as compared to the checks has been given in table 1. Based on the overall mean performance in respect of grain yield, none of the entries showed yield superiority over the best check variety, IC35407.

Significant differences were observed among the entries for seed yield at all the locations (Table 2). Mean seed yield level was high at Shimla (31.73 q/ha) and moderate at Sangla (15.22 q/ha), Ranichauri (11.57 q/ha) and Almora (11.17 q/ha); while, it was considerably low at Palampur (5.59 q/ha). Based on the average performance over locations the check IC 35407 was the highest yielder followed by PRA 3. On individual centres, Annapurna was the highest yielder at Shimla (37.31 q/ha), IC35407 at Almora (23.58 q/ha); PRA-3 at Sangla (22.51 q/ha) and Palampur (8.07 q/ha) and PRA-2 at Ranichauri (18.66 q/ha).

Average plant height of the entries (Table 3) was highest at Shimla (201.72 cm) followed by Sangla (165.93 cm) and Palampur (132.82 cm). It was lowest at Ranichauri (104.77 cm) centre. The plant height at Shimla ranged from 186.40 cm to 200.28 cm and at Sangla from 146.33 cm to 179.73 cm. Based on average performance over the five locations PRA 2005-1 had the highest plant height (158.94 cm).

Flowering time showed considerable variation among the locations as well as among the entries within a location. The mean flowering time was the lowest (66.63 days) at Ranichauri while it was the longest (83.43 cm) at Shimla (Table 4). The variation in flowering time among the entries was wider at Shimla (60.67 – 115.00 days) and Almora (53.67 – 112.00 days). The entry VL-0344 showed consistence for early flowering over the locations and ranked first (47.87 days) based on the overall performance.

Maturity period also showed similar trend as the flowering time. The average maturity period of the entries over all the locations was 129.41 days (Table 5). The earliest flowering entry, VL-0344 was earliest in maturity also (95.07 days). The average maturity period was the minimum at Almora (101.75 days) while, it was the longest at Shimla (154.11 days).

The length of inflorescence (Table 6) of the entries was the highest at Shimla (60.87 cm) followed by Sangla (56.73 cm) and Almora (55.50 cm). Inflorescence length was the lowest (49.37 cm) at Ranichauri. Based on the average over five locations PRA 2005-1 had the longest inflorescence (60.22 cm) and VL-0344 the shortest (43.33 cm).

Test weight (Table 7) expressed in terms of weight of 10 ml seed recorded at five centres showed that it was the highest at Ranichauri (11.09 g) and low to moderate at Palampur (7.08 g), Shimla (7.81 g), Sangla (8.74 g) and Almora (8.42 g) centres. The variation among the entries was relatively low. Based on the average over five locations entry, LPKBS-04-55 (9.00 g) showed the highest test weight.

Number of fingers per inflorescence (Table 8) was highest at Shimla (76.51) followed by Sangla centre (59.09). Based on the average over the locations Check Annapurna had the highest number of fingers (55.64).

2.1.2 BUCKWHEAT (*Fagopyrum* spp.)

Buckwheat is a multi-utility pseudocereal crop grown extensively in the higher hills. In addition to its foliage and grain, it produces a glucoside called *rutin*, which has a medicinal value against cardio-vascular ailments.

2.1.2.1 Initial Varietal Trial and Advanced Varietal Trial (AVT-I)

The Initial Varietal Trial and Advanced Varietal Trial was conducted with 14 entries including four checks at four locations viz. Shimla, Ranichauri, Almora and Sangla. The summary of various entries in respect of grain yield and other important traits as compared to the checks have been given in table 9. SAGAB-101 and SAGAB-117 were superior to the best check variety, Shimla B-1 (C).

Data on grain yield have been presented in table 10. Significant differences were observed among the entries with respect to grain yield at all the locations. Seed yield at Ranichauri was comparatively low. Among the four locations highest yield was recorded at Shimla (14.80 q/ha) followed by Sangla (13.46 q/ha) and Almora (10.51 q/ha).

Average plant height (Table 11) was recorded to be the highest at Sangla (132.67 cm) followed by at Almora (96.37 cm). The entry SAGAB 214 was the tallest (129.30 cm) while VL 7 (87.54 cm) was the shortest.

Flowering time varied from 56.00 to 77.00 days at Sangla, from 27.00 to 70.67 days at Ranichauri, from 44.00 to 67.67 days at Shimla and 22.00 to 45.00 days at Almora centre (Table 12). Mean flowering time was the earliest at Almora (38.73 days) followed by Ranichauri (51.37 days). On the basis of average over three locations check variety VL-7 was the earliest in flowering (38.25 days).

Maturity period (Table 13) also showed similar trend as that of flowering time. Average maturity period was the earliest at Almora (77.37 days) followed by Ranichauri (107.17 days). On the basis of average over the locations the check variety VL-7 was earliest in maturity (79.00 days) followed by Shimla B-1 (81.85 days).

The average test weight was recorded to be higher at Sangla (2.91 g) than other centres (Table 14). On the basis of average over the locations SAGAB 214 possessed the highest (3.19 g) and SMLBW 3 the lowest (1.73 g) test weight.

2.1.3 CHENOPODIUM (*Chenopodium* spp.)

In chenopodium two species viz. *C. quinoa* and *C. album* are economically important and hence have been included in the evaluation programme. An Initial Varietal Trial and Advanced Varietal Trial comprising both the species was proposed to be conducted at three locations.

2.1.3.1 Initial Varietal Trial and Advanced Varietal Trial

The Initial Varietal Trial and Advanced Varietal Trial comprising eight lines was conducted at three centres. However, the data have been received from one centre only. The entries comprised of the lines received from NBPGR Regional Station, Shimla. The performance of the entries has been summarized in table 15. The grain yield (Table 16) varied from 1.75 to 11.26 q/ha. The line IC 417754 (11.29 q/ha) was the highest yielding entry followed by SMLCP 2 (10.52 q/ha) and SMLCP 6 (9.78 q/ha).

Average plant height was the highest for SMLCP 6 (287.0 cm) and lowest (139.18 cm) for SMLCP-1 (Table 16) at Shimla.

Flowering time varied from 84.00 to 109.00 days and maturity period from 107.33 to 134.67 days (Table 16). The entry IC 417754 was earliest in maturity. Inflorescence length showed less variation ranging from 40.77 to 69.07 cm. The entry, IC 107299 (69.07 cm) had longest earhead followed by IC 108086 (55.97 cm) and SMLCP 7 (55.97 cm).

2.1.4 RICE BEAN (*Vigna umbellata*)

Rice bean is an important grain legume of low and mid hill regions having multifarious utility. It is mainly suitable for mid hill regions where traditional pulses like black gram and green gram cannot be grown successfully. One Initial Varietal Trial was conducted during this year.

2.1.4.1 Initial Varietal Trial

The Initial Varietal Trial comprising four entries and four checks was conducted at 6 locations. Data have been received from all the centres. However, the data in respect of seed yield from Shillong centre were not included due to high C.V. The summary performance of the entries has been presented in table 17.

Significant variations were observed among the entries with respect to grain yield at all the locations (Table 18). Yield levels at Shimla centre were highest with an average yield of 22.37 q/ha while it was lowest (3.48 q/ha) at Ranichauri centre. The yield levels at Almora centre was also low (5.81 q/ha).

On the basis of average over five locations VRB-1 (11.78 q/ha) was the highest yielder followed by BRS-1 (10.54 q/ha) and the check variety PRR 2 (10.54 q/ha).

Plant height (Table 19) was the highest at Shimla showing an average of 142.05 cm while it was the lowest at Bhowali (71.87 cm) centre. At Almora centre also plant height was considerably high (123.42 cm). On the basis of average over six locations RBL-6 showed the highest plant height (115.98 cm) while Totru local had the shortest plant height (57.56 cm).

Flowering time was the earliest at Shillong (63.75 days) and extremely delayed at Shimla (94.24 days) showing more than 31 days difference between the two centres (Table 20). On the basis of average over six locations VRB-1 (69.33 days) showed the earliest flowering. However, on five location data Tatra local (58.53 days) was the earliest in flowering.

Maturity period was the earliest at Shillong (98.17 days) and most delayed (157.75 days) at Ranichauri (Table 21). There was a difference of about 59 days in maturity between Shillong and Ranichauri centres. Based on the average over six locations VRB-2 was the earliest maturing (123.78 days) variety while based on four location data Totru local (77.67 days) had the earliest maturity.

The mean 100-seed weight was the highest at Palampur (7.20 g) centre and the lowest at Almora (4.25 g) centre (Table 22). On the basis of average over six locations RBL-1 had the largest seed (6.93 g) and Totru local (4.42 g) the smallest seed based on five location data.

2.1.5 ADZUKIBEAN (*Vigna angularis*)

Adzuki bean is a short duration pulse crop generally grown mixed with rice bean in the North-Western Himalayan region. An Initial Varietal Trial along with Advance Trial-I was planned to be conducted in adzuki bean at three locations.

2.1.5.1 Initial Varietal Trial and Advance Varietal Trial-I

The Initial Varietal Trial and Advanced Varietal Trial-I comprising 15 lines including one check (HPU 51) was conducted at three locations. Data have been

received from all the three locations. The summary of performance of various entries during the year has been presented in table 23.

The average yield (Table 24) levels at Shimla were highest (11.20 q/ha), followed by Palampur (7.93 q/ha) and were very low at Ranichauri (1.45 q/ha). The range of variation (3.98 – 12.50 q/ha) in yield was very high at Palampur. Significant differences were, however, observed for seed yield of the entries at all the locations. On the basis of three locations data SMLAB-4 (8.42 q/ha) was the highest yielding entry followed by HPU 51 (C) (8.29 q/ha). Among two IVT entries EC340255 was the highest yielder (7.89 q/ha).

Plant height (Table 25) was highest at Palampur (61.62 cm) followed by Shimla (44.45 cm) and Ranichauri (36.89 cm). Based on the average over the locations the entry, SMLAB-7 had the maximum plant height (53.51 cm) followed by SMLAB 6 (50.94 cm) and SMLAB 9 (50.41 cm).

Flowering time (Table 26) was the earliest at Palampur (48.69 days) followed by Ranichauri (53.76 days) and Shimla (57.22 days). Considerable variation was observed in flowering time of the lines at all the centres. It ranged from 52.00 to 63.33 days at Shimla, 48.33 to 59.33 days at Ranichauri and 41.00 to 55.67 days at Palampur. Based on the overall average, the entry IC241041 was the earliest in flowering time (48.67 days).

Maturity period (Table 27) of the entries also showed similar trend as was observed for flowering time. Entries took minimum time (89.93 days) to mature at Palampur, Ranichauri maximum and at Shimla (106.44 days). Based on the average over the locations the entry, IC241041 (95.89 days) was the earliest maturing followed by the entry SMLAB 10 (98.33 days).

The average test weight (100-seed weight) was highest (Table 28) at Ranichauri (13.18 g) followed by at Shimla (12.87 g) and at Palampur centre (11.76 g). The entry SMLAB-7 (16.48 g) had the highest seed weight based on the average over locations, and it was statistically superior to check at all the centres.

2.1.6 FABA BEAN (*Vicia faba*)

Faba bean is grown in the hills mainly for its protein rich green pods which are used as vegetable. An Initial Varietal Trial was proposed to be conducted at Palampur and Ranichauri. But data were received only from Palampur.

2.1.6.1 Initial Varietal Trial

The Initial Varietal Trial on 19 lines including three checks was conducted at one centre. The performance of the entries has been summarized in Table 29. The seed yield (Table 30) varied from 10.73 to 26.37 q/ha. HB-43 had the highest seed yield (26.37 q/ha).

Average plant height was maximum for HB-43 (70.40 cm) and lowest for Local Check (44.48 cm). HB-43 had earliest flowering time (88.50) and maturity period (163.00).

2.1.7 JOB'S TEAR (*Coix lacryma-jobi*)

Job's tear, widely grown in the North-Eastern Himalayan region, is being exploited as a dual purpose crop both for its seed and forage purposes. Germplasm Evaluation Nursery was proposed to be conducted in this crop at three locations and the data have been presented under germplasm.

2.1.8 PERILLA (*Perilla frutescens*)

Perilla is being exploited as an edible oil yielding underutilized crop which is grown in the hills largely as a spice crop. Its green leaves also contain highly aromatic compounds. In Perilla a Germplasm Evaluation Nursery was proposed to be conducted at two hill locations and the data have been presented under germplasm.

Table 1. Performance of Grain Amaranth entries in Initial Varietal Trial (IVT) during 2005 (Hills)

S.No.	Genotypes	Mean maturity duration (days)	Mean weight of 10ml seed (g)	Mean grain yield over locations (q/ha)		Percent increase / decrease over check variety			
				Mean	Location	Annapurna	PRA 2	PAR 3	IC 35407
1	IC042264	130.67	8.65	14.86	5	-14.95	-13.21	-18.32	-22.21
2	LPKBS-04-55	141.00	9.00	3.26	3	-81.35	-80.97	-82.09	-82.94
3	LPKBS-04-60	146.25	8.46	8.62	4	-50.64	-49.63	-52.60	-54.86
4	PRA 2005-1	131.13	8.78	13.22	5	-24.31	-22.76	-27.31	-30.77
5	PRA 2005-2	133.40	8.40	13.24	5	-24.24	-22.69	-27.23	-30.70
6	VL 0344	95.07	6.53	17.69	5	1.26	3.33	-2.75	-7.38
7	Annapurna (C)	130.13	8.82	17.47	5	0.00	2.04	-3.96	-8.53
8	PRA 2 (C)	127.13	8.67	17.12	5	-2.00	0.00	-5.88	-10.37
9	PRA 3 (C)	129.67	8.75	18.19	5	4.12	6.25	0.00	-4.76
10	IC035407 (C)	117.80	8.80	19.10	5	9.33	11.57	5.00	0.00
Mean		129.41	8.63	15.06					

Table 2. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Palampur	Almora	Ranichauri	Mean	Rank	Location	Frequency
1	IC042264	16.00	31.97	6.60	6.59	13.13	14.86	6	5	0/5
2	LPKBS-04-55	1.67	—	4.50	—	3.61	3.26	10	3	0/3
3	LPKBS-04-60	0.66	24.27	3.99	—	5.58	8.62	9	4	0/4
4	PRA 2005-1	14.93	27.97	2.78	9.66	10.77	13.22	8	5	0/5
5	PRA 2005-2	15.90	25.99	4.89	8.52	10.89	13.24	7	5	0/5
6	VL 0344	16.59	34.74	6.68	21.56	8.88	17.69	3	5	0/5
7	Annapurna (C)	20.00	37.31	7.55	6.39	16.11	17.47	4	5	
8	PRA 2 (C)	22.01	31.06	7.59	6.26	18.66	17.12	5	5	
9	PRA 3 (C)	22.51	36.05	8.07	6.81	17.50	18.19	2	5	
10	IC035407 (C)	21.90	36.19	3.28	23.58	10.55	19.10	1	5	
	Mean	15.22	31.73	5.59	11.17	11.57	15.06			
	CD (5%)	2.26	2.12	0.84	2.79	3.13				
	CV (%)	8.67	3.86	8.75	14.24	15.76				

Table 3. Plant height (cm) in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Palampur	Almora	Ranichauri	Mean	Rank
1	IC042264	157.60	202.84	145.67	98.67	116.67	144.29	3
2	LPKBS-04-55	172.27	—	135.07	102.33	104.67	128.58	9
3	LPKBS-04-60	167.37	217.82	139.60	88.00	95.33	141.62	6
4	PRA 2005-1	179.40	228.28	121.00	136.00	130.00	158.94	1
5	PRA 2005-2	170.67	197.73	127.13	129.67	87.33	142.51	4
6	VL 0344	0.00	186.40	123.53	147.33	89.33	109.32	10
7	Annapurna (C)	164.60	204.11	119.07	98.67	119.33	141.16	8
8	PRA 2 (C)	167.33	204.73	141.20	107.00	87.00	141.45	7
9	PRA 3 (C)	167.80	202.40	132.73	100.00	120.00	144.59	2
10	IC035407 (C)	146.33	171.15	143.20	153.67	98.00	142.47	5
	Mean	165.93	201.72	132.82	116.13	104.77	144.27	
	CD (5%)	20.02	18.36	10.79	22.30	41.33		
	CV (%)	6.97	5.26	4.74	11.20	23.01		

Table 4. Days to 50% flowering in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Palampur	Almora	Ranichauri	Mean	Rank
1	IC042264	72.00	94.00	66.67	60.00	61.00	70.73	5
2	LPKBS-04-55	82.67	—	72.00	110.00	77.33	85.50	9
3	LPKBS-04-60	78.67	86.00	73.67	112.00	81.33	86.33	10
4	PRA 2005-1	79.67	87.20	69.33	63.00	66.00	73.04	6
5	PRA 2005-2	72.33	115.00	70.33	64.00	66.33	77.60	8
6	VL 0344	—	67.00	61.33	53.67	57.33	47.87	1
7	Annapurna (C)	67.00	83.00	82.33	65.33	70.67	73.67	7
8	PRA 2 (C)	66.67	74.33	67.33	60.67	60.00	65.80	3
9	PRA 3 (C)	72.00	83.67	72.00	59.67	59.67	69.40	4
10	IC035407 (C)	68.00	60.67	57.00	62.00	66.67	62.87	3
	Mean	73.22	83.43	69.20	71.03	66.63	72.70	
	CD (5%)	1.64	4.48	2.94	3.65	1.74		
	CV (%)	1.30	3.10	2.48	2.99	1.53		

Table 5. Days to maturity in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Palampur	Almora	Ranichauri	Mean	Rank	Location	Frequency
1	IC042264	128.67	158.33	117.67	105.67	143.00	130.67	6	5	0/5
2	LPKBS-04-55	142.00	—	119.33	—	161.67	141.00	9	3	0/3
3	LPKBS-04-60	140.00	159.33	118.33	—	167.33	146.25	10	4	0/4
4	PRA 2005-1	129.67	158.67	116.67	104.00	146.67	131.13	4	5	0/5
5	PRA 2005-2	128.33	171.00	117.00	104.00	146.67	133.40	8	5	0/5
6	VL 0344	—	148.00	98.00	90.00	139.33	95.07	1	5	2/5
7	Annapurna (C)	125.00	158.33	119.00	107.00	141.33	130.13	5	5	
8	PRA 2 (C)	124.00	158.33	118.00	99.33	136.00	127.13	3	5	
9	PRA 3 (C)	129.00	158.67	118.33	107.00	135.33	129.67	4	5	
10	IC035407 (C)	123.33	116.33	105.33	97.00	147.00	117.80	2	5	
	Mean	130.00	154.11	114.77	101.75	146.43	129.41			
	CD (5%)	1.68	2.77	3.03	1.85	1.88				
	CV (%)	0.75	1.04	1.54	1.04	0.75				

Table 6. Inflorescence length (cm) in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Palampur	Almora	Ranichauri	Mean	Rank
1	IC042264	55.80	63.07	62.27	52.33	53.00	57.29	2
2	LPKBS-04-55	55.67	—	51.53	53.33	55.33	53.97	5
3	LPKBS-04-60	59.87	59.55	48.40	44.00	47.67	51.90	9
4	PRA 2005-1	60.53	65.76	55.80	61.00	58.00	60.22	1
5	PRA 2005-2	57.60	66.83	52.73	59.00	48.33	56.90	3
6	VL 0344	0.00	61.11	52.53	61.67	41.33	43.33	10
7	Annapurna (C)	55.73	58.57	45.00	50.00	54.33	52.73	7
8	PRA 2 (C)	60.13	58.15	54.47	56.33	39.33	53.68	6
9	PRA 3 (C)	59.67	58.47	55.80	56.33	50.67	56.19	4
10	IC035407 (C)	45.60	56.29	55.00	61.00	45.67	52.71	8
	Mean	56.73	60.87	53.35	55.50	49.37	55.16	
	CD (5%)	11.79	7.14	6.51	12.72	11.27		
	CV (%)	12.01	6.77	7.12	13.37	13.31		

Table 7. Seed volume weight (g/ 10ml) in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Palampur	Almora	Ranichauri	Mean	Rank
1	IC042264	9.00	7.93	7.00	8.50	10.80	8.65	7
2	LPKBS-04-55	8.67	—	7.18	8.43	11.74	9.00	1
3	LPKBS-04-60	7.67	7.98	7.09	—	11.10	8.46	8
4	PRA 2005-1	8.33	7.80	7.13	—	11.86	8.78	4
5	PRA 2005-2	9.00	7.42	7.03	8.40	10.13	8.40	9
6	VL 0344	—	7.50	6.83	8.43	9.87	6.53	10
7	Annapurna (C)	8.67	8.03	7.95	8.37	11.10	8.82	2
8	PRA 2 (C)	8.67	7.87	6.94	8.33	11.52	8.67	6
9	PRA 3 (C)	9.00	8.01	6.72	8.40	11.64	8.75	5
10	IC035407 (C)	9.67	7.79	6.93	8.50	11.11	8.80	3
	Mean	8.74	7.81	7.08	8.42	11.09	8.63	
	CD (5%)	2.03	0.25	0.17	0.29	0.02		
	CV (%)	13.39	1.86	1.39	1.93	0.08		

Table 8. Number of fingers/plant in Initial Varietal Trial (IVT) on Grain Amaranth : 2005 (Hills)

S.No.	Genotypes	Sangla	Shimla	Almora	Ranichauri	Mean	Rank
1	IC042264	60.00	88.00	31.33	22.67	50.50	5
2	LPKBS-04-55	67.33	—	33.00	24.67	41.67	10
3	LPKBS-04-60	68.87	81.44	47.67	22.33	55.08	2
4	PRA 2005-1	54.80	79.89	59.33	19.67	53.42	4
5	PRA 2005-2	64.93	53.22	54.67	22.33	48.79	7
6	VL 0344	33.40	87.22	60.00	14.00	48.66	8
7	Annapurna (C)	76.13	77.77	45.67	23.00	55.64	1
8	PRA 2 (C)	65.33	58.22	43.00	19.67	46.56	9
9	PRA 3 (C)	65.07	72.55	41.33	22.33	50.32	6
10	IC035407 (C)	35.00	90.33	71.67	18.00	53.75	3
	Mean	59.09	76.51	48.77	20.87	51.31	
	CD (5%)	14.40	10.94	21.34	6.50		
	CV (%)	14.21	8.26	25.52	18.16		

Table 9. Performance of Buckwheat entries in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) during 2005 (Hills)

S.No.	Genotypes	Mean maturity duration (days)	Mean weight of 10ml seed (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety			
				Mean	Location	Himpriya	PRB1	Shimla B-I	VL7
IVT									
1	B-121	108.42	2.33	9.77	4	-23.03	-1.34	-33.33	66.96
2	B-125	105.00	2.46	10.88	4	-14.26	9.90	-25.73	85.99
3	IC274439	108.67	1.94	13.52	4	6.55	36.57	-7.71	131.12
4	SMLBW-4	108.08	2.16	12.63	4	-0.46	27.59	-13.78	115.92
5	SMLBW-5	109.92	2.33	12.66	4	-0.20	27.92	-13.56	116.48
AVT - I									
6	SMLBW-3	113.00	1.73	13.66	4	7.61	37.94	-6.78	133.44
7	SAGAB-101	111.00	2.58	18.96	2	49.42	91.53	29.43	224.12
8	SAGAB-117	113.50	2.99	15.73	2	23.96	58.90	7.38	168.90
9	SAGAB-212	117.33	2.80	8.26	2	-34.90	-16.55	-43.61	41.22
10	SAGAB-214	121.67	3.19	9.22	2	-27.35	-6.87	-37.07	57.60
11	Himpriya (C)	116.50	2.56	12.69	4	0.00	28.18	-13.38	116.92
12	PRB-I (C)	111.58	2.12	9.90	4	-21.95	0.00	-32.42	69.23
13	Shimla B-I (C)	81.83	2.08	14.65	4	15.46	47.98	0.00	150.43
14	VL 7 (C)	79.00	2.47	5.85	4	-53.87	-40.91	-60.07	0.00
Trial Mean		107.54	2.41	12.03					

Table 10. Grain yield (q/ha) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Buckwheat : 2005 (Hills)

S.No.	Genotypes	Sangla	Ranichauri	Shimla	Almora	Mean	Rank	Location	Frequency
IVT									
1	B-121	18.33	4.72	7.20	8.81	9.77	11	4	0/4
2	B-125	12.10	5.69	17.67	8.06	10.88	9	4	0/4
3	IC274439	16.67	12.50	14.87	10.04	13.52	5	4	0/4
4	SMLBW-4	22.96	4.91	14.61	8.05	12.63	8	4	¼
5	SMLBW-5	16.32	4.91	20.36	9.07	12.66	7	4	0/4
AVT – I									
6	SMLBW-3	21.25	9.35	14.68	9.34	13.66	4	4	0/4
7	SAGAB-101	22.10	—	15.82	—	18.96	1	2	½
8	SAGAB-117	17.91	—	13.55	—	15.73	2	2	0/2
9	SAGAB-212	4.82	—	11.70	—	8.26	13	2	0/2
10	SAGAB-214	5.21	—	13.23	—	9.22	12	2	0/2
11	Himpriya (C)	15.75	4.63	19.60	10.78	12.69	6	4	
12	PRB-I (C)	2.43	5.88	18.69	12.62	9.90	10	4	
13	Shimla B-I (C)	19.79	2.78	18.06	17.98	14.65	3	4	
14	VL 7 (C)	3.82	2.13	7.11	10.35	5.85	14	4	
	Mean	13.46	5.75	14.80	10.51				
	CD (5%)	2.09	1.01	0.97	3.81				
	CV (%)	9.27	10.24	3.90	21.12				

Table 11. Plant height (cm) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Buckwheat : 2005 (Hills)

S.No.	Genotypes	Sangla	Ranichauri	Shimla	Almora	Mean	Rank
IVT							
1	B-121	165.40	79.67	88.33	81.00	103.60	11
2	B-125	128.99	99.33	99.10	91.00	104.61	7
3	IC274439	145.33	95.33	89.98	85.00	103.91	10
4	SMLBW-4	131.27	103.33	83.05	84.00	100.41	12
5	SMLBW-5	146.20	88.00	81.67	102.00	104.47	9
AVT – I							
6	SMLBW-3	123.47	112.33	87.12	95.00	104.48	8
7	SAGAB-101	113.33	—	78.73	—	96.03	13
8	SAGAB-117	154.33	—	82.18	—	118.26	3
9	SAGAB-212	112.37	—	127.88	—	120.13	2
10	SAGAB-214	116.66	—	141.93	—	129.30	1
11	Himpriya (C)	165.65	105.33	67.88	103.00	110.47	6
12	PRB-I (C)	121.80	116.67	87.67	132.00	114.53	4
13	Shimla B-I (C)	129.08	80.33	131.35	104.00	111.19	5
14	VL 7 (C)	114.45	71.33	82.37	82.00	87.54	14
Mean		132.67	95.17	94.95	96.37		
CD (5%)		16.59	17.69	13.42	14.28		
CV (%)		7.47	10.84	8.40	8.64		

Table 12. Days to flowering in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Buckwheat : 2005 (Hills)

S.No.	Genotypes	Sangla	Ranichauri	Shimla	Almora	Mean	Rank
IVT							
1	B-121	74.00	55.67	60.67	45.00	58.83	8
2	B-125	67.00	42.67	63.33	41.00	53.50	4
3	IC274439	75.00	65.00	62.33	39.00	60.33	10
4	SMLBW-4	65.00	52.00	62.33	41.00	55.08	5
5	SMLBW-5	67.00	65.67	65.33	41.00	59.75	9
AVT – I							
6	SMLBW-3	67.00	60.00	66.33	40.00	58.33	6
7	SAGAB-101	74.67	—	63.00	—	68.83	14
8	SAGAB-117	68.00	—	65.33	—	66.67	13
9	SAGAB-212	56.00	—	61.33	—	58.67	7
10	SAGAB-214	59.00	—	62.00	—	60.50	11
11	Himpriya (C)	77.00	70.67	67.67	41.00	64.08	12
12	PRB-I (C)	58.00	41.33	62.33	38.00	49.92	3
13	Shimla B-I (C)	56.00	33.67	44.00	38.00	42.92	2
14	VL 7 (C)	58.00	27.00	46.00	22.00	38.25	1
	Mean	65.31	51.37	60.86	38.73		
	CD (5%)	0.50	2.03	2.34	1.77		
	CV (%)	0.46	2.30	2.28	2.66		

Table 13. Days to maturity in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Buckwheat : 2005 (Hills)

S.No.	Genotypes	Sangla	Ranichauri	Shimla	Almora	Mean	Rank	Location	Frequency
IVT									
1	B-121	120.00	110.00	116.67	87.00	108.42	5	4	3/4
2	B-125	121.33	103.67	116.00	79.00	105.00	3	4	4/4
3	IC274439	125.00	117.33	116.33	76.00	108.67	6	4	4/4
4	SMLBW-4	124.00	115.33	107.00	86.00	108.08	4	4	3/4
5	SMLBW-5	130.00	118.67	115.00	76.00	109.92	7	4	3/4
AVT - I									
6	SMLBW-3	126.67	118.00	126.33	81.00	113.00	10	4	3/4
7	SAGAB-101	117.33	—	104.67	—	111.00	8	2	2/2
8	SAGAB-117	120.67	—	106.33	—	113.50	11	2	2/2
9	SAGAB-212	122.00	—	112.67	—	117.33	13	2	2/2
10	SAGAB-214	128.00	—	115.33	—	121.67	14	2	2/2
11	Himpriya (C)	132.00	122.33	132.67	79.00	116.50	12	4	
12	PRB-I (C)	108.00	122.33	133.00	83.00	111.58	9	4	
13	Shimla B-I (C)	92.00	74.67	89.67	71.00	81.83	2	4	
14	VL 7 (C)	98.00	69.33	92.67	56.00	79.00	1	4	
	Mean	118.20	107.17	113.17	77.37				
	CD (5%)	2.34	2.60	2.98	4.52				
	CV (%)	1.19	1.41	1.56	3.40				

Table 14. 100 seed weight (g) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Buckwheat : 2005 (Hills)

S.No.	Genotypes	Sangla	Ranichauri	Shimla	Almora	Mean	Rank
IVT							
1	B-121	3.93	1.81	1.76	1.80	2.33	8
2	B-125	3.53	2.39	1.93	2.00	2.46	7
3	IC274439	1.80	2.06	1.99	1.90	1.94	13
4	SMLBW-4	3.00	1.95	2.07	1.60	2.16	10
5	SMLBW-5	3.27	2.09	2.16	1.80	2.33	9
AVT – I							
6	SMLBW-3	1.73	2.18	1.73	1.30	1.73	14
7	SAGAB-101	3.27	—	1.90	—	2.58	4
8	SAGAB-117	4.00	—	1.98	—	2.99	2
9	SAGAB-212	3.13	—	2.46	—	2.80	3
10	SAGAB-214	3.87	—	2.52	—	3.19	1
11	Himpriya (C)	3.33	3.24	2.06	1.60	2.56	5
12	PRB-I (C)	2.07	2.41	2.10	1.90	2.12	11
13	Shimla B-I (C)	2.87	1.85	1.79	1.80	2.08	12
14	VL 7 (C)	1.92	1.87	2.99	3.10	2.47	6
Mean		2.91	2.18	2.10	1.88		
CD (5%)		0.46	0.02	0.14	0.20		
CV (%)		9.50	0.52	3.85	6.10		

Table 15. Performance of Chenopodium entries in Initial Varietal Trial (IVT) and Advance Varietal Trial (AVT) during 2005 (Hills)

S.No.	Genotypes	Mean maturity duration (days)	Mean plant height (cm)	Mean yield over locations		Percent increase / decrease over check variety
				Mean	Location	
IVT						
1	SMLCP-7	134.00	234.28	8.62	1	-23.44
2	IC107299	131.66	277.23	3.02	1	-73.20
3	IC108086	131.67	169.07	3.23	1	-71.29
4	MCH-1	134.67	180.68	1.75	1	-84.46
6	SMLCP-6	129.66	287.00	9.78	1	-13.17
AVT - I						
6	SMLCP-1	122.00	139.18	5.85	1	-48.01
7	SMLCP-2	133.33	188.56	10.52	1	-6.60
8	SMLCP-5	132.00	243.93	7.22	1	-35.89
9	IC417754 (Check)	107.33	204.01	11.26	1	0.00
Trial Mean		128.48	213.77	6.81		

Table 16. Different characters of Chenopodium entries in Initial Varietal Trial (IVT) and Advance Varietal Trial (AVT) during 2005 at Shimla (Hills)

S.No.	Genotypes	Days to flowering	Days to maturity	Plant height (cm)	Inflorescence length (cm)	Grain yield (q/ha)	Rank
IVT							
1	SMLCP-7	99.33	134.00	234.28	55.97	8.62	4
2	IC107299	101.00	131.66	277.23	69.07	3.02	8
3	IC108086	98.00	131.67	169.07	55.97	3.23	7
4	MCH-1	109.33	134.67	180.68	49.40	1.75	9
5	SMLCP-6	98.00	129.66	287.00	57.93	9.78	3
AVT – I							
6	SMLCP-1	84.00	122.00	139.18	49.48	5.85	6
7	SMLCP-2	99.00	133.33	188.56	54.03	10.52	2
8	SMLCP-5	94.67	132.00	243.93	40.77	7.22	5
9	IC417754 (Check)	84.33	107.33	204.01	46.38	11.26	1
Mean		96.41	128.48	213.77	53.22	6.81	
CD (5%)		3.38	5.85	37.35	15.15	0.67	
CV (%)		2.03	2.63	10.09	16.44	5.67	

Table 17. Performance of Rice bean entries in Initial Varietal Trial (IVT) during 2005 (Hills)

S.No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety			
				Mean	Location	PRR-1	PRR-2	RBL-1	RBL-6
1	BRS-1	126.67	6.36	10.54	5	0.82	-0.04	33.71	21.52
2	Totru local	77.67	4.42	2.79	5	-73.29	-73.52	-64.58	-67.80
3	VRB-1	123.78	6.48	11.78	5	12.74	11.78	49.51	35.89
4	VRB-2	129.61	4.60	5.91	5	-43.43	-43.91	-24.98	-31.81
5	PRR- 1 (C)	125.61	5.69	10.45	5	0.00	-0.85	32.61	20.53
6	PRR-2 (C)	126.67	6.64	10.54	5	0.86	0.00	33.76	21.57
7	RBL-1 (C)	132.72	6.93	7.88	5	-24.59	-25.24	0.00	-9.11
8	RBL-6 (C)	133.17	6.53	8.67	5	-17.03	-17.74	10.03	0.00
Trial Mean		126.20	6.14	9.31					

Table 18. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Rice bean : 2005 (Hills)

S.No.	Genotypes	Almora	Bhowali	Ranichauri	Palampur	Shillong*	Shimla	Mean	Rank	Location	Frequency
1	BRS-1	8.89	7.68	0.87	8.88	3.70	26.35	10.54	2	5	0/5
2	Totru local	1.61	0.00	5.26	7.09	3.07	0.00	2.79	8	5	0/5
3	VRB-1	10.57	7.87	3.09	12.95	3.66	24.43	11.78	1	5	0/5
4	VRB-2	2.35	5.37	2.70	4.13	2.91	15.01	5.91	7	5	0/5
5	PRR- 1 (C)	9.11	6.30	4.56	8.08	10.19	24.18	10.45	4	5	0/5
6	PRR-2 (C)	6.78	9.08	4.94	10.71	6.16	21.22	10.54	3	5	0/5
7	RBL-1 (C)	2.22	5.28	3.95	4.81	4.20	23.14	7.88	6	5	0/5
8	RBL-6 (C)	4.97	7.59	2.51	6.04	12.64	22.26	8.67	5	5	0/5
	Mean	5.81	7.02	3.48	7.84	5.82	22.37	9.31			
	CD (5%)	1.69	1.34	0.66	0.81	5.80	2.94				
	CV (%)	16.57	10.71	10.81	5.86	56.83	7.37				

* Data from Shillong not included in the overall mean due to high CV.

Table 19. Plant height (cm) in Initial Varietal Trial (IVT) on Rice bean : 2005 (Hills)

S.No.	Genotypes	Almora	Bhowali	Ranichauri	Palampur	Shillong	Shimla	Mean	Rank
1	BRS-1	146.33	94.40	101.00	85.27	96.37	146.27	111.61	3
2	Totru local	54.00	27.20	60.00	52.80	93.82	—	57.56	8
3	VRB-1	133.00	74.77	111.67	81.53	119.48	137.10	109.59	4
4	VRB-2	115.00	40.87	72.33	58.87	80.23	123.47	81.79	7
5	PRR- 1 (C)	130.00	53.83	94.00	94.40	97.83	142.20	102.04	6
6	PRR-2 (C)	129.00	99.73	95.33	85.33	113.27	135.27	109.66	5
7	RBL-1 (C)	139.00	79.07	96.00	95.27	127.47	152.17	114.83	2
8	RBL-6 (C)	141.00	105.10	101.00	80.33	110.53	157.90	115.98	1
	Mean	123.42	71.87	91.42	79.23	104.87	142.05	102.14	
	CD (5%)	23.45	39.54	2.31	10.39	25.38	26.62		
	CV (%)	13.36	31.34	1.44	7.47	13.78	10.53		

Table 20. Days to flowering in Initial Varietal Trial (IVT) on Rice bean : 2005 (Hills)

S.No.	Genotypes	Almora	Bhowali	Ranichauri	Palampur	Shillong	Shimla	Mean	Rank
1	BRS-1	64.67	69.00	74.33	71.00	60.67	95.67	72.56	4
2	Totru local	54.00	80.67	47.67	52.00	58.33	—	58.53	1
3	VRB-1	63.00	66.33	65.67	67.33	62.00	91.67	69.33	2
4	VRB-2	68.67	69.00	75.00	78.67	64.67	95.33	75.22	4
5	PRR- 1 (C)	63.67	65.33	63.67	72.33	60.67	94.67	70.06	3
6	PRR-2 (C)	64.33	68.00	65.00	72.00	71.67	95.33	72.72	5
7	RBL-1 (C)	71.67	68.00	70.00	79.67	64.00	93.33	74.44	6
8	RBL-6 (C)	71.67	69.00	70.67	79.67	68.00	93.67	75.44	8
	Mean	65.21	69.42	66.50	71.58	63.75	94.24	71.78	
	CD (5%)	1.44	3.41	1.82	3.44	3.68	5.62		
	CV (%)	0.82	2.80	1.56	2.74	3.29	3.35		

Table 21. Days to maturity in Initial Varietal Trial (IVT) on Rice bean : 2005 (Hills)

S.No.	Genotypes	Almora	Bhowali	Ranichauri	Palampur	Shillong	Shimla	Mean	Rank	Location	Frequency
1	BRS-1	110.67	124.00	167.33	113.33	92.00	152.67	126.67	5	6	0/6
2	Totru local	86.00	—	117.33	95.00	90.00	—	77.67	1	5	0/5
3	VRB-1	96.67	124.67	161.00	112.67	92.33	155.33	123.78	2	6	0/6
4	VRB-2	105.00	127.33	166.33	131.33	92.00	155.67	129.61	6	6	0/6
5	PRR- 1 (C)	104.33	119.67	157.33	113.00	105.67	153.67	125.61	3	6	0/6
6	PRR-2 (C)	100.00	126.67	160.00	112.33	105.00	156.00	126.67	4	6	0/6
7	RBL-1 (C)	113.67	126.33	166.33	130.33	105.33	154.33	132.72	7	6	0/6
8	RBL-6 (C)	112.00	130.67	166.33	133.00	103.00	154.00	133.17	8	6	0/6
	Mean	103.54	125.62	157.75	117.63	98.17	154.52	126.20			
	CD (5%)	2.88	8.39	2.31	1.33	3.71	3.66				
	CV (%)	1.64	3.75	0.83	0.65	2.16	1.33				

Table 22. 100 seed weight (g) in Initial Varietal Trial (IVT) on Rice bean : 2005 (Hills)

S.No.	Genotypes	Almora	Bhowali	Ranichauri	Palampur	Shillong	Shimla	Mean	Rank
1	BRS-1	4.30	6.80	7.45	7.06	4.90	7.63	6.36	5
2	Totru local	4.20	—	6.47	5.23	6.20	—	4.42	8
3	VRB-1	4.60	6.57	7.40	8.21	5.90	6.22	6.48	4
4	VRB-2	3.40	5.10	4.85	5.83	3.93	4.48	4.60	7
5	PRR- 1 (C)	3.60	5.80	6.13	7.06	5.67	5.88	5.69	6
6	PRR-2 (C)	3.50	7.00	7.17	8.42	6.00	7.73	6.64	2
7	RBL-1 (C)	5.50	6.63	7.27	7.79	5.77	8.61	6.93	1
8	RBL-6 (C)	4.90	7.20	6.37	7.98	7.07	5.68	6.53	3
	Mean	4.25	6.44	6.64	7.20	5.68	6.60	6.14	
	CD (5%)	—	0.97	0.02	0.73	0.91	0.10		
	CV (%)	NR	8.48	0.14	5.79	9.10	0.88		

Table 23. Performance of Adzuki bean entries in Initial Varietal Trial (IVT) and Advance Varietal Trial (AVT) during 2005 (Hills)

S.No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety
				Mean	Location	
IVT						
1	EC290251	99.44	12.54	6.17	3	-25.51
2	EC340255	99.22	10.41	7.89	3	-4.82
AVT - I						
3	HPAB-21	102.56	13.27	6.12	3	-26.13
4	HPAB-25	102.78	15.09	5.64	3	-31.91
5	HPAB-30	99.11	10.91	7.92	3	-4.49
6	IC241041	95.89	11.45	6.10	3	-26.40
7	SMLAB-1	101.56	12.82	6.83	3	-17.59
8	SMLAB-4	99.56	11.80	8.42	3	1.51
9	SMLAB-5	104.33	11.62	6.74	3	-18.70
10	SMLAB-6	98.67	11.93	7.34	3	-11.49
11	SMLAB-7	103.44	16.48	5.79	3	-30.14
12	SMLAB-8	99.11	12.97	6.14	3	-25.95
13	SMLAB-9	101.00	13.66	7.25	3	-12.54
14	SMLAB-10	98.33	11.61	6.24	3	-24.68
15	HPU 51(C)	99.67	12.52	8.29	3	0.00
Trial Mean		100.31	12.60	6.86		

Table 24. Seed yield (q/ha) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Adzuki bean : 2005 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank	Location	Frequency
IVT								
1	EC290251	9.03	7.89	1.60	6.17	10	3	1/3
2	EC340255	13.15	9.17	1.35	7.89	4	3	1/3
AVT – I								
3	HPAB-21	5.60	11.52	1.25	6.12	12	3	0/3
4	HPAB-25	7.22	8.16	1.55	5.64	15	3	0/3
5	HPAB-30	12.50	9.90	1.36	7.92	3	3	1/3
6	IC241041	5.87	10.96	1.47	6.10	14	3	0/3
7	SMLAB-1	3.98	15.01	1.51	6.83	7	3	0/3
8	SMLAB-4	10.05	13.83	1.37	8.42	1	3	0/3
9	SMLAB-5	8.05	10.76	1.40	6.74	8	3	0/3
10	SMLAB-6	6.80	13.58	1.63	7.34	5	3	1/3
11	SMLAB-7	5.51	10.09	1.78	5.79	13	3	0/3
12	SMLAB-8	7.64	9.34	1.44	6.14	11	3	0/3
13	SMLAB-9	7.31	13.57	0.87	7.25	6	3	0/3
14	SMLAB-10	5.92	10.83	1.98	6.24	9	3	1/3
15	HPU 51(C)	10.28	13.37	1.21	8.29	2	3	0/3
Mean		7.93	11.20	1.45	6.86			
CD (5%)		0.84	0.84	0.15	0.61			
CV (%)		6.30	4.48	6.00	5.59			

Table 25. Plant height (cm) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Adzuki bean : 2005 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank
IVT						
1	EC290251	57.87	45.41	36.33	46.54	11
2	EC340255	52.10	38.69	33.67	41.49	15
AVT – I						
3	HPAB-21	60.40	41.92	33.00	45.11	13
4	HPAB-25	70.20	40.01	35.33	48.51	6
5	HPAB-30	56.67	44.04	33.33	44.68	14
6	IC241041	62.47	45.21	36.67	48.12	7
7	SMLAB-1	62.67	48.66	36.00	49.11	5
8	SMLAB-4	62.40	47.94	31.67	47.34	8
9	SMLAB-5	57.13	43.67	35.67	45.49	12
10	SMLAB-6	69.53	42.94	40.33	50.94	2
11	SMLAB-7	71.93	47.26	41.33	53.51	1
12	SMLAB-8	52.80	49.25	39.00	47.02	9
13	SMLAB-9	65.67	45.91	39.67	50.41	3
14	SMLAB-10	58.47	40.82	41.00	46.76	10
15	HPU 51(C)	64.06	44.98	40.33	49.79	4
	Mean	61.62	44.45	36.89	47.65	
	CD (5%)	7.14	12.26	8.10	9.17	
	CV (%)	6.92	9.12	13.12	9.72	

Table 26. Days to flowering in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Adzuki bean : 2005 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank
IVT						
1	EC290251	51.00	58.00	50.00	53.00	10
2	EC340255	50.00	56.67	47.67	51.44	3
AVT – I						
3	HPAB-21	55.67	58.67	56.67	57.00	14
4	HPAB-25	51.67	63.33	59.33	58.11	15
5	HPAB-30	46.33	56.67	52.00	51.67	4
6	IC241041	45.67	52.00	48.33	48.67	1
7	SMLAB-1	41.00	57.00	55.33	51.11	2
8	SMLAB-4	50.67	56.33	54.33	53.78	11
9	SMLAB-5	43.33	56.00	59.33	52.89	9
10	SMLAB-6	55.00	58.00	54.33	55.78	12
11	SMLAB-7	44.00	57.67	54.00	51.89	6
12	SMLAB-8	52.00	57.33	49.33	52.89	8
13	SMLAB-9	52.33	57.33	58.67	56.11	13
14	SMLAB-10	48.67	56.67	50.00	51.78	5
15	HPU 51(C)	43.00	56.67	57.00	52.22	7
	Mean	48.69	57.22	53.76	53.22	
	CD (5%)	3.56	3.46	3.31	3.45	
	CV (%)	4.37	3.62	3.68	3.89	

Table 27. Days to maturity in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Adzuki bean : 2005 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank	Location	Frequency
IVT								
1	EC290251	91.00	105.67	101.67	99.44	7	3	0/3
2	EC340255	91.33	106.00	100.33	99.22	6	3	0/3
AVT – I								
3	HPAB-21	92.33	109.00	106.33	102.56	12	3	0/3
4	HPAB-25	90.00	107.67	110.67	102.78	13	3	0/3
5	HPAB-30	88.33	105.67	103.33	99.11	5	3	0/3
6	IC241041	90.00	102.00	95.67	95.89	1	3	1/3
7	SMLAB-1	89.67	108.00	107.00	101.56	11	3	0/3
8	SMLAB-4	91.67	104.33	102.67	99.56	8	3	0/3
9	SMLAB-5	92.33	107.33	113.33	104.33	15	3	0/3
10	SMLAB-6	86.67	104.67	104.67	98.67	3	3	0/3
11	SMLAB-7	93.33	112.33	104.67	103.44	14	3	0/3
12	SMLAB-8	90.00	106.00	101.33	99.11	4	3	0/3
13	SMLAB-9	88.33	106.33	108.33	101.00	10	3	0/3
14	SMLAB-10	87.33	107.00	100.67	98.33	2	3	0/3
15	HPU 51(C)	86.67	104.67	107.67	99.67	9	3	0/3
Mean		89.93	106.44	104.56	100.31			
CD (5%)		3.18	2.88	3.39	3.15			
CV (%)		2.12	1.62	1.94	1.89			

Table 28. 100 seed weight (g) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Adzuki bean : 2005 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank
AVT						
1	EC290251	12.85	11.87	12.90	12.54	7
2	EC340255	9.23	9.32	12.68	10.41	15
IVT – I						
3	HPAB-21	12.82	13.56	13.42	13.27	4
4	HPAB-25	13.83	15.87	15.55	15.09	2
5	HPAB-30	9.83	11.28	11.61	10.91	14
6	IC241041	12.33	10.35	11.67	11.45	13
7	SMLAB-1	11.17	14.08	13.21	12.82	6
8	SMLAB-4	10.83	11.39	13.17	11.80	10
9	SMLAB-5	10.50	10.96	13.39	11.62	11
10	SMLAB-6	10.83	13.31	11.63	11.93	9
11	SMLAB-7	14.58	17.72	17.12	16.48	1
12	SMLAB-8	11.33	14.37	13.22	12.97	5
13	SMLAB-9	13.12	14.45	13.41	13.66	3
14	SMLAB-10	11.00	11.59	12.23	11.61	12
15	HPU 51(C)	12.17	12.86	12.53	12.52	8
	Mean	11.76	12.87	13.18	12.60	
	CD (5%)	0.55	0.20	0.02	0.26	
	CV (%)	2.80	0.94	0.08	1.27	

Table 29. Performance of Faba bean entries in Initial Varietal Trial (IVT) during 2005 (Hills)

S.No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety		
				Mean	Location	Local	VH-82-I	Vikrant
1	BSH-9	165.00	33.94	15.18	1	2.50	-14.24	41.47
2	HB-115	166.25	35.28	18.66	1	25.96	5.40	73.86
3	HB-123	165.25	34.77	19.70	1	32.98	11.27	83.55
4	HB-131	166.50	35.29	15.18	1	2.46	-14.27	41.43
5	HB-180	165.75	36.97	22.07	1	48.99	24.66	105.64
6	HB-193	165.50	37.05	15.55	1	5.00	-12.15	44.92
7	HB405	165.25	32.85	11.47	1	-22.55	-35.20	6.90
8	HB-428	166.50	36.20	10.73	1	-27.55	-39.38	0.00
9	HB43	163.00	32.25	26.37	1	78.02	48.95	145.71
10	HB-430	165.25	35.35	21.03	1	41.96	18.79	95.95
11	HB-504	168.75	36.71	15.55	1	5.00	-12.15	44.92
12	HB-509	163.50	34.35	10.37	1	-30.01	-41.44	-3.40
13	HB-521	166.00	33.81	14.79	1	-0.14	-16.44	37.84
14	NDF-I	164.50	32.48	12.21	1	-17.56	-31.02	13.79
15	PRT-12	164.50	33.40	10.74	1	-27.52	-39.35	0.05
16	PRT-7	164.25	33.70	11.11	1	-25.02	-37.26	3.49
17	Local (C)	169.00	38.18	14.81	1	0.00	-16.33	38.02
18	VH-82-I (C)	164.00	34.29	17.70	1	19.51	0.00	64.96
19	Vikrant (C)	165.50	33.50	10.73	1	-27.55	-39.38	0.00
Trial Mean		165.49	34.75	15.26				

Table 30. Different characters of Faba bean entries in Initial Varietal Trial (IVT) during 2005 at Palampur (Hills)

S.No.	Genotype	Days to germination	Days to 50 % flowering	Days to 50% pod formation	Days to maturity	Plant height	100 seed weight (g)	Primary branches	Green yield/plant	Seed yield/plant	Green pod yield kg/plot	Green pod yield (q/ha)	Seed yield kg/plot	Seed yield (q/ha)	Rank
1	BSH-9	14.75	102.75	115.00	165.00	58.15	33.94	3.35	82.00	24.30	1.75	25.93	1.03	15.18	9
2	HB-115	13.00	95.00	113.25	166.25	64.80	35.28	2.75	102.50	25.35	2.35	34.80	1.26	18.66	5
3	HB-123	13.25	90.00	113.25	165.25	68.30	34.77	2.35	70.00	30.80	1.70	25.18	1.33	19.70	4
4	HB-131	11.50	95.75	113.50	166.50	59.84	35.29	3.10	72.00	23.55	1.60	23.69	1.03	15.18	8
5	HB-180	14.25	91.75	113.00	165.75	70.40	36.97	2.20	139.00	30.95	2.45	36.29	1.49	22.07	2
6	HB-193	13.50	90.00	113.25	165.50	64.15	37.05	3.05	103.50	20.55	1.75	25.93	1.05	15.55	6
7	HB405	13.50	88.75	112.25	165.25	65.90	32.85	3.15	79.50	14.25	1.80	26.66	0.78	11.47	14
8	HB-428	14.25	93.25	114.00	166.50	63.70	36.20	3.10	70.50	14.90	1.65	24.44	0.73	10.73	16
9	HB43	12.50	88.50	113.25	163.00	74.13	32.25	3.05	110.00	40.35	2.48	36.69	1.78	26.37	1
10	HB-430	14.75	93.75	112.00	165.25	62.35	35.35	2.80	54.00	34.25	1.90	28.14	1.42	21.03	3
11	HB-504	16.25	89.75	113.00	168.75	64.95	36.71	3.45	122.50	21.20	2.40	35.55	1.05	15.55	7
12	HB-509	14.50	95.25	113.25	163.50	68.83	34.35	3.65	48.50	16.60	1.90	28.13	0.70	10.37	19
13	HB-521	15.75	95.25	114.75	166.00	60.95	33.81	3.05	40.50	16.25	1.75	25.91	1.10	14.79	11
14	NDF-I	15.75	96.00	115.50	164.50	52.10	32.48	2.60	55.00	14.95	1.38	20.36	0.83	12.21	13
15	PRT-12	16.50	90.50	112.00	164.50	62.60	33.40	3.10	90.50	16.30	2.18	32.22	0.73	10.74	18
16	PRT-7	15.25	101.50	115.50	164.25	58.30	33.70	3.35	60.50	13.15	1.35	19.99	0.58	11.11	15
17	Local (C)	16.00	102.25	116.00	169.00	44.48	38.18	2.90	85.50	22.70	1.85	27.41	1.00	14.81	10
18	VH-82-I (C)	13.50	96.00	113.50	164.00	56.90	34.29	2.35	45.50	14.80	1.45	21.85	0.93	13.70	12
19	Vikrant (C)	14.50	92.75	112.75	165.50	59.75	33.50	2.45	53.00	13.25	2.25	33.32	0.73	10.73	17
	Mean	14.38	94.14	113.63	165.49	62.13	34.75	2.94	78.13	21.50	1.89	28.02	1.03	15.26	
	CD (5%)	1.39	3.77	10.18	3.17	8.83	0.44	0.56	15.77	4.14	0.24	3.55	0.18	2.85	
	CV (%)	6.98	2.89	6.47	1.38	10.26	0.91	13.71	9.61	9.16	5.95	6.03	8.13	8.90	

2.2 PLAINS

The Varietal Trials and Germplasm Screening Nursery were constituted in grain amaranth, ricebean, faba bean, Kalingada, Kankoda and Tumba. Most of the experiments were conducted during the kharif 2005 season. However, in some crops such as faba bean and grain amaranth, experiments were conducted during the rabi 2004-2005 season at most of the centres except at Bangalore, Muttupalayam and Rahuri.

2.2.1 GRAIN AMARANTH (*Amaranthus spp.*)

In grain amaranth a combined trial including Initial Varietal Trial and Advanced Varietal Trial was conducted during Rabi 2004-05 and kharif 2005.

2.2.1.1 Initial Varietal Trial and Advanced Varietal Trial : Rabi 2004-05

The Trial comprising 22 entries including three checks was conducted at eight locations. Data have been received from all the centres. The summary of performance of the entries has been presented in table 31.

Significant differences were observed among the entries for grain yield at all the centres. Seed yield levels were high at S.K. Nagar (21.59 q/ha) followed by Faizabad (13.09 q/ha), Rahuri (11.86 q/ha) and Bhubaneshwar (10.39 q/ha) (Table 32). However, it was low at most of the other centres. The overall average showed that among IVT entries, IC268307 (14.94 q/ha) was the highest yielder followed by RMA 7 (13.69 q/ha), Phule GA 2004 (13.36 q/ha) and RMA-8 (11.86 q/ha). Among AVT-1 entries, RMA 3 (12.54 q/ha) was the highest yielder followed by SKNA-21 (12.52 q/ha) and RMA4 (12.04 q/ha).

Plant height was the highest at S.K. Nagar (139.40 cm) and the lowest at Ambikapur (60.67 cm) centre (Table 33). On the basis of average over the locations PLP-1 (124.39 cm) had the highest plant height whereas Shimla A-4 had the lowest height (53.17 cm).

Flowering time was the earliest at Mandor (46.84 days) followed by at S.K. Nagar (47.88 days) and Rahuri (60.40 days); while it was moderately late at Ranchi, Ambikapur, Faizabad and Bhubaneshwar centres (Table 34). On the

basis of average over locations Annapurna was the earliest flowering (54.56 days) followed by PRA 2004-2 (55.14 days).

Maturity period was the earliest at S.K. Nagar (96.49 days) followed by Bhubanweshwar (99.51 days) (Table 35). Phule GA-2004 (116.01 days) and Annapurna (116.47 days) were the earliest maturing lines.

Test weight (Table 36) as measured by the weight of 10 ml seed showed maximum mean value at S.K. Nagar (10.82 g) and minimum at Hisar (6.96 g). Based on the average over three locations Shimla-A-3 had the highest seed weight (9.07 g) but over six locations PRA 2004-1 had highest test weight (8.75 g). Among the AVT-1 entries, SKNA21 had the maximum test weight (8.00 g).

Inflorescence length of the entries showed significant difference at Mandor and Faizabad (Table 37). Based on the average over locations SKMA-21 (41.90 cm) had the longest inflorescence and PLP-1 (29.67 cm) the shortest.

2.1.1.2 Initial Varietal Trial (IVT) : Kharif - 2005

In this trial 12 entries, including four checks, were tested at three locations. The performance of the entries as compared to the checks has been summarized in table 38. No entry showed yield superiority over the best check variety, GA-1.

Significant differences were observed among the entries for seed yield at all the locations (Table 39). Mean seed yield level was high at Rahuri (8.28 q/ha), followed by at Bangalore and Mettupalaym centres. Based on the average over locations the check GA-1 (7.93 q/ha) was the highest yielding entry closely followed by SKNA 501. Based on individual centres, GA-1 was the highest yielder at Bangalore (8.02 q/ha) and Rahuri (8.50 q/ha) and GA-2 at Mettupalayam (7.41 q/ha).

Average plant height of the entries was highest at Mettupalayam (183.36 cm) followed by Bangalore (161.73 cm) and Rahuri (133.21 cm) (Table 40). Based on average over the three locations SKNA 504 had the highest plant height (178.67 cm).

Flowering time showed considerably low variation among the locations as well as among the entries within a location. The mean flowering time was the earliest (46.97 days) at Bangalore and longest (51.19 cm) at Mettupalayam (Table 41). The check variety Annapurna showed early flowering consistently at all the locations. It ranked first (37.83 days) based on the average over all the locations.

Maturity period also showed similar trend as the flowering time. The average maturity period of the entries over all the locations was 93.93 days (Table 42). The earliest flowering entry, Annapurna was earliest in maturity also (83.33 days). The average maturity period was the minimum at Bangalore (91.10 days) while, it was the longest at Mettupalayam (98.34 days).

Test weight (Table 43) expressed in terms of weight of 10 ml seed recorded at three centres showed that it was the highest at Rahuri (7.55 g) followed by at Mettupalayam (7.42 g), and Bangalore (5.70 g) centres. Based on the average over three locations entry, SKMA 501 (7.03 g) showed the highest test weight.

2.2.2 RICE BEAN (*Vigna umbellata*)

2.2.2.1 Initial Varietal Trial and Advanced Varietal Trial-II

The Initial Varietal Trial (one entry) and Advanced Varietal Trial-II (four entries) along with four checks was conducted at 9 locations in the plains. Data have been received from all the locations. Summary performance of these entries has been indicated in table 44.

The average seed yield ranged from 5.45 q/ha at Faizabad to 19.97 q/ha at Ambikapur (Table 45). Significant differences were observed among the entries for seed yield at all the locations. The range of variation was highest at Bangalore (0.07 – 11.81 q/ha) centre. On the basis of average performance over nine locations the entry RBL 50 (11.65 q/ha) was the highest yielder followed by LRB 303 (11.54 q/ha).

Plant height showed extreme variation ranging from 72.98 cm at S.K. Nagar to 142.96 cm at Ambikapur centres (Table 46). Based on the average

performance over the locations the IVT entry BRB-10 had the maximum plant height (123.15 cm) followed by BRB I (118.80 cm) of AVT-II.

The flowering time was the earliest at Mettupalayam (47.81 days) which was closely followed by Bangalore (51.26 days), while it was the longest at S.K. Nagar (87.50 days) centre (Table 47). At other locations early to moderate flowering period was observed. Based on the average over locations RBL 35 (57.84 days) had the earliest flowering followed by LRB 330 (59.73 days).

Maturity period showed wide variation among the locations but very little among the entries. The earliest maturity was observed at Mettupalayam (80.48 days), while it was late at S.K. Nagar (129.08 days) (Table 48). On the basis of average over the locations RBL 35 (101.16 days) and LRB 330 (103.65 days) were earlier in maturity.

Weight of 100 seeds was almost uniform but higher at Ludhiana (6.47 g) followed by Ranchi (6.35 g) and Bangalore (6.28 g) centres (Table 49). The range of variation was maximum at Bangalore (5.13 – 8.83 g) centre. Based on the average over locations BRB 10 (6.18 g) had the boldest seed followed by BRB 1 (6.15 g).

2.2.3 FABA BEAN (*Vicia faba*)

2.2.3.1 Initial Varietal Trial and Advanced Varietal Trial

The Initial Varietal Trial comprising six entries, Advanced Varietal Trial-I comprising three entries and Advanced Varietal Trial-II comprising of one entry was conducted at six locations. Results have been received from all the centres. The summary performance of the entries has been presented in table 50.

Significant differences were observed among the entries for seed yield at all the centres. Mean seed yield levels were relatively low at most of the centres (Table 51). Data from Delhi centre was not included in the overall due to high CV. The average over the locations showed that seed yield was the highest in the entry, HB 416 (16.76 q/ha) followed by HB 418 (15.97 q/ha) among IVT entries and HB405 (15.76 q/ha) and HB430 (15.93 q/ha) among AVT-I entries. AVT-II entry NDF1 yielded 14.39 q/ha as against the check Vikrant (14.59 q/ha).

Plant height was the highest at Delhi (70.52 cm) followed by Ranchi (62.33 cm) centre (Table 52). Moderate plant height was observed at other centres. Based on the average over the locations BSH-42 (63.13 cm) showed the highest plant height.

Flowering time ranged from 50.75 days at Delhi to 73.42 days at Ludhiana centre (Table 53). At Delhi, Ranchi and Ambikapur centres flowering was earlier as compared to that of other centres. Based on the average over the locations ISV 10-2 (60.07 days) was the earliest flowering line followed by HB 420 (60.72 days).

Maturity period varied among the locations with mean maturity period ranging from 125.39 days at Ambikapur to 149.39 days at Ludhiana centre (Table 54). On the basis of overall mean, ISV 10-2 (134.94 days) had the earliest maturity followed by HB418 (135.68 days).

Mean seed weight was the highest at Hisar (29.73 g) and the lowest at Ambikapur (22.96 g) centre (Table 55). Based on the average over the locations HB 418 (27.04 g) had the boldest seed.

Pod yield recorded at three locations showed wide variation between the centres (Table 56). It was the highest at Hisar (158.24 q/ha) and the lowest at Ranchi (31.51 q/ha). Based on the average performance, HB 416 (109.71 q/ha) had the highest pod yield.

2.2.4 WINGED BEAN (*Psophocarpus tetragonolobus*)

2.2.4.1 Initial Varietal Trial

The Initial Varietal Trial consisting of nine entries mainly from Akola and Bangalore centres was conducted at five locations. The summary of performance of the entries has been given in table 57.

Seed yield (Table 58) was the highest at Bhubaneshwar (13.36 q/ha) followed by Ambikapur (10.41 q/ha). The average seed yield over the locations

ranged from 2.51 – 13.36 q/ha. The entry IC 26945 yielded the highest (8.25 q/ha) and the EC 178271 (5.41 q/ha) the lowest.

Average flowering time at five centres ranged between 55.23 and 78.73 days (Table 59). Based on the average over the locations the entry NBR1 Sel flowered earliest (65.90 days) whereas, the entry, EC 178271 took the longest time for flowering (73.50 days).

Maturity period of the entries was recorded at five centres (Table 60). The average maturity period was lowest at Rahuri (154.10 days) and Bangalore (154.17 days), while it was highest at Ambikapur (169.65 days). The entry NBRI Sel matured earliest (157.80 days) among all the entries and was followed by Mysore local (157.87 days) and Dwarf mutant (158.50 days).

100 seed weight recorded at five locations (Table 61) showed that it was the highest at Ambikapur (30.32 g) and lowest at Bangalore (21.56 g). Based on the average over five locations, the entry EC 142665 (30.26 g) showed the highest 100 seeds weight followed by the check AKBW-1 (28.87 g).

Green pod yield (q/ha) (Table 62) of the entries was the highest at Bhubanehswar and very low at Bangalore, but data from Bangalore was not included in over all mean due to high CV. Based on the average performance over the three locations, the entry IC 26945 was highest (45.66 q/ha) whereas, Dwarf mutant was the lowest yielder (26.96 q/ha).

2.2.5 KANKODA (*Momordica dioica*)

Kankoda is an important vegetable crop grown throughout the country. It's green immature fruits are preferred for their delicacy. In Kankoda one Observation Rows Trial was proposed to be conducted.

2.2.5.1 Initial Varietal Trial

The Initial Varietal Trial on ten Kankoda entries was planned at six locations. The results have been received from five centres. The performance of the entries has been presented in table 63.

Fruit yield was the highest at Ambikapur centre (21.34 q/ha) and lowest at Bhubaneswar (3.38 q/ha) centre (Table 64). Fruit yield at other centres was moderate. Based on average RMF 27 (18.85 q/ha) was the highest yielder. For days to fruit setting considerable variation was observed (Table 65) at most of the locations (50.63 – 65.63 days). Earliest fruit setting (50.63 days) was observed at S.K. Nagar centre. Based on average performance, RMF 1 (60.42 days) had earliest fruit setting.

Number of fruits per plant showed wide variation (19.47 – 59.41) among the centres (Table 66). Highest number of fruits was observed at Faizabad followed by Ranchi (54.25) centre. Based on average over locations average fruit number was the highest in RMF 37 (49.55).

Days taken to first picking (Table 67) was lowest at Bhubaneswar (65.20 days) whereas the days taken for last picking (Table 68) was the lowest at Rahuri (77.67 days). No. of pickings recorded at four locations showed that it was highest at Bhubaneswar and lowest at Rahuri (Table 69). Based on average over three locations RMF 27 had highest number of pickings. Individual fruit weight was highest (10.90 g) at Ambikapur centre (Table 70).

2.2.6 TUMBA (*Citrullus colocynthis*)

Tumba is an important crop of the desert region having wide medicinal value. Its seed is used for extracting oil which is used for industrial purposes. In Tumba an Initial Varietal Trial was formulated.

2.2.6.1 Initial Varietal Trial

In the Initial Varietal Trial 10 entries were proposed to be evaluated at two locations. Results have been received from Mandor centre only. The performance attributes of the entries and yield attributes had been given in tables 71 and 72. Seed yield of the entries ranged from 1.54 to 5.44 q/ha, the entry RMT 407 being the highest yielder.

2.2.7 JATROPHA (*Jatropha* spp.)

The trial was planned to be continued at seven locations where the plant is widely adapted.

2.2.7.1 Varietal Trial

The data of the trial with eight entries was received from four centres. The summary of performance of the entries has been given in table 73. The seed yield recorded in eight genotypes at three locations has been presented in table 74. Seed yield was higher at Hisar (5.05 q/ha) centre as compared to that of other centres. The genotype Hans Raj (3.67 q/ha) was the highest yielder based on the average over three locations followed closely by Chhatrapati (3.66 q/ha) and ISJ-1 (3.32 q/ha).

Plant height was very high at Hisar (430.55 cm), moderate at S.K. Nagar (189.52 cm) and Mandor (125.8 cm) and low (100.27 cm) at Bhubaneshwar (Table 75). Hisar J-1 had the highest plant height (229.75 cm) based on the average over locations.

Stem girth recorded at four locations it was highest at Hisar and lowest at Bhubaneshwar (Table 76). Based on the average performance S.K. Nagar (Big) had the highest stem girth (25.67 cm) but it was highest in the entry Hisar J-1 for stem girth based on three locations.

Number of branches per plant (Table 77) was highest at Hisar (13.20) followed by Mandor (13.3) and very low at Bhubaneshwar (4.23). Based on the average over the locations, entry S.K. Nagar (Big) had the highest number of branches (10.26).

100 seed weight (Table 78) recorded at two locations showed that it was the highest at Hisar and lowest at S.K. Nagar. Based on the average over two locations, entry Hisar J-1 showed the highest test weight.

Table 31. Performance of Grain Amaranth entries in Initial Varietal Trial (IVT) and Advance Varietal Trial (AVT) during Rabi 2004-2005 (Plains)

S.No.	Genotypes	Mean maturity duration (days)	Mean seed volume weight (g/50 ml)	Mean yield over locations (q/ha)			Percent increase / decrease over check variety		
				Mean	Location	Annapurna	GA 2	Suvarna	
IVT									
1	IC268367	123.27	16.56	14.94	7	55.94	32.44	47.04	
2	Phule GA 2004	116.01	19.00	13.36	6	39.50	18.48	31.54	
3	PLP 1	135.00	14.27	11.04	8	15.20	-2.17	8.62	
4	PRA 2004-1	123.47	15.86	9.45	8	-1.32	-16.19	-6.95	
5	PRA 2004-2	119.31	15.74	9.32	8	-2.67	-17.34	-8.23	
6	RMA 7	133.52	15.07	13.69	8	42.93	21.39	34.77	
7	RMA 8	136.05	14.85	11.86	8	23.80	5.15	16.74	
8	Shimla-A-3	138.56	23.00	13.44	3	40.33	19.18	32.32	
9	Shimla-A-4	126.33	19.29	12.43	4	29.78	10.22	22.37	
10	Shimla-A-5	123.75	21.09	10.13	4	5.74	-10.19	-0.29	
11	Shimla-A-6	121.56	19.39	9.73	4	1.61	-13.70	-4.19	
12	VL 344	136.79	14.80	10.57	8	10.31	-6.32	4.01	
AVT - I									
13	SKNA 21	133.41	15.45	12.52	8	30.67	10.97	23.21	
14	BGA 2	136.82	14.94	8.22	8	-14.16	-27.10	-19.06	
15	BGA 3	136.00	14.75	7.88	8	-17.78	-30.17	-22.47	
16	MGA 2	134.58	14.92	7.03	8	-26.58	-37.65	-30.77	
17	RMA 3	136.79	15.01	12.54	8	30.85	11.13	23.38	
18	RMA 4	134.96	15.20	12.04	8	25.66	6.73	18.49	
19	IC491998	155.25	6.70	9.07	8	-5.29	-19.56	-10.70	
20	Annapurna (C)	116.47	15.65	9.58	8	0.00	-15.07	-5.71	
21	GA 2 (C)	134.11	15.34	11.28	8	17.75	0.00	11.02	
22	Suvarna (C)	137.36	14.87	10.16	8	6.05	-9.93	0.00	
Trial Mean		130.82	15.20	10.73					

Table 32. Grain yield (q/ha) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Grain Amaranth - Rabi 2004-2005 (Plains)

S.No.	Genotypes	Ambikapur	Ranchi	SK Nagar	Rahuri	Mandor	Hisar	Faizabad	Bhubaneswar	Mean	Rank	Location	Frequency
IVT													
1	IC268367	8.16	10.25	33.82	16.34	12.08	—	13.17	10.76	14.94	1	7	3/7
2	Phule GA 2004	2.57	—	25.66	16.86	11.08	—	13.05	10.96	13.36	4	6	1/6
3	PLP 1	9.55	5.80	24.52	11.86	10.19	3.09	11.70	11.59	11.04	11	8	2/8
4	PRA 2004-1	4.76	12.80	24.08	8.99	3.06	1.85	11.47	8.62	9.45	17	8	1/8
5	PRA 2004-2	4.65	12.55	22.35	8.82	4.21	1.75	12.72	7.55	9.32	18	8	1/8
6	RMA 7	4.10	7.74	30.61	18.01	16.10	7.74	12.75	12.50	13.69	2	8	4/8
7	RMA 8	4.27	7.00	22.15	14.17	14.92	5.49	14.43	12.45	11.86	9	8	3/8
8	Shimla-A-3	—	12.88	23.34	—	—	4.12	—	—	13.44	3	3	1/3
9	Shimla-A-4	—	13.70	25.71	—	—	1.95	—	8.36	12.43	7	4	1/4
10	Shimla-A-5	—	10.08	20.38	—	—	3.91	—	6.15	10.13	14	4	0/4
11	Shimla-A-6	—	11.89	17.03	—	—	3.19	—	6.82	9.73	15	4	0/4
12	VL 344	9.24	7.24	20.40	14.28	6.81	3.29	12.93	10.34	10.57	12	8	2/8
AVT - I													
13	SKNA 21	5.77	12.14	26.23	11.10	14.12	5.60	13.38	11.80	12.52	6	8	2/8
14	BGA 2	2.61	9.26	2.69	12.12	8.19	2.04	12.90	15.99	8.22	20	8	1/8
15	BGA 3	2.78	9.51	5.30	13.75	2.75	2.08	12.98	13.88	7.88	21	8	2/8
16	MGA 2	3.33	6.21	9.88	5.92	6.60	2.76	11.77	9.79	7.03	22	8	0/8
17	RMA 3	4.69	9.14	26.10	10.27	16.87	6.40	14.40	12.42	12.54	5	8	2/8
18	RMA 4	3.82	12.06	22.80	9.25	17.60	4.36	14.10	12.32	12.04	8	8	2/8
19	IC491998	—	—	—	11.67	—	6.48	—	—	9.07	19	2	0/2
20	Annapurna (C)	3.16	10.33	28.72	6.44	5.15	2.06	14.67	6.12	9.58	16	8	
21	GA 2 (C)	5.66	10.29	23.93	11.66	9.85	6.83	11.85	10.16	11.28	10	8	
22	Suvarna (C)	6.91	7.74	17.62	12.03	8.83	4.63	14.25	9.25	10.16	13	8	
	Mean	5.06	9.93	21.59	11.86	9.91	3.98	13.09	10.39	10.73			
	CD (5%)	1.21	1.83	7.04	1.53	2.12	0.78	2.94	1.40				
	CV (%)	14.96	11.51	23.54	9.32	15.46	12.22	14.01	9.73				

Table 33. Plant height (cm) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Grain Amaranth - Rabi 2004-2005 (Plains)

S.No.	Genotypes	Ambikapur	Ranchi	SK Nagar	Rahuri	Mandor	Hisar	Faizabad	Bhubaneswar	Mean	Rank
IVT											
1	IC268367	68.40	91.13	167.00	144.75	98.00	—	96.80	125.10	113.03	9
2	Phule GA 2004	47.93		153.25	141.75	80.60	—	103.02	97.45	104.00	13
3	PLP 1	75.80	104.27	177.50	169.25	99.58	128.83	93.07	146.80	124.39	1
4	PRA 2004-1	37.40	21.63	80.50	84.25	44.60	37.87	104.53	73.85	60.58	20
5	PRA 2004-2	38.40	21.93	81.50	70.75	41.33	55.77	107.47	72.00	61.14	19
6	RMA 7	58.13	70.90	178.25	149.00	75.90	81.07	95.53	116.50	103.16	14
7	RMA 8	72.33	99.07	177.75	151.25	104.50	146.50	98.20	116.00	120.70	2
8	Shimla-A-3	—	19.97	84.25	—	—	91.53	—	—	65.25	18
9	Shimla-A-4	—	18.70	72.50	—	—	50.63	—	70.85	53.17	22
10	Shimla-A-5	—	19.87	73.50	—	—	131.87	—	70.65	73.97	16
11	Shimla-A-6	—	23.60	74.50	—	—	53.73	—	68.95	55.20	21
12	VL 344	67.73	101.53	170.75	156.25	82.10	104.93	99.22	150.25	116.60	4
AVT - I											
13	SKNA 21	67.47	80.13	184.00	109.50	107.00	125.40	97.67	120.95	111.51	10
14	BGA 2	65.43	98.33	133.00	118.00	112.25	97.97	96.27	154.85	109.51	11
15	BGA 3	58.83	94.83	130.50	126.25	106.68	98.93	96.27	156.05	108.54	12
16	MGA 2	70.87	93.53	174.25	141.00	92.75	115.87	96.33	121.25	113.23	7
17	RMA 3	69.67	98.83	182.50	131.25	99.15	109.53	100.08	113.30	113.04	8
18	RMA 4	65.33	77.80	177.50	113.75	86.18	90.40	90.33	113.35	101.83	15
19	IC491998	—	—	—	129.50	—	100.83	—	—	115.17	5
20	Annapurna (C)	28.80	40.63	82.00	116.25	55.75	56.87	108.07	59.75	68.51	17
21	GA 2 (C)	73.87	105.47	192.75	127.50	95.78	105.73	93.60	120.00	114.34	6
22	Suvarna (C)	64.93	103.00	179.75	136.25	95.90	125.53	101.53	149.05	119.49	3
Mean		60.67	69.26	139.40	128.69	86.94	95.49	98.70	110.85	98.75	
CD (5%)		10.59	11.13	10.02	10.99	14.31	27.11	3.63	15.87		
CV (%)		10.91	10.05	5.19	6.16	11.88	17.74	2.30	10.33		

Table 34. Days to flowering in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Grain Amaranth - Rabi 2004-2005 (Plains)

S.No.	Genotypes	Ambikapur	Ranchi	SK Nagar	Rahuri	Mandor	Hisar	Faizabad	Bhubaneswar	Mean	Rank
IVT											
1	IC268367	58.00	82.00	49.50	56.50	44.00	—	79.67	72.00	63.10	10
2	Phule GA 2004	83.33		44.00	54.50	43.00	—	71.67	69.75	61.04	8
3	PLP 1	86.00	91.33	55.50	71.25	59.50	89.00	71.00	75.75	74.92	19
4	PRA 2004-1	54.00	58.00	32.25	58.25	34.25	71.00	73.00	67.00	55.97	3
5	PRA 2004-2	52.67	54.67	33.75	54.50	32.75	68.00	77.00	67.75	55.14	2
6	RMA 7	63.00	77.67	54.00	58.25	41.50	88.00	73.00	69.75	65.65	11
7	RMA 8	92.67	96.33	55.25	60.50	45.00	91.00	79.00	73.25	74.13	18
8	Shimla-A-3	—	57.67	32.75	—	—	82.00	—	—	57.47	4
9	Shimla-A-4	—	55.67	32.50	—	—	84.00	—	62.25	58.60	6
10	Shimla-A-5	—	47.00	35.75	—	—	88.67	—	62.75	58.54	5
11	Shimla-A-6	—	55.33	35.25	—	—	84.00	—	63.25	59.46	7
12	VL 344	90.67	91.33	57.50	72.75	61.50	72.00	81.00	73.25	75.00	20
AVT – I											
13	SKNA 21	85.33	79.00	49.00	55.00	46.50	69.33	71.67	74.25	66.26	12
14	BGA 2	92.00	81.00	82.25	74.75	60.75	68.00	71.33	77.50	75.95	21
15	BGA 3	87.00	94.67	80.25	74.50	60.50	72.00	72.00	75.00	76.99	22
16	MGA 2	66.33	86.67	39.00	46.50	40.25	71.00	78.33	75.25	62.92	9
17	RMA 3	92.67	85.67	49.25	57.75	45.00	85.00	75.33	74.25	70.61	15
18	RMA 4	90.33	86.67	49.25	59.50	43.00	91.00	75.33	72.50	70.95	16
19	IC491998	—	—	—	53.00	—	83.00	—	—	68.00	14
20	Annapurna (C)	52.00	51.67	32.00	55.50	35.00	75.00	74.33	61.00	54.56	1
21	GA 2 (C)	80.00	82.00	48.00	59.50	45.50	82.00	72.00	73.00	67.75	13
22	Suvarna (C)	91.33	93.33	58.50	64.75	58.25	69.00	72.67	75.50	72.92	17
Mean		77.49	75.38	47.88	60.40	46.84	79.15	74.61	70.75		
CD (5%)		3.83	4.93	1.84	3.87	2.80	3.61	2.93	2.25		
CV (%)		3.09	4.08	2.77	4.62	4.32	2.85	2.45	2.29		

Table 35. Days to maturity in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Grain Amaranth - Rabi 2004-2005 (Plains)

S.No.	Genotypes	Ambikapur	Ranchi	SK Nagar	Rahuri	Mandor	Hisar	Faizabad	Bhubaneswar	Mean	Rank	Location	Frequency
IVT													
1	IC268367	134.67	160.00	103.75	105.25	118.25	—	138.00	103.00	123.27	5	7	0/7
2	Phule GA 2004	137.00	—	99.50	105.50	118.25	—	134.33	101.50	116.01	1	6	0/6
3	PLP 1	135.33	167.33	106.75	120.75	120.50	198.33	128.00	103.00	135.00	14	8	1/8
4	PRA 2004-1	123.33	169.67	73.50	99.00	104.00	195.00	131.00	92.25	123.47	6	8	0/8
5	PRA 2004-2	122.67	141.00	76.75	92.75	101.75	194.33	133.00	92.25	119.31	3	8	0/8
6	RMA 7	138.67	160.00	109.00	111.00	117.50	197.67	131.33	103.00	133.52	10	8	0/8
7	RMA 8	142.67	166.67	107.50	106.50	119.75	202.33	140.00	103.00	136.05	16	8	0/8
8	Shimla-A-3	—	145.00	77.00	—	—	193.67	—	—	138.56	21	3	0/3
9	Shimla-A-4	—	143.33	79.50	—	—	191.00	—	91.50	126.33	8	3	1/3
10	Shimla-A-5	—	138.67	74.75	—	—	192.33	—	89.25	123.75	7	3	1/3
11	Shimla-A-6	—	130.67	71.75	—	—	192.33	—	91.50	121.56	4	3	1/3
12	VL 344	138.00	169.67	107.50	120.50	121.00	200.00	134.67	103.00	136.79	17	8	0/8
AVT - I													
13	SKNA 21	134.67	155.33	106.00	107.75	120.25	202.00	138.00	103.25	133.41	9	8	0/8
14	BGA 2	138.00	166.33	112.00	120.50	121.00	201.00	133.00	102.75	136.82	19	8	0/8
15	BGA 3	135.00	165.67	109.00	120.20	121.50	199.67	134.00	103.00	136.00	15	8	0/8
16	MGA 2	136.33	161.00	112.75	106.70	120.50	199.67	136.67	103.00	134.58	12	8	0/8
17	RMA 3	142.00	159.00	111.00	122.20	120.50	198.00	136.33	105.25	136.79	18	8	0/8
18	RMA 4	140.67	157.67	109.00	122.20	117.75	197.67	130.00	104.75	134.96	13	8	0/8
19	IC491998	—	—	—	108.50	—	202.00	—	—	155.25	22	8	0/8
20	Annapurna (C)	120.67	130.67	72.75	89.00	104.00	197.00	130.67	87.00	116.47	2	8	8/8
21	GA 2 (C)	132.33	165.33	98.75	109.70	120.75	205.00	138.00	103.00	134.11	11	8	0/8
22	Suvarna (C)	140.00	170.67	107.75	119.50	122.00	203.33	130.67	105.00	137.36	20	8	0/8
Mean		134.82	156.18	96.49	110.42	117.01	198.12	133.98	99.51	130.82			
CD (5%)		2.94	3.85	3.38	8.30	3.20	4.27	2.33	1.81				
CV (%)		1.36	1.54	2.52	5.42	1.97	1.35	1.09	1.31				

Table 36. Seed volume weight (g/10ml) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Grain Amaranth - Rabi 2005 (Plains)

S.No.	Genotypes	Ambikapur	Ranchi	SK Nagar	Mandor	Hisar	Bhubaneswar	Mean	Rank
IVT									
1	IC268367	6.75	7.00	10.64	7.50	—	8.37	8.05	9
2	Phule GA 2004	6.77	—	10.63	7.75	—	8.35	8.38	7
3	PLP 1	7.30	6.50	10.00	7.40	6.30	8.18	7.61	19
4	PRA 2004-1	8.47	8.92	10.67	7.50	8.50	8.44	8.75	5
5	PRA 2004-2	8.00	8.46	10.90	7.83	7.20	8.45	8.47	6
6	RMA 7	6.80	6.25	10.77	7.50	7.67	8.35	7.89	12
7	RMA 8	7.12	6.53	10.48	7.80	7.00	8.23	7.86	13
8	Shimla-A-3	—	8.41	10.44	—	8.37	—	9.07	1
9	Shimla-A-4	—	8.84	10.45	—	7.70	8.36	8.84	4
10	Shimla-A-5	—	8.36	12.19	—	6.70	8.33	8.90	2
11	Shimla-A-6	—	8.48	10.66	—	7.40	8.37	8.73	3
12	VL 344	6.85	6.40	10.68	7.45	6.57	8.12	7.68	17
AVT – I									
13	SKNA 21	6.78	6.55	11.18	7.80	7.33	8.34	8.00	10
14	BGA 2	6.95	5.90	10.80	7.35	6.63	8.79	7.74	15
15	BGA 3	6.23	4.92	10.95	7.50	6.43	8.66	7.45	21
16	MGA 2	6.90	5.91	10.98	7.23	6.23	8.34	7.60	20
17	RMA 3	6.80	6.06	10.97	7.60	6.50	8.28	7.70	18
18	RMA 4	6.85	6.40	11.07	7.58	6.77	8.31	7.83	14
19	IC491998	—	—	—	—	6.70	—	6.70	22
20	Annapurna (C)	7.73	8.60	10.97	7.85	6.40	8.45	8.33	8
21	GA 2 (C)	6.58	7.26	11.09	7.73	6.57	8.41	7.94	11
22	Suvarna (C)	6.60	6.73	10.73	7.70	6.30	8.21	7.71	16
Mean		7.03	7.12	10.82	7.59	6.96	8.37	7.98	
CD (5%)		0.08	0.52	0.29	0.33	0.56	0.16		
CV (%)		0.75	4.59	1.94	3.15	5.01	1.38		

Table 37. Inflorescence length (cm) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Grain Amaranth - Rabi 2004-2005 (Plains)

S.No.	Genotypes	Mandor	Faizabad	Mean	Rank
IVT					
1	IC268367	50.33	28.20	39.26	3
2	Phule GA 2004	48.10	29.67	38.88	5
3	PLP 1	32.08	27.27	29.67	17
4	PRA 2004-1	33.75	28.93	31.34	14
5	PRA 2004-2	30.25	34.33	32.29	12
6	RMA 7	42.95	32.67	37.81	7
7	RMA 8	50.83	26.33	38.58	6
8	Shimla-A-3	—	—	—	—
9	Shimla-A-4	—	—	—	—
10	Shimla-A-5	—	—	—	—
11	Shimla-A-6	—	—	—	—
12	VL 344	29.28	34.67	31.97	13
AVT - I					
13	SKNA 21	50.00	33.80	41.90	1
14	BGA 2	36.53	30.47	33.50	10
15	BGA 3	37.08	29.40	33.24	11
16	MGA 2	44.18	30.20	37.19	9
17	RMA 3	49.85	31.40	40.63	2
18	RMA 4	46.75	28.87	37.81	8
19	IC491998	—	—	—	—
20	Annapurna (C)	35.08	28.80	31.94	15
21	GA 2 (C)	45.50	32.47	38.98	4
22	Suvarna (C)	31.18	28.20	29.69	16
Mean		40.80	30.33	35.57	
CD (5%)		7.76	3.04		
CV (%)		13.72	6.26		

Table 38. Performance of Grain Amaranth entries in Initial Varietal Trial (IVT) during - kharif 2005 (Plains)

S.No.	Genotypes	Mean maturity duration (days)	Mean volume weight (g/10 ml)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety			
				Mean	Location	Annapurna	GA-1	GA-2	Suvarna
1	BGA-5	92.00	6.75	6.96	3	74.05	-12.21	4.69	10.68
2	IC268367	104.33	7.70	7.12	1	77.92	-10.26	7.02	13.14
3	IGAS 1	106.33	7.10	5.42	1	35.58	-31.61	-18.45	-13.78
4	RMA9	97.00	6.82	6.80	3	70.03	-14.23	2.28	8.13
5	SKNA 501	93.44	7.03	7.46	3	86.55	-5.90	12.21	18.63
6	SKNA 502	92.78	6.90	7.29	3	82.15	-8.12	9.56	15.83
7	SKNA 503	90.78	7.02	7.16	3	79.08	-9.67	7.72	13.88
8	SKNA 504	95.00	6.90	6.20	3	54.95	-21.84	-6.80	-1.46
9	Annapurna (C)	83.33	6.47	4.00	2	0.00	-49.56	-39.85	-36.41
10	GA-1 (C)	98.33	6.89	7.93	3	98.25	0.00	19.25	26.07
11	GA-2 (C)	98.56	6.80	6.65	3	66.25	-16.14	0.00	5.72
12	Suvarna (C)	89.50	6.65	6.29	2	57.25	-20.68	-5.41	0.00
Trial Mean		93.93	6.89	6.88					

Table 39. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Grain Amaranth – kharif 2005 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Rahuri	Mean	Rank	Location	Frequency
1	BGA-5	4.94	6.55	9.40	6.96	6	3	0/3
2	IC268367	—	7.12	—	7.12	5	1	0/1
3	IGAS 1	—	5.42	—	5.42	11	1	0/1
4	RMA9	5.40	6.19	8.81	6.80	7	3	0/3
5	SKNA 501	7.25	6.22	8.92	7.46	2	3	0/3
6	SKNA 502	7.56	5.93	8.37	7.29	3	3	0/3
7	SKNA 503	6.79	6.33	8.37	7.16	4	3	0/3
8	SKNA 504	6.48	6.01	6.10	6.20	10	3	0/3
9	Annapurna (C)	3.49	4.51		4.00	12	2	0/2
10	GA-1 (C)	8.02	7.27	8.50	7.93	1	3	2/3
11	GA-2 (C)	4.78	7.41	7.75	6.65	9	3	1/3
12	Suvarna (C)	5.25	7.34		6.29	8	2	0/2
	Mean	6.00	6.36	8.28	6.88			
	CD (5%)	1.33	0.35	1.03				
	CV(%)	12.97	3.22	7.07				

Table 40. Plant height (cm) in Initial Varietal Trial (IVT) on Grain Amaranth - kharif 2005 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Rahuri	Mean	Rank
1	BGA-5	170.00	192.00	127.00	163.00	7
2	IC268367	—	177.00	—	177.00	4
3	IGAS 1	—	177.00	—	177.00	3
4	RMA9	180.00	214.00	130.33	174.78	5
5	SKNA 501	162.67	160.67	113.33	145.56	11
6	SKNA 502	154.00	173.00	141.00	156.00	10
7	SKNA 503	162.67	195.33	128.00	162.00	8
8	SKNA 504	186.67	198.00	151.33	178.67	1
9	Annapurna (C)	105.00	165.33	—	135.17	12
10	GA-1 (C)	176.67	180.00	139.33	165.33	6
11	GA-2 (C)	158.00	175.33	135.33	156.22	9
12	Suvarna (C)	161.67	192.67	—	177.17	2
	Mean	161.73	183.36	133.21	159.43	
	CD (5%)	27.95	29.60	7.81		
	CV(%)	10.08	9.55	3.34		

Table 41. Days to flowering in Initial Varietal Trial (IVT) on Grain Amaranth - kharif 2005 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Rahuri	Mean	Rank
1	BGA-5	46.67	45.67	51.00	47.78	5
2	IC268367	—	46.33	—	46.33	3
3	IGAS 1	—	54.67	—	54.67	12
4	RMA9	50.33	55.33	50.67	52.11	8
5	SKNA 501	45.67	52.00	45.00	47.56	4
6	SKNA 502	46.00	55.33	46.33	49.22	6
7	SKNA 503	46.00	51.67	52.00	49.89	7
8	SKNA 504	51.33	54.00	51.00	52.11	9
9	Annapurna (C)	34.33	41.33	—	37.83	1
10	GA-1 (C)	52.67	55.33	52.67	53.56	11
11	GA-2 (C)	50.67	56.33	49.67	52.22	10
12	Suvarna (C)	46.00	46.33	—	46.17	2
	Mean	46.97	51.19	49.79	49.32	
	CD (5%)	0.85	0.87	1.97		
	CV(%)	1.05	1.00	2.25		

Table 42. Days to maturity in Initial Varietal Trial (IVT) on Grain Amaranth - kharif 2005 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Rahuri	Mean	Rank	Location	Frequency
1	BGA-5	90.67	91.33	94.00	92.00	4	3	1/3
2	IC268367	—	104.33	—	104.33	11	1	0/1
3	IGAS 1	—	106.33	—	106.33	12	1	0/1
4	RMA9	93.33	105.00	92.67	97.00	8	3	1/3
5	SKNA 501	95.00	94.67	90.67	93.44	6	3	1/3
6	SKNA 502	91.33	97.00	90.00	92.78	5	3	1/3
7	SKNA 503	89.33	95.00	88.00	90.78	3	3	1/3
8	SKNA 504	97.67	97.67	89.67	95.00	7	3	1/3
9	Annapurna (C)	79.67	87.00	—	83.33	1	2	2/2
10	GA-1 (C)	92.67	106.00	96.33	98.33	9	3	1/3
11	GA-2 (C)	91.67	107.00	97.00	98.56	10	3	0/3
12	Suvarna (C)	89.67	89.33	—	89.50	2	2	0/2
	Mean	91.10	98.39	92.29	93.93			
	CD (5%)	3.46	2.49	1.33				
	CV(%)	2.22	1.50	0.82				

Table 43. Seed volume weight (g/10 ml) in Initial Varietal Trial (IVT) on Grain Amaranth - kharif 2005 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Rahuri	Mean	Rank
1	BGA-5	5.30	7.40	7.54	6.75	10
2	IC268367	—	7.70	—	7.70	1
3	IGAS 1	—	7.10	—	7.10	2
4	RMA9	5.63	7.30	7.54	6.82	8
5	SKNA 501	5.97	7.57	7.54	7.03	3
6	SKNA 502	5.63	7.53	7.54	6.90	6
7	SKNA 503	6.07	7.47	7.54	7.02	4
8	SKNA 504	5.53	7.60	7.58	6.90	5
9	Annapurna (C)	6.17	6.77	—	6.47	12
10	GA-1 (C)	5.73	7.40	7.54	6.89	7
11	GA-2 (C)	5.40	7.43	7.56	6.80	9
12	Suvarna (C)	5.57	7.73	—	6.65	11
	Mean	5.70	7.42	7.55	6.89	
	CD (5%)	0.61	0.16	0.06		
	CV(%)	6.26	1.31	0.44		

Table 44. Performance of Rice bean entries in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) during 2005 (Plains)

S.No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety			
				Mean	Location	RBL 1	RBL 6	RBL 35	RBL 50
IVT									
1	BRB 10	120.43	6.18	8.85	7	-21.77	-19.49	-23.19	-24.05
AVT - II									
2	BRB 1	111.28	6.15	9.67	7	-14.48	-11.99	-16.04	-16.98
3	BRB 2	113.01	6.04	9.36	9	-17.20	-14.79	-18.71	-19.62
4	LRB 303	105.98	5.84	11.54	9	2.03	5.00	0.17	-0.95
5	LRB 330	103.65	5.89	10.77	9	-4.79	-2.02	-6.53	-7.57
6	RBL1 (C)	105.83	5.77	11.31	9	0.00	2.91	-1.82	-2.92
7	RBL6 (C)	105.05	5.90	10.99	9	-2.83	0.00	-4.60	-5.67
8	RBL35 (C)	101.16	5.90	11.52	9	1.86	4.82	0.00	-1.12
9	RBL50 (C)	106.18	5.68	11.65	9	3.01	6.01	1.13	0.00
Trial Mean		108.27	5.94	10.81					

Table 45. Grain yield (q/ha) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Rice bean: 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	Mean	Rank	Location	Frequency
IVT														
1	BRB 10	19.51	0.07	11.85	3.79	—	—	10.45	7.22	9.06	8.85	9	7	1 /7
AVT - II														
2	BRB 1	22.69	0.07	9.12	4.84	—	—	13.19	7.03	10.77	9.67	7	7	1/7
3	BRB 2	17.84	0.09	11.98	6.77	11.57	6.19	12.94	7.17	9.74	9.36	8	9	2/9
4	LRB 303	18.59	11.34	9.25	5.19	15.42	15.67	10.70	8.70	9.00	11.54	2	9	1/9
5	LRB 330	16.26	10.65	9.64	5.39	13.66	11.47	10.81	7.59	11.45	10.77	6	9	0/9
6	RBL1 (C)	19.27	10.42	8.98	5.64	14.12	13.34	11.66	8.28	10.10	11.31	4	9	1/9
7	RBL6 (C)	21.26	11.11	9.11	5.00	10.46	13.45	10.59	8.14	9.82	10.99	5	9	1/9
8	RBL35 (C)	22.13	10.88	8.73	6.88	13.43	13.48	9.83	8.51	9.87	11.52	3	9	3/9
9	RBL50 (C)	22.17	11.81	8.86	5.56	15.28	11.88	10.18	8.00	11.15	11.65	1	9	4/9
	Mean	19.97	7.38	9.72	5.45	13.42	12.21	11.15	7.85	10.11	10.81			
	CD (5%)	3.63	1.72	1.75	0.89	2.51	2.60	1.28	1.20	0.71				
	CV (%)	12.48	13.48	12.34	11.15	10.52	14.34	6.65	8.86	4.06				

Table 46. Plant height (cm) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Rice bean: 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	SK Nagar	Mean	Rank
IVT													
1	BRB 10	162.45	173.67	91.98	126.82	—	—	90.67	141.00	131.77	66.84	123.15	1
AVT - II													
2	BRB 1	142.10	162.67	93.85	130.85	—	—	70.33	146.33	135.40	68.86	118.80	2
3	BRB 2	158.30	162.33	96.35	133.70	135.30	62.50	75.33	147.67	110.20	83.72	116.54	3
4	LRB 303	122.50	59.67	76.95	123.02	139.07	103.00	72.00	134.00	124.77	71.30	102.63	4
5	LRB 330	136.60	49.33	69.30	120.85	136.30	91.50	74.33	132.00	122.00	72.44	100.47	9
6	RBL1 (C)	138.35	54.67	76.80	120.57	129.73	105.00	68.33	135.33	114.07	76.09	101.89	6
7	RBL6 (C)	150.65	59.00	79.45	133.22	119.40	105.25	63.67	130.00	108.30	71.20	102.01	5
8	RBL35 (C)	135.40	56.00	79.30	131.10	113.87	100.00	78.67	134.67	115.13	70.62	101.47	8
9	RBL50 (C)	140.25	49.00	75.30	130.07	118.07	101.50	70.67	133.00	124.87	75.77	101.85	7
	Mean	142.96	91.81	82.14	127.80	127.39	95.54	73.78	137.11	120.72	72.98	107.22	
	CD (5%)	30.57	18.19	11.68	2.93	18.40	16.90	1.79	8.06	7.66	3.26		
	CV (%)	14.68	11.44	9.76	1.57	8.11	11.91	1.40	3.40	3.67	3.06		

Table 47. Days to flowering in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Rice bean: 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	SK Nagar	Mean	Rank
IVT													
1	BRB 10	94.25	79.00	70.50	80.50	—	95.00	54.67	53.67	98.00	99.50	80.56	9
AVT - II													
2	BRB 1	59.50	79.00	71.25	80.50	—	95.00	54.33	54.00	71.67	80.75	71.78	8
3	BRB 2	61.75	47.00	60.50	81.00	70.67	62.50	44.00	57.00	68.00	86.75	63.92	7
4	LRB 303	62.50	43.67	51.75	80.00	72.33	59.50	46.67	50.33	49.00	85.75	60.15	3
5	LRB 330	64.00	42.00	54.00	78.75	70.33	63.25	47.33	49.33	46.33	82.00	59.73	2
6	RBL1 (C)	70.00	43.67	53.50	78.00	68.00	65.00	48.00	52.67	55.33	90.50	62.47	4
7	RBL6 (C)	70.50	42.67	55.00	81.00	67.67	65.25	45.67	54.00	60.33	90.25	63.23	5
8	RBL35 (C)	58.50	42.00	54.00	82.75	68.00	59.00	43.00	49.67	40.00	81.50	57.84	1
9	RBL50 (C)	72.25	42.33	53.50	79.50	67.67	67.00	46.67	51.67	61.33	90.50	63.24	6
	Mean	68.14	51.26	58.22	80.22	69.24	70.17	47.81	52.48	61.11	87.50	64.62	
	CD (5%)	2.75	1.35	2.50	2.38	5.84	1.17	2.44	1.93	3.98	1.07		
	CV (%)	2.77	1.52	2.95	2.04	4.74	1.14	2.94	2.13	3.76	0.84		

Table 48. Days to maturity in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Rice bean: 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	SK Nagar	Mean	Rank	Location	Frequency
IVT															
1	BRB 10	132.50	111.00	105.50	127.00	—	—	95.00	98.00	152.67	141.75	120.43	9	8	0/8
AVT - II															
2	BRB 1	105.50	114.33	106.00	128.50	—	—	75.67	96.33	139.67	124.25	111.28	7	8	0/8
3	BRB 2	110.25	112.00	94.50	128.50	132.00	122.00	75.33	97.00	133.00	125.50	113.01	8	10	0/10
4	LRB 303	109.00	72.67	86.50	125.00	128.33	109.25	94.00	87.00	117.33	130.75	105.98	5	10	1/10
5	LRB 330	106.50	73.67	89.75	124.75	125.67	114.00	74.33	85.00	120.33	122.50	103.65	2	10	0/10
6	RBL1 (C)	108.25	73.33	92.00	125.25	123.00	120.00	77.67	87.00	121.33	130.50	105.83	4	10	1/10
7	RBL6 (C)	108.75	70.33	89.00	127.00	124.67	120.00	78.00	87.00	117.00	128.75	105.05	3	10	1/10
8	RBL35 (C)	105.00	68.67	89.50	126.75	112.67	111.75	76.33	88.00	105.67	127.25	101.16	1	10	7/10
9	RBL50 (C)	110.50	71.00	89.50	131.50	121.33	122.50	78.00	84.67	122.33	130.50	106.18	6	10	1/10
	Mean	110.69	85.22	93.58	127.14	123.95	117.07	80.48	90.00	125.48	129.08	108.27			
	CD (5%)	2.55	1.35	2.59	2.59	5.46	1.60	1.25	2.09	2.74	5.75				
	CV (%)	1.58	0.92	1.90	1.40	2.48	0.92	0.90	1.34	1.26	3.06				

Table 49. 100 seed weight (g) in Initial Varietal Trial (IVT) and Advanced Varietal Trial (AVT) on Rice bean: 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Faizabad	Ludhiana	Mettupalayam	Rahuri	Ranchi	Mean	Rank
IVT										
1	BRB 10	5.58	8.83	5.41	—	5.83	5.60	5.85	6.18	1
AVT - II										
2	BRB-1	5.34	7.67	5.55	—	6.47	5.40	6.49	6.15	2
3	BRB 2	5.39	8.17	5.23	5.95	5.33	5.47	6.75	6.04	3
4	LRB 303	6.04	5.27	4.95	6.28	6.00	5.37	7.02	5.84	7
5	LRB 330	6.18	5.30	5.21	6.70	6.30	5.57	5.95	5.89	6
6	RBL1 (C)	5.73	5.20	5.02	6.45	6.20	5.60	6.20	5.77	8
7	RBL6 (C)	5.71	5.63	5.40	6.68	6.20	5.37	6.33	5.90	4
8	RBL35 (C)	5.79	5.33	5.51	6.43	6.40	5.40	6.45	5.90	5
9	RBL50 (C)	5.28	5.13	5.30	6.80	5.60	5.53	6.11	5.68	9
	Mean	5.67	6.28	5.29	6.47	6.04	5.48	6.35	5.94	
	CD (5%)	0.65	1.89	0.27	0.77	0.14	0.32	0.39		
	CV (%)	7.84	17.36	3.46	8.02	1.38	3.39	3.52		

Table 50. Performance of Faba bean entries in Initial Varietal Trial (IVT) during 2005 (Plains)

S.No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety
				Mean	Location	
IVT						
1	BSH 42	139.57	26.45	15.15	5	3.87
2	HB 202	136.49	25.49	13.74	5	-5.81
3	HB 303	137.10	25.86	14.65	5	0.41
4	HB 416	136.18	25.40	16.76	5	14.88
5	HB 418	135.68	27.04	15.97	5	9.49
6	ISV 10-2	134.94	24.58	12.31	5	-15.60
AVT - I						
7	HB 405	137.22	26.06	15.76	5	7.99
8	HB 420	139.01	25.15	13.99	5	-4.12
9	HB 430	137.99	25.16	15.93	5	9.21
AVT - II						
10	NDF 1	138.60	26.14	14.39	5	-1.36
11	Vikrant (C)	136.74	24.93	14.59	5	0.00
Trial Mean		137.23	25.66	14.84		

Table 51. Seed yield (q/ha) in Initial Varietal Trial (IVT) on Faba bean : 2005 (Plains)

S.No.	Genotypes	Delhi*	Ambikapur	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank	Location	Frequency
IVT											
1	BSH 42	9.55	8.19	8.62	33.67	13.33	11.95	15.15	5	5	2/5
2	HB 202	17.99	6.71	7.48	33.21	11.04	10.27	13.74	10	5	1/5
3	HB 303	32.93	8.33	8.15	35.08	11.77	9.92	14.65	6	5	1/5
4	HB 416	30.93	8.10	6.75	44.48	12.78	11.69	16.76	1	5	1/5
5	HB 418	20.88	8.66	8.55	42.92	9.31	10.44	15.97	2	5	2/5
6	ISV 10-2	10.40	6.71	8.14	28.39	10.42	7.91	12.31	11	5	0/5
AVT - I											
7	HB 405	20.11	8.70	8.16	40.77	10.59	10.55	15.76	4	5	1/5
8	HB 420	26.29	7.41	8.79	30.58	13.61	9.55	13.99	9	5	1/5
9	HB 430	6.40	11.02	8.29	34.28	14.97	11.12	15.93	3	5	3/5
AVT - II											
10	NDF 1	10.21	8.24	9.21	28.55	16.01	9.95	14.39	8	5	1/5
11	Vikrant (C)	33.33	8.10	7.17	29.55	15.87	12.27	14.59	7	5	0/5
Mean		19.91	8.20	8.12	34.68	12.70	10.51	14.84			
CD (5%)		18.44	2.74	1.03	2.03	2.62	1.51				
CV (%)		54.28	19.62	7.42	3.43	12.07	10.39				

* Data from Delhi not included in the mean due to high C.V.

Table 52. Plant height (cm) in Initial Varietal Trial (IVT) on Faba bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Delhi	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank
IVT									
1	BSH 42	52.13	70.10	52.20	87.20	56.00	61.18	63.13	1
2	HB 202	50.60	68.55	54.10	56.07	58.00	59.15	57.74	10
3	HB 303	53.07	57.60	54.20	58.87	55.00	66.25	57.50	11
4	HB 416	47.53	77.20	51.20	63.07	57.67	60.43	59.52	5
5	HB 418	50.67	75.45	55.80	54.53	51.00	61.10	58.09	9
6	ISV 10-2	46.60	75.85	55.80	66.93	54.67	52.20	58.68	7
AVT - I									
7	HB 405	50.73	79.80	54.70	56.83	58.00	54.80	59.14	6
8	HB 420	52.73	66.35	57.20	53.83	60.67	75.85	61.11	3
9	HB 430	51.33	60.00	58.50	53.30	56.33	70.15	58.27	8
AVT - II									
10	NDF 1	54.67	68.15	53.80	53.87	68.67	69.50	61.44	2
11	Vikrant (C)	54.53	76.65	58.30	56.87	65.33	55.00	61.11	4
	Mean	51.33	70.52	55.07	60.12	58.30	62.33	59.61	
	CD (5%)	10.22	19.82	1.59	16.22	12.95	15.45		
	CV (%)	11.67	19.48	1.69	15.81	13.02	17.88		

Table 53. Days to flowering in Initial Varietal Trial (IVT) on Faba bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Delhi	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank
IVT									
1	BSH 42	60.67	53.75	63.00	72.00	74.67	61.00	64.18	11
2	HB 202	57.67	53.25	62.00	65.67	75.00	58.00	61.93	5
3	HB 303	62.00	54.25	61.00	65.00	75.67	58.50	62.74	7
4	HB 416	59.00	47.75	65.00	65.67	72.67	61.75	61.97	6
5	HB 418	61.67	49.25	66.00	64.33	73.67	63.00	62.99	9
6	ISV 10-2	56.67	51.50	62.00	65.00	68.00	57.25	60.07	1
AVT – I									
7	HB 405	62.00	48.75	65.00	67.00	74.67	59.75	62.86	8
8	HB 420	59.00	50.75	63.00	64.33	73.00	54.25	60.72	2
9	HB 430	61.00	48.75	61.00	65.00	71.67	59.50	61.15	4
AVT – II									
10	NDF 1	62.33	52.50	66.00	66.00	74.67	56.50	63.00	10
11	Vikrant (C)	58.33	47.75	61.00	63.33	74.00	60.00	60.74	3
	Mean	60.03	50.75	63.18	65.76	73.42	59.05	62.03	
	CD (5%)	3.52	5.03	1.79	5.42	2.10	3.66		
	CV (%)	3.43	6.87	1.66	4.83	1.67	4.47		

Table 54. Days to maturity in Initial Varietal Trial (IVT) on Faba bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Delhi	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank	Location	Frequency
IVT											
1	BSH 42	128.00	143.75	138.00	143.00	149.67	135.00	139.57	11	6	0/6
2	HB 202	123.67	137.75	135.00	139.00	149.00	134.50	136.49	4	6	0/6
3	HB 303	128.33	139.75	133.00	138.67	149.33	133.50	137.10	6	6	0/6
4	HB 416	123.00	143.25	131.00	140.33	149.00	130.50	136.18	3	6	1/6
5	HB 418	128.33	140.25	129.00	140.00	149.00	127.50	135.68	2	6	2/6
6	ISV 10-2	120.67	138.50	131.00	141.67	149.33	128.50	134.94	1	6	1/6
AVT – I											
7	HB 405	128.00	140.50	130.00	137.67	149.67	137.50	137.22	7	6	1/6
8	HB 420	124.33	142.75	138.00	141.00	150.00	138.00	139.01	10	6	0/6
9	HB 430	124.00	139.75	140.00	138.00	148.67	137.50	137.99	8	6	0/6
AVT – II											
10	NDF 1	129.00	139.25	136.00	139.33	150.00	138.00	138.60	9	6	0/6
11	Vikrant (C)	122.00	141.00	133.00	140.00	149.67	134.75	136.74	5	6	0/6
Mean		125.39	140.59	134.00	139.88	149.39	134.11	137.23			
CD (5%)		2.74	5.35	2.65	6.34	1.24	2.37				
CV (%)		1.28	2.64	1.16	2.65	0.48	1.28				

Table 55. 100 seed weight (g) in Initial Varietal Trial (IVT) on Faba bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Delhi	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank
IVT									
1	BSH 42	23.95	24.61	26.25	30.50	25.10	28.28	26.45	2
2	HB 202	22.13	22.42	25.08	32.10	23.93	27.25	25.49	6
3	HB 303	25.02	24.79	24.67	27.50	24.87	28.32	25.86	5
4	HB 416	22.47	23.59	22.63	32.80	24.57	26.35	25.40	7
5	HB 418	28.18	25.41	24.41	32.40	24.47	27.38	27.04	1
6	ISV 10-2	23.03	23.90	24.23	27.60	25.13	23.62	24.58	11
AVT – I									
7	HB 405	21.82	27.09	23.41	28.90	27.40	27.73	26.06	4
8	HB 420	21.18	23.81	23.91	29.60	25.17	27.20	25.15	9
9	HB 430	18.07	23.70	25.41	31.43	25.03	27.30	25.16	8
AVT – II									
10	NDF 1	23.48	24.01	27.58	28.33	24.33	29.13	26.14	3
11	Vikrant (C)	23.20	26.07	23.73	25.90	24.53	26.16	24.93	10
	Mean	22.96	24.49	24.66	29.73	24.96	27.15	25.66	
	CD (5%)	0.37	4.56	0.77	0.82	2.09	2.25		
	CV (%)	0.95	12.91	1.82	1.61	4.91	5.97		

Table 56. Pod yield (q/ha) in Initial Varietal Trial (IVT) on Faba bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Hisar	Ranchi	Mean	Rank
IVT						
1	BSH 42	74.58	152.00	42.89	89.82	7
2	HB 202	69.58	160.00	29.82	86.47	5
3	HB 303	54.51	165.00	37.00	85.50	6
4	HB 416	102.43	190.00	36.69	109.71	1
5	HB 418	73.05	175.00	31.84	93.30	3
6	ISV 10-2	29.17	135.00	24.29	62.82	11
AVT - I						
7	HB 405	77.43	172.00	26.83	92.09	4
8	HB 420	80.21	145.00	23.85	83.02	9
9	HB 430	84.86	162.00	29.75	92.20	2
AVT - II						
10	NDF 1	61.95	143.00	26.28	77.07	10
11	Vikrant (C)	81.46	141.67	37.36	86.83	8
	Mean	71.75	158.24	31.51	87.17	
	CD (5%)	18.12	4.41	4.88		
	CV (%)	14.80	1.63	11.17		

Table 57. Performance of Winged bean entries in Initial Varietal Trial (IVT) during 2005 (Plains)

S.No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety
				Mean	Location	
1	Dwarf Mutant	158.50	27.75	6.63	5	9.19
2	EC142665	163.93	30.26	7.83	5	29.06
3	EC178271	162.17	25.63	5.41	5	-10.93
4	EC178313	162.00	28.63	7.92	5	30.43
5	EC178331	161.47	28.23	6.82	5	12.36
6	EC038955	160.70	26.52	6.26	5	3.18
7	IC026945	159.40	28.04	8.25	5	35.98
8	Mysore Local	157.87	26.15	6.71	5	10.61
9	NBRI Sel.	157.80	25.92	6.22	5	2.46
10	AKBW 1 (C)	163.87	28.87	6.07	5	-
Trial Mean		160.77	27.60	6.81		

Table 58. Seed yield (q/ha) in Initial Varietal Trial (IVT) on Winged bean : 2005 (Plains)

S.No.	Genotypes	Bhubaneswar	Ambikapur	Rahuri	Ranchi	Bangalore	Mean	Rank	Location	Frequency
1	Dwarf Mutant	9.65	13.53	5.96	1.21	2.78	6.63	6	5	1/5
2	EC142665	20.56	6.31	8.42	1.98	1.91	7.83	3	5	3/5
3	EC178271	11.60	8.36	4.16	1.70	1.22	5.41	10	5	2/5
4	EC178313	17.78	11.86	6.62	1.42	1.91	7.92	2	5	2/5
5	EC178331	15.21	6.75	7.59	1.83	2.73	6.82	4	5	2/5
6	EC038955	11.67	8.67	7.17	1.33	2.48	6.26	7	5	2/5
7	IC026945	16.73	13.73	6.38	1.23	3.19	8.25	1	5	2/5
8	Mysore Local	10.28	12.70	5.69	1.70	3.21	6.71	5	5	2/5
9	NBRI Sel.	11.11	9.42	6.01	1.74	2.81	6.22	8	5	2/5
10	AKBW 1 (C)	9.03	12.78	4.21	1.42	2.90	6.07	9	5	0/5
	Mean	13.36	10.41	6.22	1.56	2.51	6.81			
	CD (5%)	1.87	3.04	1.45	0.19	0.74				
	CV (%)	8.18	12.94	13.58	6.95	17.12				

Table 59. Days to flowering in Initial Varietal Trial (IVT) on Winged bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Rahuri	Ranchi	Mean	Rank
1	Dwarf Mutant	74.25	69.00	65.00	53.33	76.00	67.52	5
2	EC142665	75.50	59.00	75.00	58.00	67.67	67.03	7
3	EC178271	95.50	62.67	73.00	56.67	79.67	73.50	10
4	EC178313	76.00	65.00	72.00	56.67	76.33	69.20	8
5	EC178331	78.50	65.00	71.33	53.33	71.33	67.90	6
6	EC038955	74.75	66.00	68.00	53.67	69.33	66.35	3
7	IC026945	74.50	68.00	60.33	57.00	71.67	66.30	5
8	Mysore Local	88.75	68.00	69.67	58.00	78.33	72.55	9
9	NBRI Sel.	73.50	65.00	68.67	52.33	70.00	65.90	1
10	AKBW 1 (C)	76.00	64.00	69.00	53.33	78.00	68.07	7
	Mean	78.73	65.17	69.20	55.23	73.83	68.43	
	CD (5%)	4.34	1.10	3.49	2.30	3.63		
	CV (%)	3.80	0.98	2.94	2.43	2.87		

Table 60. Days to maturity in Initial Varietal Trial (IVT) on Winged bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Rahuri	Ranchi	Mean	Rank	Location	Frequency
1	Dwarf Mutant	170.50	154.67	158.00	153.67	155.67	158.50	3	5	3/5
2	EC142665	175.00	150.67	174.33	151.67	168.00	163.93	10	5	1/5
3	EC178271	175.50	151.67	170.67	152.67	160.33	162.17	8	5	1/5
4	EC178313	172.00	155.33	170.67	152.67	159.33	162.00	7	5	1/5
5	EC178331	167.00	157.67	173.00	153.00	156.67	161.47	6	5	2/5
6	EC038955	170.50	152.33	171.00	153.00	156.67	160.70	5	5	2/5
7	IC026945	160.00	155.33	165.00	156.33	160.33	159.40	4	5	2/5
8	Mysore Local	158.00	157.33	159.67	155.33	159.00	157.87	2	5	3/5
9	NBRI Sel.	176.00	151.33	160.33	143.00	158.33	157.80	1	5	1/5
10	AKBW 1 (C)	172.00	155.33	163.33	169.67	159.00	163.87	9	5	0/5
	Mean	169.65	154.17	166.60	154.10	159.33	160.77			
	CD (5%)	5.08	1.25	3.37	5.52	2.05				
	CV (%)	1.32	0.47	1.18	2.09	0.75				

Table 61. 100 seed weight (g) in Initial Varietal Trial (IVT) on Winged bean : 2005 (Plains)

S.No.	Genotypes	Bhubaneswar	Ambikapur	Rahuri	Ranchi	Bangalore	Mean	Rank
1	Dwarf Mutant	28.09	33.80	29.73	26.27	20.87	27.75	6
2	EC142665	32.49	33.95	28.77	31.10	25.00	30.26	1
3	EC178271	29.14	25.43	28.37	25.90	19.30	25.63	10
4	EC178313	30.63	28.40	29.37	31.90	22.87	28.63	3
5	EC178331	29.54	31.43	29.03	30.13	21.00	28.23	4
6	EC038955	27.76	25.95	27.67	29.17	22.07	26.52	7
7	IC026945	30.79	27.03	29.00	31.50	21.87	28.04	5
8	Mysore Local	27.49	33.10	28.37	21.77	20.03	26.15	8
9	NBRI Sel.	25.42	29.30	28.43	26.73	19.70	25.92	9
10	AKBW 1 (C)	28.67	34.83	29.17	28.83	22.87	28.87	2
	Mean	29.00	30.32	28.79	28.33	21.56	27.60	
	CD (5%)	0.87	5.82	1.24	8.51	3.35		
	CV (%)	1.75	8.49	2.51	17.53	9.05		

Table 62. Green pods yield (q/ha) in Initial Varietal Trial (IVT) on Winged bean : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Rahuri	Bangalore*	Bhubaneswar	Mean	Rank
1	Dwarf Mutant	16.03	37.08	3.26	27.78	26.96	10
2	EC142665	26.94	37.26	2.83	64.24	42.81	3
3	EC178271	19.14	25.80	4.59	38.19	27.71	9
4	EC178313	40.19	33.51	3.01	60.76	44.82	2
5	EC178331	25.69	34.69	3.27	46.18	35.52	4
6	EC038955	26.06	26.56	2.37	35.76	29.46	8
7	IC026945	42.39	34.86	4.11	59.72	45.66	1
8	Mysore Local	26.44	32.40	4.56	32.98	30.61	6
9	NBRI Sel.	37.53	28.47	4.77	32.15	32.72	5
10	AKBW 1 (C)	20.00	36.28	4.42	32.64	29.64	7
	Mean	28.04	32.69	3.72	43.04	34.59	
	CD (5%)	15.57	4.81	2.79	4.33		
	CV (%)	24.56	8.58	43.80	5.87		

* Data from Bangalore not included in the mean due to high C.V.

Table 63. Performance of Kankoda entries in Initial Varietal Trial (IVT) during 2005 (Plains)

S.No.	Genotypes	Mean fruit setting (days)	Mean yield over location (q/ha)		Percent increase / decrease over trial mean
			Mean	Location	
1	NDM 1	67.50	13.53	2	-12.69
2	Phule MD 05-1	62.83	14.70	4	-5.19
3	Phule MD 05-2	60.67	14.50	3	-6.47
4	RMF 1	60.42	12.49	4	-19.45
5	RMF 17	62.42	15.97	4	3.02
6	RMF 27	61.50	18.85	4	21.63
7	RMF 37	62.50	18.14	4	17.06
8	RMF 5-P-4	64.58	16.87	4	8.86
9	RMF 7-P-1	63.92	12.43	4	-19.80
10	SKNAK 501	64.44	8.91	4	-42.52
Trial Mean		63.11	15.50		

Table 64. Fruit yield (q/ha) in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Ranchi	Faizabad	Mean	Rank	Location
1	NDM 1	—	3.00	—	24.07	13.53	7	2
2	Phule MD 05-1	16.56	5.77	20.30	16.15	14.70	5	4
3	Phule MD 05-2	25.16	2.83	15.50	—	14.50	6	3
4	RMF 1	13.15	3.04	14.43	19.32	12.49	8	4
5	RMF 17	25.05	2.75	15.57	20.50	15.97	4	4
6	RMF 27	27.70	3.63	16.53	27.55	18.85	1	4
7	RMF 37	28.65	3.54	19.80	20.58	18.14	2	4
8	RMF 5-P-4	26.02	3.75	17.77	19.95	16.87	3	4
9	RMF 7-P-1	11.31	2.19	19.57	16.66	12.43	9	4
10	SKNAK 501	18.43	3.27	0.00	13.93	8.91	10	4
	Mean	21.34	3.38	17.43	19.86	15.50		
	CD (5%)	5.17	0.66	2.20	4.20	3.06		
	CV (%)	13.99	11.42	7.19	12.22	11.20		

Table 65. Days to fruit setting in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Faizabad	Ranchi	Mean	Rank
1	NDM 1	—	56.00	79.00	—	67.50	10
2	Phule MD 05-1	64.67	49.67	80.67	56.33	62.83	6
3	Phule MD 05-2	69.67	53.33	—	59.00	60.67	2
4	RMF 1	61.67	49.67	68.00	62.33	60.42	1
5	RMF 17	66.33	49.33	74.00	60.00	62.42	4
6	RMF 27	63.00	49.67	71.33	62.00	61.50	3
7	RMF 37	64.33	51.00	76.67	58.00	62.50	5
8	RMF 5-P-4	68.67	49.33	80.33	60.00	64.58	9
9	RMF 7-P-1	65.33	50.00	82.67	57.67	63.92	7
10	SKNAK 501	67.00	48.33	78.00	—	64.44	8
	Mean	65.63	50.63	76.74	59.42	63.11	
	CD (5%)	2.19	2.56	3.08	2.17		
	CV (%)	1.93	2.95	2.32	2.08		

Table 66. Number of fruits per plant in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Faizabad	Rahuri	Ranchi	Mean	Rank
1	NDM 1	—	29.90	61.00	—	—	45.45	3
2	Phule MD 05-1	28.33	51.67	49.33	—	45.67	43.75	7
3	Phule MD 05-2	39.33	27.33	—	—	46.33	37.66	10
4	RMF 1	25.33	39.77	47.33	18.83	57.67	37.79	9
5	RMF 17	47.67	32.17	70.67	18.17	52.33	44.20	6
6	RMF 27	51.67	47.00	51.33	14.43	60.00	44.89	5
7	RMF 37	48.00	43.33	79.67	17.06	59.67	49.55	1
8	RMF 5-P-4	51.00	38.67	71.00	26.66	52.33	47.93	2
9	RMF 7-P-1	30.33	54.00	58.33	23.00	60.00	45.13	4
10	SKNAK 501	36.00	45.77	46.00	—	—	42.59	8
	Mean	39.74	40.96	59.41	19.47	54.25	42.77	
	CD (5%)	7.83	9.34	5.91	7.41	5.78		
	CV (%)	11.38	13.30	5.75	4.07	6.07		

Table 67. Days taken to first picking in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Ranchi	Mean	Rank
1	NDM 1	—	69.33	—	69.33	1
2	Phule MD 05-1	78.00	64.00	77.33	73.11	5
3	Phule MD 05-2	82.33	67.33	77.00	75.56	9
4	RMF 1	73.33	64.00	77.67	71.67	2
5	RMF 17	78.33	64.67	79.67	74.22	6
6	RMF 27	78.00	63.33	81.33	74.22	7
7	RMF 37	75.00	65.33	78.00	72.78	4
8	RMF 5-P-4	82.33	66.67	83.00	77.33	10
9	RMF 7-P-1	81.00	63.33	81.33	75.22	8
10	SKNAK 501	80.33	64.00	—	72.17	3
	Mean	78.74	65.20	79.42	74.45	
	CD (5%)	2.51	3.49	3.47		
	CV (%)	1.84	3.12	2.49		

Table 68. Days taken to last picking in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Rahuri	Ranchi	Mean	Rank
1	NDM 1	—	91.67	—	—	91.67	1
2	Phule MD 05-1	112.67	96.33	—	106.67	105.22	10
3	Phule MD 05-2	115.67	89.67	—	110.00	105.11	9
4	RMF 1	111.67	93.67	—	107.00	104.11	8
5	RMF 17	116.33	91.67	77.00	106.67	97.92	3
6	RMF 27	111.33	98.00	78.00	109.00	99.08	5
7	RMF 37	113.67	95.00	78.00	108.33	98.75	4
8	RMF 5-P-4	118.33	92.33	78.00	108.33	99.25	6
9	RMF 7-P-1	116.00	98.00	77.00	106.67	99.42	7
10	SKNAK 501	112.67	95.67	78.00	—	95.44	2
Mean		114.26	94.20	77.67	107.83	98.49	
CD (5%)		2.59	6.66	1.79	4.43		
CV (%)		1.31	4.12	1.27	2.34		

Table 69. Number of pickings in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Rahuri	Ranchi	Mean	Rank
1	NDM 1	—	5.67	—	—	5.67	1
2	Phule MD 05-1	1.67	7.33	—	3.67	4.22	4
3	Phule MD 05-2	2.67	5.33	—	4.33	4.11	5
4	RMF 1	3.00	6.67	—	5.00	4.89	2
5	RMF 17	3.33	5.33	2.00	4.67	3.83	9
6	RMF 27	2.67	8.33	2.00	4.00	4.25	3
7	RMF 37	3.00	7.00	2.00	4.33	4.08	6
8	RMF 5-P-4	2.67	6.33	2.00	4.33	3.83	8
9	RMF 7-P-1	2.00	8.00	2.00	4.33	4.08	7
10	SKNAK 501	1.67	7.00	2.00	—	3.56	10
	Mean	2.52	6.70	2.00	4.33	3.89	
	CD (5%)	1.27	1.33	0.0	1.44		
	CV (%)	29.10	11.60	0.0	18.93		

Table 70. Single fruit weight (g) in Initial Varietal Trial (IVT) on Kankoda : 2005 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswer	Ranchi	Mean	Rank
1	NDM 1	—	6.95	—	6.95	10
2	Phule MD 05-1	10.60	8.86	7.90	9.12	1
3	Phule MD 05-2	12.90	5.58	7.03	8.50	4
4	RMF 1	10.12	6.05	9.07	8.41	6
5	RMF 17	10.25	6.77	7.67	8.23	8
6	RMF 27	10.99	7.65	7.50	8.71	3
7	RMF 37	13.56	6.56	6.83	8.98	2
8	RMF 5-P-4	10.89	6.26	8.00	8.39	7
9	RMF 7-P-1	8.53	6.08	8.10	7.57	9
10	SKNAK 501	10.20	6.73	—	8.46	5
	Mean	10.90	6.75	7.76	8.47	
	CD (5%)	2.81	1.10	0.70		
	CV (%)	14.92	9.54	5.15		

Table 71. Performance of Tumba entries in Initial Varietal Trial (IVT) during 2005 (Plains) - Mandor

S.No.	Genotypes	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over check variety
			Mean	Location	
1	RMT 401	3.80	2.43	1	-28.32
2	RMT 402	4.10	3.67	1	8.26
3	RMT 403	4.00	7.04	1	107.67
4	RMT 404	3.70	3.22	1	-5.01
5	RMT 405	4.30	3.11	1	-8.26
6	RMT 406	3.80	3.00	1	-11.50
7	RMT 407	3.90	5.44	1	60.47
8	RMT 408	3.70	1.54	1	-54.57
9	RMT 409	4.10	2.56	1	-24.48
10	RMT 59 (C)	3.70	3.39	1	0.00
Trial Mean		3.90	3.54		

Table 72. Different characters of Tumba entries in Initial Varietal Trial (IVT) during 2005 at Mandor (Plains)

S. No.	Genotypes	Seed yield (q/ha)	No. of fruits/ plant	Fruit yield/ plant (kg)	Single fruit weight (g)	Fruit circumference (cm)	100-seed weight(g)	Rank
1	RMT 401	2.43	8.40	1.47	174.00	23.40	3.80	9
2	RMT 402	3.67	11.80	2.47	209.00	25.30	4.10	3
3	RMT 403	7.04	14.80	3.24	219.00	24.80	4.00	1
4	RMT 404	3.22	11.80	2.01	172.00	23.90	3.70	5
5	RMT 405	3.11	9.70	2.18	225.00	22.80	4.30	6
6	RMT 406	3.00	8.80	1.76	200.00	24.90	3.80	7
7	RMT 407	5.44	11.80	2.67	226.00	26.60	3.90	2
8	RMT 408	1.54	11.80	1.43	121.00	21.70	3.70	10
9	RMT 409	2.56	8.70	2.17	248.00	23.70	4.10	8
10	RMT 59 (C)	3.39	10.70	1.60	150.00	22.10	3.70	4
	Mean	3.54	10.80	2.10	194.00	23.90	3.90	
	CD (5%)	1.21	2.40	0.60	33.10	2.20	0.70	
	CV (%)	19.80	12.90	16.30	9.90	5.30	10.00	

Table 73. Performance of Jatropha entries in Initial Varietal Trial (IVT) during 2005 (Plains)

S.No.	Genotypes	Mean 100 seed weight (g)	Mean yield over locations (q/ha)		Percent increase / decrease over Trial mean
			Mean	Location	
1	Chhatrapati	49.93	3.66	3	1.00
2	Hans Raj	48.06	3.67	3	1.41
3	Hisar J-1	50.95	3.62	2	0.09
4	ISJ-1	43.21	3.32	2	-8.16
5	Phule J-1	44.26	3.14	1	-13.40
6	S.K.Nagar (Big)	50.54	3.18	3	-12.03
7	SKNJ-4	39.23	2.67	1	-26.27
8	Urlikanchan	43.24	3.10	3	-14.31
Trial Mean		48.47	3.62		

Table 74. Seed yield (q/ha) in Initial Varietal Trial (IVT) on Jatropha : 2005 (Plains)

S.No.	Genotypes	S.K.Nagar	Hisar	Ambikapur	Mean	Rank	Location
1	Chhatrapati	1.75	5.12	4.1	3.66	2	3
2	Hans Raj	2.36	4.40	4.25	3.67	1	3
3	Hisar J-1	1.29	5.96	—	3.62	6	2
4	ISJ-1	2.15	—	4.5	3.32	3	2
5	Phule J-1	3.14	—	—	3.14	7	1
6	S.K.Nagar (Big)	1.64	5.02	2.9	3.18	4	3
7	SKNJ-4	2.67	—	—	2.67	8	1
8	Urlikanchan	1.47	4.74	3.1	3.10	5	3
	Mean	2.06	5.05	3.77	3.62		
	CD (5%)	—	0.66	—			
	CV (%)	—	0.09	—			

Table 75. Plant height (cm) in Initial Varietal Trial (IVT) on Jatropha : 2005 (Plains)

S.No.	Genotypes	Hisar	Mandor	S.K.Nagar	Bhubaneswar	Mean	Rank
1	Chhatrapati	459.50	115.0	187.25	111.87	218.40	2
2	Hans Raj	409.50	150.0	189.00	93.60	210.53	4
3	Hisar J-1	473.75	—	131.14	84.37	229.75	1
4	ISJ-1	—	—	223.79	108.87	166.33	6
5	Phule J-1	—	117.5	198.78	100.83	139.04	7
6	S.K.Nagar (Big)	423.75	106.3	210.47	104.63	211.28	3
7	SKNJ-4	—	106.3	192.08	94.17	130.83	8
8	Urlikanchan	386.25	160.0	183.66	103.80	208.43	5
	Mean	430.55	125.8	189.52	100.27	211.54	
	CD (5%)	63.34	—	—	30.08		
	CV (%)	9.54	—	—	17.09		

Table 76. Stem girth (cm) in Initial Varietal Trial (IVT) on Jatropha : 2005 (Plains)

S.No.	Genotypes	Hisar	Mandor	S.K.Nagar	Bhubaneswar	Mean	Rank
1	Chhatrapati	38.2	15.7	24.81	15.03	23.44	5
2	Hans Raj	38.6	17.8	27.68	12.57	24.16	4
3	Hisar J-1	47.1	—	22.10	12.07	27.09	1
4	ISJ-1	—	—	30.11	15.00	22.56	6
5	Phule J-1	—	16.0	31.40	13.87	20.42	7
6	S.K.Nagar (Big)	43.2	16.0	29.12	14.37	25.67	2
7	SKNJ-4		17.5	29.82	12.73	20.02	8
8	Urlikanchan	35.7	20.0	28.62	13.43	24.44	3
	Mean	39.62	17.2	27.96	13.63	24.60	
	CD (5%)	2.13	—	—	3.45		
	CV (%)	3.50	—	—	14.42		

Table 77. No. of branches per plant in Initial Varietal Trial (IVT) on Jatropha : 2005 (Plains)

S.No.	Genotypes	Hisar	Mandor	S.K.Nagar	Bhubaneswar	Mean	Rank
1	Chhatrapati	14.75	11.5	4.27	4.13	8.66	2
2	Hans Raj	11.25	13.3	5.01	3.80	8.33	3
3	Hisar J-1	17.50	—	3.08	4.30	8.29	4
4	ISJ-1	—	—	6.40	3.73	5.07	8
5	Phule J-1	—	13.0	4.75	4.13	7.29	7
6	S.K.Nagar (Big)	12.75	18.0	5.84	4.47	10.26	1
7	SKNJ-4	—	12.3	6.13	4.93	7.80	5
8	Urlikanchan	9.75	12.0	3.19	4.33	7.32	6
	Mean	13.20	13.3	4.83	4.23	8.90	
	CD (5%)	1.76	—	—	1.74		
	CV (%)	8.64	—	—	23.42		

Table 78. 100 seed weight (g) in Initial Varietal Trial (IVT) on Jatropha : 2005 (Plains)

S.No.	Genotypes	Hisar	S.K.Nagar	Mean	Rank
1	Chhatrapati	55.10	44.76	49.93	3
2	Hans Raj	51.00	45.11	48.06	4
3	Hisar J-1	60.78	41.12	50.95	1
4	ISJ-1	—	43.21	43.21	7
5	Phule J-1	—	44.26	44.26	5
6	S.K.Nagar (Big)	56.95	44.12	50.54	2
7	SKNJ-4		39.23	39.23	8
8	Urlikanchan	48.45	38.02	43.24	6
	Mean	54.46	42.48	48.47	
	CD (5%)	0.47	—		
	CV (%)	0.56	—		

GERMPLASM EVALUATION

III. GERMPLASM EVALUATION

3.1 HILLS

Multilocational germplasm evaluation was planned to be conducted on grain amaranth, buckwheat, chenopods, rice bean, adzuki bean, Coix and Perilla. The germplasm accessions were evaluated in augmented design with standard check cultivars.

3.1.1 GRAIN AMARANTH (*Amaranthus* spp.)

Germplasm screening nursery consisting of 50 accessions supplied by NBPGR, Shimla was to be evaluated at three locations viz. GBPUA&T, Ranichauri; CSK HPKV, Palampur and NBPGR, Shimla. The results were received from all the three locations. The checks used were PRA 1, PRA 2, Annapurna and Suvarna. The list of promising for all characters have been presented in table 79 and the range and means in table 80.

At GBPUA&T, Ranichauri a set of 54 genotypes including three checks were evaluated for 12 characters. No entry was found better than the checks in respect of seed yield per plant, days to flowering and maturity. The longest inflorescence 56.3 cm was recorded in the genotype IC 95341 followed by IC 95315 (51.00 cm).

A total of 24 genotypes were also evaluated at CSK HPKV, Palampur for four characters only. IC 042311-17 (59 days) was earliest in flowering and maturity. Maximum plant height (140.00 cm) was observed in the genotype IC 095253 followed by IC 037151 (139.00 cm). The genotype IC 37148 was observed as the highest yielder with 9.0 q/ha and followed by IC 021810 (6.59 q/ha). IC 095232 genotype was found to have maximum number of primary branches.

A set of 54 genotypes including checks were screened at NBPGR, Shimla for eight quantitative characters (Table 80) and 12 qualitative (Table 81) and. IC 37150 (69 days) was found superior to the check variety for days to 50%

flowering. Maximum plant height (329.00 cm) was recorded in genotype IC 95308. The longest inflorescence (100.05 cm) was recorded in genotype IC 37149 followed by IC 95308 with 84.35 cm and 84.30 cm, respectively. IC 37148 (474.02 g) and IC 42284-5 (455.15 g) genotypes were found superior to the check variety in respect of seed yield per plant.

Flowering time was the earliest at Palampur (65.5 days) followed by at Ranichauri centre (69.6), while it was moderately late at Shimla (91.2 days). No entry showed early flowering and maturity with respect to checks based on the average over all the 3 locations.

Based on the average over locations, IC 037148 (278.00 g) was the highest yielding line followed by IC 037153 (268.99 g).

The length of inflorescence of the entries was highest at Shimla (70.2 cm) followed by Ranichauri (37.6 cm). Based on the average over two locations, IC 037149 had longest inflorescence (70.53 cm).

3.1.2 BUCKWHEAT (*Fagopyrum* spp.)

A set of 50 accessions were to be screened at three locations viz. NBPGR, Shimla; GBPUA&T, Ranichauri and CSK HPKV, Palampur along with three checks Himpriya, VL 7 and PRB 1. The list of promising for all characters have been presented in table 82 and mean and range in table 83.

A set of 48 genotypes including checks Himpriya and PRB 1 were evaluated at GBPUA&T, Ranichauri for yield and its related characters. No entry was found superior to the check variety for days to flowering and maturity while a few of the genotypes [IC 341679 (162.11 g), IC 274439 (135.13 g)] was found better than the checks in respect of seed yield per plant. Maximum height (130.00) was recorded in the genotype EC 272442 while maximum number of branches (6) was observed in the genotype IC 258232.

A set of 38 genotypes including one check was screened for six yield related attributes at CSK HPKV, Sangla. Early flowering (53 days) was noted in

the genotype IC 341591 followed by IC 381120 (55 days) whereas early maturity (86 days each) was observed in the genotypes IC 381120 and IC 381129. Genotype IC 274439 was recorded as the highest yielder with 4.60 g seed yield per plant followed by IC 323729 with seed yield of 4.50 g per plant.

Significant differences were observed among the entries for grain yield at Sangla. Genotypes IC 274424 (44.88 q/ha) and IC 274439 (36.20 q/ha) were found better than the checks in respect of seed yield. The highest test weight (1000 seed weight) was observed in genotypes IC 274439 (48 g) followed by IC 311074 (45 g). The maximum plant height (174.6 cm) was recorded in genotype IC 341674 followed by IC 341682 (154.0 cm).

At NBPGR, Shimla a set of 50 accessions were evaluated for thirteen quantitative characters along with two national checks Himpriya and PRB 1. The genotype IC 258232 was observed as the early flowering type (44 days) and IC 280394 was the early maturing type with 88 days maturity. This set of 50 accessions was also evaluated for 11 qualitative traits (Table 84).

A set of 95 genotype were screening for seven quantitative characters at NBPGR, Shillong. The maximum plant height (129.7 cm) was observed in genotype IC 384730 and followed by Reshawat (117.0 cm). The highest number of branches was recorded in the genotype DRLT-1220 (7.7). The genotype IC 291623 had the highest test weight (3.0 g). The early maturity was observed in IC 324244 (62.0 days). The range and mean for all characters have been presented in table 85.

The performance of the accessions as compared to the checks over locations viz. Ranichauri, Shimla and Sangla has been summarized as below.

Significant difference were observed among the entries for seed yield per plant at the two locations. Mean seed yield per plant was high at Shimla (21.4 g) but low at Sangla (10.7 g). Based on the average over locations, the entry IC 258232 (85.8 g) was the highest yielding accession.

Average plant height of the entries was the highest at Shimla (106.6 cm) followed by Sangla (104.6 cm). Based on average over three locations, IC 341674 had the highest plant height (134.9 cm).

Flowering time varied from centre to centre but mean flowering time was the earliest at Ranichauri (42.00 days) followed by Shimla (55 days). On the basis of average over three locations no accession was found superior to the best check.

Maturity period also showed similar trend to that of the flowering time. Average maturity period was the earliest at Ranichauri (96.5 days) followed by Shimla (111.1 days). On the basis of average over the locations, no superior accession was found.

The average test weight was higher at Sangla (33 g) as compared to that at Shimla (19.3 g). On the basis of average over the locations, EC 323724 (33.3g) possessed the highest test weight followed by IC 329593 (30.06 g).

3.1.3 CHENOPODS (*Chenopodium* spp.)

Twenty five genotypes were planned for screening at two locations viz. NBPGR, Shimla and GBPUA&T, Ranichauri along with local checks. The list of promising for all characters have been presented in table 86 and mean and range in table 87.

Twenty six genotypes along with the local check were evaluated for eight qualitative (Table 88) and ten quantitative characters at Shimla. The early flowering (68 days) and early maturity (118 days) were observed in the genotype IC 415477. Highest inflorescence length (65.50 cm) was recorded in the genotype IC 109734 followed by IC 107295 (65.20 cm). The genotype IC 415477 was recorded as the top yielding variety as well as having highest test weight (1.40 g). Genotype IC 343192 was the tallest entry (270.40 cm).

3.1.4 RICE BEAN (*Vigna umbellata*)

A set of fifty genotypes along with four standard checks viz. PRR 1, PRR 2, RBL 6 and BRS 1 were planned for evaluation in Augmented Design at five locations viz. NBPGR, Shimla; GBPUA&T, Ranichauri, CSK HPKVV, Palampur; NBPGR, Bhowali and NBPGR, Shillong. The list of promising for all characters have been presented in table 89 and mean and range in table 90.

A total of 53 genotypes were evaluated for nine yield related characters at GBPUA&T, Ranichauri. The genotypes BRS 2 was found superior to the check varieties PRR 1 and PRR 2 for flowering, maturity and pod length. Maximum plant height (133.00 cm) was found in the genotype RBL 6 followed by LRB 11 (122.00). Maximum number of pods per plant was recorded in LRB 22-2 followed by IC 342379.

Fifty one genotypes were screened for four major characters at CSK HPKVV, Palampur and it was found that IC 335412 was early flowering (50 days) as equivalent to check PRR 1. Early maturity was observed (118 days) in genotypes LRB 751 and LRB 008. Highest seed yield (q/ha) was recorded (23.38 q/ha) in the genotype IC 374483 followed by LRB 351 (23.05 q/ha).

A set of 52 genotypes were screened for qualitative (Table 91) and quantitative characters at NPBGR, Shimla. Early maturity was observed in the genotype, LRB-7 (150 days) followed by LRB 22-2 (152.00 days). Longest pod (14.30 cm) was recorded in the genotype LRB 36 followed by LRB 75-1 (14.10 cm). Maximum 100 seed weight (9.64 g) was recorded with the genotype LRB-23 followed by LRB-74-3 (9.56 g). The highest no. of branches per plant (12.00) was observed in the genotype IC 342379 followed by LRB-159 (11.80).

A set of 54 genotypes including checks were screened for nine quantitative characters at NBPGR, Shillong. No entry was observed to be early in maturity and flowering compared to the checks. The genotypes LRB 053 (19.03 q/ha) and LRB 075-2 were recorded to be high yielders. Longest pod was observed in the genotype LRB 199 (12.10 cm) followed by LRB 036 (12.05 cm). Maximum 100 seed weight was observed in the genotype IC 330410 (11.0 g)

followed by RD 107 (10.60 g). The maximum plant height (158.45 cm) was found in the genotype RD 107 followed by LRB 053 (146.50 cm).

Sixty two genotypes were evaluated for eight yield contributing characters at NBPGR, Bhowali. Accession IC 436977 was noted as early type with 67 days flowering time. Early maturity was recorded in LRB 5 (64 days) followed by LRB-79 (126 days). Longest pod was observed in the genotype LRB 199 (15.80 cm) followed by LRB 141 (14.50 cm). Maximum 100 grain weight was recorded (13.70 g) in the genotype IC 342379 (13.7 g) followed by IC 444172(10.40 g). Highest seed yield per plant was observed in the genotype LRB-9 (18.12 g) followed by LRB-10 (16.2 g) and IC444191 (15.69 g).

Summary performance of accessions based average over the location have been given below as :

Seed yield level was moderate at all the centres. The average seed yield ranged from 11.0 q/ha at Shillong to 14.4 q/ha at Bhowali. On the basis of average over 3 locations, the entry LRB 009 (26.37 q/ha) was the highest yielder followed by LRB 10 (21.46 q/ha).

The mean flowering time was the earliest at Palampur (59.0 days) closely followed by Shillong (70.7 days) while it was the longest at Shimla (91.6 days). Based on the average over locations.

Maturity period showed wide variation among the locations. The earliest maturity was observed at Shillong (107.9 days) while it was late at Ranichauri (171.5 days). On the basis of five locations, no entry was superior to the best check.

Plant height showed extreme variation ranging from 80.7 cm to 169.5 cm. Plant height was the highest at Bhowali (169.5 cm) followed by Shillong (108.9 cm) centre. Moderate plant height was observed at Palampur. Based on the average over locations, entry IC 44172 (230.00 cm) was the tallest.

100 seed weight (g) recorded at Shimla, Bhowali and Shillong centres showed that it was the highest at Bhowali (8.1 g) and low at Shillong (6.4 g). Based on the average over three locations entry IC 44172 (10.40 g) showed the highest test weight.

Grain yield per plant recorded at two locations showed that it was highest at Ranichauri (21.7 g) and lowest at Bhowali (6.8 g). Based on the average over two locations, the entry LRB 022 had the highest grain yield per plant (37.95 g) followed by LRB 015 (29.54 g).

Pod length (cm) did not show considerable variation among the locations and ranged from (9.00 cm to 11.1 cm). On the basis of average over the four locations entry LRB 075-2 (12.00 cm) and LRB 076 (12.00 cm) showed the longest pod length.

No. of branches per plant recorded at three centres showed that it was the highest at Shimla (10.1) and lowest at Palampur (0.2). Based on the average over the locations, entry LRB 084 (8.15) had the highest number of branches.

3.1.5 ADZUKI BEAN (*Vigna angularis*)

A set consisting of 25 accessions supplied by NBPGR, Shimla was planned to be evaluated along with local check at three locations viz. NBPGR, Shimla; GBPUAT, Ranichauri and CSK HPKV, Palampur. The list of promising for all characters have been presented in table 92 and mean and range in table 93.

At CSK HPKV, Palampur twenty six accessions including exotics were evaluated along with check HPAU 27-9 for four yield related characters. Genotype EC 341960 was recorded as early flowering and EC 341952 early maturing type with 37 days and 61 days respectively. EC 340247 was found to be the highest seed yielder with 13.69 q/ha seed yield followed by genotype EC 030256.

A total of 28 genotypes were evaluated along with check HPAU 51 in an Augmented Design at NBPGR, Shimla for qualitative and quantitative characters.

The tallest plant height was found in the genotype EC 008707. Early flowering (66 days) was recorded in the genotype, EC 015257 whereas early maturity (143 days) was recorded in the genotype EC 340247 followed by EC 340264 (143). Maximum number of pods per plant (28.30) was found in the genotype, EC 290251 followed by EC 187896.

The performance of the entries based on two centres (Shimla and Palampur) were given below as:

Flowering time varied from 55 to 68 days at Shimla and from 37.00 to 72.00 days at Palampur. Mean flowering time was the earliest at Shimla (60.94 days) followed by Palampur (66.25 days). On the basis of average over two locations, entry EC 341955 was the earliest in flowering (51.00 days).

Average maturity period was the earliest at Palampur (94.92) and longest at Shimla (145.66 days). No genotype was superior to check based on average of two locations.

Average plant height was recorded to be the highest at Palampur (61.63 cm) followed by Shimla (37.46 cm). Based on average over two locations, entry EC 341952 was the tallest (78.0 cm).

At Ranichauri 13 lines were evaluated for eight characters. The details of the observations recorded are given in table 94. The details of qualitative characters recorded at Shimla have been presented in table 95.

3.1.6 JOB'S TEAR (*Coix lacryma-jobi*)

Germplasm lines comprising 20 accessions were planned to be evaluated at three locations viz. NBPGR, Shillong; GBPUA&T, Ranichauri and CSK HPKV, Palampur. However, the results have been received from Ranichauri and Shillong centres. The list of promising for all characters have been presented in table 96 and mean and range for Ranichauri and Shillong in table 97 and 98, respectively.

Five yield related characters were recorded at GBPUA&T, Ranichauri. The mean seed yield was found to be 4.50 q/ha. Green forage yield (304.00 q/ha), dry matter yield (31.00 q/ha) and seed yield (9.49 q/ha) were recorded highest in the genotype, RVN 90 indicating its potential for better yield. Highest no. of tillers per plant (7) was found in the genotype H 306 followed by BD 03 (6).

A total of 47 genotypes were evaluated along with two checks in Augmented Design in NBPGR, Shillong for eight yield attributes and two quantitative characters. The highest number of tillers was recorded in the genotype UR-29 (3.50) followed by BDS-1870 (3.40). The entry DRLT-1560 had the highest seed yield (69.40 q/ha). The early maturity was observed in genotype UR-29 (66.0 days) and BDS-1868 (67.0 days).

3.1.7 BHANGJIRA (*Perilla frutescense*)

A set of 20 genotypes were to be evaluated at two locations viz. NBPGR, Shillong and GBPUA&T, Ranichauri. Results have been received from all centres. The list of promising for all characters have been presented in table 99 and mean and range for Ranichauri and Shillong in table 100 and 101 respectively.

At GBPUA&T, Ranichauri, a set of 20 genotypes were evaluated for nine yield contributing characters. The genotypes, BDS 1647 and BDS 1650 were found early flowering as well as early maturing type. The maximum number of fingers (32.00) per plant was recorded in the genotype RD 071 followed by H 1812 (30.50). Genotype, H 1812 was observed as the highest seed yielder (22.40 g/plant) followed by RD 029 (22.12 g). Longest finger are observed in genotype H 0664 (8.8 cm) and RD 074 (8.6 cm). Maximum plant height (98.4 cm) was recorded in BDS 1649 followed by BDS 1647 (85.5 cm).

A total of 24 genotypes including checks were evaluated at Shillong centre. No entry was found earlier in maturity to local check. The maximum plant height (293.33 cm) was observed in genotype H-3944 followed by BDS-1649 (291.0 cm). The highest seed yield per plant was recorded in genotype BDS-1650 (34.0 g) followed by BDS-1644 (30.58 g). The genotype BDS-1644 had also highest seed yield (15.26 q/ha).

Table 79. Promising lines in grain amaranths germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Ranichauri (accessions 50)				
1.	Days to 50% flowering	50.4-82.0	No Accessions	Suvarna (50.4 days)
2.	Days to maturity	122.0-148.0	No accessions	Suvarna (122.0 days)
3.	Plant height (cm)	56.7-131.7	IC42265-3, IC95341, IC37151, IC37150, IC41766, IC42264-16, IC95315, IC37156, IC95308, IC95396, IC41765, IC95314 > (110.0 cm)	Annapurna (92.34 cm)
4.	Inflorescence length (cm)	20.0-56.3	IC95341, IC95315, IC95314, IC95308, IC95320, IC37151, IC95396, IC95353, IC38501, IC42284-5 > (44.0 cm)	Annapurna - (38.59 cm)
5.	Finger length (cm)	6.5-18.0	IC95341, IC37149, IC37150, IC95320, IC38542 > (13.0 cm)	Suvarna (11.06 cm)
6.	No. of finger per plant	14.0-33.3	IC37152, IC37156, IC37151, IC37155 > (29)	Suvarna (13.89)
7.	Length of leaf (cm)	8.0-18.7	IC37151, IC41766, IC41765, IC95249, IC38542, IC37152, IC95251 > (15.0 cm)	Annapurna (12.79 cm)
8.	Width of leaf (cm)	3.5-10.0	IC37151, IC41766, IC37150, IC41765, IC95249, IC38542, IC37149, IC41769, IC95284 > (7.0 cm)	Annapurna (6.33 cm)
9.	No. of leaves per plant	15.0-31.0	IC37156, IC37151, IC37155, IC41769, IC37152 > (26)	PRA2 (22.796)
10.	Plant girth at base (cm)	0.5-1.3	IC37152 > (1 cm)	Annapurna (0.96 cm)
11.	10 ml seed weight (g)	10.0-12.4	IC42265-2, IC95291, IC38116, IC41766, IC37158 > (12.0 g)	Suvarna (11.87 g)
12.	Seed yield per plant (g)	20.4-110.4	No Accessions	PRA-1 (110.39 g)
Shimla (Accessions 50)				
1.	Days to 50% flowering	69.0-97.0	IC37150, IC37156, IC38313, IC42265-3, IC38119, IC37158, IC95284, IC95320 < (85.0 days))	Annapurna (92.67 days)
2.	Stem thickness (cm)	1.5-2.6	IC95315, IC42265-2, IC95308, IC95341, IC38474, IC42284-5, IC21810, IC41765, IC38127, IC37154, IC95353 > (2.35 cm)	Annapurna (2.35 cm)
3.	Plant height (cm)	184.5-329.0	IC95308, IC42265-2, IC95320, IC95315 > (290 cm)	PRA-2 (248.53 cm)

S.No.	Characters	Range	Promising lines	Highest value of best check
4.	Leaflet spikelet length (cm)	5.8-27.2	IC95308, IC37153, IC37146, IC37149, IC95249, IC37155, IC38312, IC37148 > (21.0 cm)	Annapurna (17.5 cm)
5.	Inflorescence length (cm)	42.9-100.1	IC37149, IC95308, IC37148, IC42311-7, IC95253, IC42284-5, IC95396, IC21810, IC37153 > (79.0 cm)	Annapurna (70.73 cm)
6.	Days to 80% maturity	127.0-180.0	IC42265-3, IC37149, IC38119, IC38313, IC37156 < (168.0 cm)	Annapurna (171.67 days)
7.	Yield per plant (g)	108.2-474.0	IC37148, IC42284-5, IC38312, IC37153, IC42265-2 > (429.0 g)	Annapurna (390.49 g)
8.	1000 seed weight (g)	0.4-0.8	IC37148, IC37149, IC95341, IC38313, IC37154 > (0.77 g)	PRA-2 (0.70 g)
Palampur (Accessions 24)				
1.	Days to flowering	59.0-74.0	IC042311-17 < (60 days)	PRA-2 (61.5 days)
2.	Plant height (cm)	106.0-140.0	IC095253, IC037151, IC038127, IC037148, IC095353 > (131 cm)	PRA-3 (119.5 cm)
3.	No. of branches per plant	1.0-2.0	IC095253, IC042311-17, IC037147, IC021810 > (1.5)	Annapurna(1.5) PRA-2 (1.5)
4.	Seed yield (q/ha)	1.0-9.0	IC037148, IC021810, IC042006, IC095284, IC095253, IC042264-16, IC095301, IC042311-17, IC095341 > (4.5 q/ha)	PRA-3 (3.92 q/ha)
Best entries over locations				
1.	Leaf length (cm)	11.9-19.8	IC095284, IC095249, IC041766, IC042311-7, IC095320, IC037151, IC041765, IC038542, IC037150, IC037156, IC042265-3 > (18.0 cm)	Annapurna (16.76 cm)
2.	Days to 50% flowering	50.4-89.0	No Accessions	Suvarna (50.40 days)
3.	Plant height (cm)	86.8-222.3	IC095308, IC042265-2, IC042284-5, IC095320, IC041766, IC095288, IC041765, IC095315, IC095291, IC041769, IC037154, IC095314, IC095302, IC037152, IC095396, IC095341, IC042311-7, IC037145, IC095249 > (165.0 cm)	PRA-2 (150.64 cm)
4.	Days to maturity	117.5-161.5	No Accessions	PRA-3 (117.50 days)
5.	Inflorescence length (cm)	35.2-70.5	IC037149, IC095308, IC095396, IC042284-5, IC095314, IC042311-7, IC037153 > (60.0 cm)	Annapurna (54.67 cm)
6.	Seed yield per plant (g)	53.7-278.1	IC037148, IC037153, IC042284-5, IC038312 > (268.0 g)	Annapurna (247.11 g)

Table 80: Multilocation evaluation of germplasm lines in grain amaranth at Shimla, Ranichauri and Palampur – Hills (2005)

S. No.	Accession No.	Leaf length (cm)			Days to 50% flowering				Plant height (cm)				Days to maturity				Inflorescence length (cm)		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Palampur	Mean	Shimla	Ranichauri	Palampur	Mean	Ranichauri	Shimla	Palampur	Mean	Shimla	Ranichauri	Mean
1	IC021810	23.5	11.0	17.2	91.0	80.0	65.0	78.7	247.1	67.0	109.0	141.0	146.0	177.0	116.0	146.3	80.5	29.5	55.0
2	IC037145	21.6	12.7	17.1	93.0	77.0		85.0	257.3	78.0		167.6	144.0	177.0		160.5	70.3	33.7	52.0
3	IC037146	19.4	13.3	16.3	90.0	56.0		73.0	226.8	87.0		156.9	130.0	177.0		153.5	66.8	32.7	49.7
4	IC037147	18.9	10.7	14.8	95.0	67.0	70.0	77.3	244.6	80.3	113.0	146.0	140.0	177.0	108.0	141.7	71.9	36.6	54.3
5	IC037148	19.5	12.7	16.1	95.0	72.0	61.0	76.0	270.3	76.0	138.0	161.4	140.0	176.0	119.0	145.0	84.3	30.0	57.2
6	IC037149	21.8	14.0	17.9	92.0	70.0	67.0	76.3	249.6	107.3	130.0	162.3	138.0	148.0	108.0	131.3	100.1	41.0	70.5
7	IC037150	21.9	14.7	18.3	69.0	51.0	65.0	61.7	220.8	126.0	118.0	154.9	124.0	177.0	116.0	139.0	63.4	40.3	51.9
8	IC037151	18.9	18.7	18.8	93.0	72.0	64.0	76.3	216.6	128.0	139.0	161.2	140.0	177.0	108.0	141.7	64.4	46.3	55.3
9	IC037152	19.7	15.7	17.7	94.0	77.0		85.5	236.2	105.0		170.6	145.0	177.0		161.0	70.3	35.3	52.8
10	IC037153	17.9	11.7	14.8	92.0	61.0	62.0	71.7	229.0	77.3	122.0	142.8	128.0	176.0	119.0	141.0	80.0	40.0	60.0
11	IC037154	20.3	13.0	16.7	95.0	82.0		88.5	266.0	84.0		175.0	148.0	175.0		161.5	72.3	37.3	54.8
12	IC037155	18.5	10.3	14.4	92.0	77.0		84.5	249.0	78.7		163.8	145.0	173.0		159.0	73.4	30.3	51.9
13	IC037156	22.0	14.3	18.2	70.0	56.0		63.0	190.6	119.7		155.1	131.0	148.0		139.5	51.6	40.0	45.8
14	IC037158	20.7	11.7	16.2	83.0	70.0		76.5	186.5	60.0		123.3	140.0	173.0		156.5	71.4	34.3	52.9
15	IC037160	20.7	12.0	16.3	87.0	77.0		82.0	240.7	64.7		152.7	144.0	172.0		158.0	66.8	38.7	52.7
16	IC037314	20.6	12.0	16.3	95.0	72.0		83.5	249.5	66.3		157.9	141.0	169.0		155.0	71.3	26.0	48.7
17	IC037316	20.8	11.7	16.2	91.0	82.0	70.0	81.0	239.9	58.7	116.0	138.2	146.0	169.0	119.0	144.7	64.3	32.7	48.5
18	IC038119	24.3	10.0	17.1	83.0	67.0	67.0	72.3	200.3	78.3	115.0	131.2	142.0	148.0	117.0	135.7	69.0	30.3	49.6
19	IC038127	20.9	11.7	16.3	91.0	67.0	62.0	73.3	222.4	61.8	139.0	141.1	140.0	169.0	117.0	142.0	75.3	29.0	52.2
20	IC038312	19.0	10.7	14.8	93.0	70.0		81.5	216.7	56.7		136.7	141.0	169.0		155.0	73.8	30.3	52.1
21	IC038313	23.4	11.7	17.5	71.0	72.0	62.0	68.3	184.5	70.0	114.0	122.8	141.0	148.0	108.0	132.3	55.1	30.7	42.9
22	IC038474	22.3	8.0	15.2	95.0	82.0		88.5	246.4	65.0		155.7	148.0	168.0		158.0	72.4	20.0	46.2
23	IC038483	21.1	14.0	17.6	95.0	67.0	65.0	75.7	240.7	100.0	118.0	152.9	140.0	168.0	118.0	142.0	67.9	41.3	54.6

S. No.	Accession No.	Seed yield /plant (g)			Shimla				Ranichauri						Palampur		
		Shimla	Ranichauri	Mean	Lateral spikelet length (cm)	Stem thickness (cm)	Petiole length (cm)	1000 seed weight (g)	Finger length (cm)	No. of finger /plant	Width of leaf (cm)	No. of leaves /plant	Plant girth at base (cm)	10 ml seed weight	No. of branches/ plant	Seed yields/plot (Kg)	Seed yield (q/ha)
1	IC021810	386.6	20.4	203.5	17.3	2.4	14.5	0.7	8.2	22.5	6.0	18.0	0.5	10.8	2.0	0.2	6.5
2	IC037145	308.5	45.0	176.8	14.7	2.2	10.1	0.6	9.5	18.7	6.0	21.5	0.8	11.1			
3	IC037146	338.7	78.5	208.6	23.2	2.1	8.8	0.6	10.8	20.0	5.7	20.0	0.5	11.2			
4	IC037147	301.8	53.8	177.8	20.8	2.1	9.0	0.7	11.5	18.3	5.3	17.7	0.5	11.4	2.0	0.0	1.5
5	IC037148	474.0	82.1	278.1	21.3	2.3	9.9	0.8	10.5	24.3	6.7	15.7	1.0	11.5	1.0	0.3	9.0
6	IC037149	425.5	96.0	260.8	22.8	2.3	10.3	0.8	15.0	26.0	7.7	22.8	1.0	11.3	1.0	0.1	1.8
7	IC037150	191.1	89.7	140.4	6.3	2.0	15.0	0.7	14.8	25.7	8.3	25.3	0.5	11.4	1.0	0.0	1.2
8	IC037151	270.0	109.0	189.5	12.3	1.7	7.7	0.6	8.8	30.7	10.0	30.3	1.0	11.7	1.0	0.1	2.8
9	IC037152	308.6	38.4	173.5	14.0	2.0	8.6	0.6	12.6	33.3	7.0	27.0	1.3	11.1			
10	IC037153	436.0	102.0	269.0	27.1	2.1	9.1	0.7	10.4	23.0	6.0	19.7	0.8	11.8	1.0	0.0	1.5
11	IC037154	170.5	78.0	124.3	20.7	2.4	11.2	0.8	8.8	19.3	6.0	24.0	0.6	10.4			
12	IC037155	333.8	87.5	210.6	21.8	2.3	9.9	0.6	11.8	30.0	5.0	28.0	0.8	11.1			
13	IC037156	380.5	75.9	228.2	6.6	1.5	15.4	0.7	11.5	32.3	7.0	31.0	1.0	11.6			
14	IC037158	255.1	80.1	167.6	13.5	1.8	10.5	0.6	9.8	22.0	5.0	16.3	0.5	12.1			
15	IC037160	378.1	72.5	225.3	21.0	2.2	10.8	0.6	7.6	25.0	5.7	24.7	0.5	11.5			
16	IC037314	220.3	81.1	150.7	19.6	2.3	11.5	0.6	6.5	25.7	5.0	21.0	0.5	10.1			
17	IC037316	395.2	74.6	234.9	16.4	2.3	10.9	0.6	10.0	21.7	5.0	20.0	0.5	12.1	1.0	0.0	1.5
18	IC038119	108.2	62.9	85.6	5.8	2.2	16.3	0.4	8.7	26.0	5.0	19.7	1.0	11.8	1.0	0.1	1.7
19	IC038127	390.0	80.0	235.0	18.6	2.4	10.8	0.7	10.0	26.3	5.0	15.0	0.5	11.1	1.0	0.0	1.0
20	IC038312	445.0	91.1	268.1	21.4	2.1	10.2	0.6	8.8	21.0	4.0	22.5	0.6	10.3			
21	IC038313	195.6	42.4	119.0	10.3	2.3	16.1	0.8	9.5	17.3	5.3	19.7	0.8	11.0	1.0	0.1	2.5
22	IC038474	350.1	62.4	206.2	8.4	2.4	10.5	0.6	7.5	21.0	3.5	17.5	0.5	11.1			
23	IC038483	340.5	72.8	206.7	11.1	2.0	10.0	0.7	10.5	23.3	7.0	20.7	0.8	10.3	1.0	0.1	3.3

S. No.	Accession No.	Leaf length (cm)			Days to 50% flowering				Plant height (cm)				Days to maturity				Inflorescence length (cm)		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Palampur	Mean	Shimla	Ranichauri	Palampur	Mean	Ranichauri	Shimla	Palampur	Mean	Shimla	Ranichauri	Mean
24	IC038501	20.7	11.0	15.9	97.0	61.0	62.0	73.3	244.3	102.7	113.0	153.3	132.0	168.0	118.0	139.3	72.9	44.0	58.5
25	IC038542	20.2	16.7	18.4	96.0	77.0		86.5	217.7	105.3		161.5	146.0	168.0		157.0	70.1	38.7	54.4
26	IC041765	20.5	17.0	18.8	91.0	68.0		79.5	249.8	113.3		181.5	136.0	168.0		152.0	63.4	40.0	51.7
27	IC041766	21.0	18.0	19.5	94.0	68.0		81.0	258.0	126.0		192.0	136.0	169.0		152.5	60.3	38.7	49.5
28	IC041769	21.3	12.0	16.7	95.0	61.0		78.0	242.7	109.3		176.0	129.0	169.0		149.0	71.4	36.7	54.0
29	IC042006	22.4	10.7	16.5	97.0	72.0	65.0	78.0	270.5	101.0	117.0	162.8	140.0	169.0	115.0	141.3	73.8	40.3	57.1
30	IC042264-16	22.0	12.3	17.2	96.0	70.0	73.0	79.7	240.6	121.3	128.0	163.3	140.0	169.0	115.0	141.3	73.5	42.6	58.1
31	IC042265-2	19.3	12.3	15.8	94.0	61.0		77.5	300.4	107.3		203.8	130.0	171.0		150.5	64.2	39.0	51.6
32	IC042265-3	23.5	12.7	18.1	72.0	62.0		67.0	193.5	131.7		162.6	132.0	127.0		129.5	42.9	27.7	35.3
33	IC042284-5	22.7	13.0	17.9	94.0	68.0		81.0	289.1	102.7		195.9	136.0	172.0		154.0	81.8	44.0	62.9
34	IC042290-17	21.6	13.0	17.3	93.0	70.0	59.0	74.0	263.6	88.3	128.0	160.0	140.0	171.0	108.0	139.7	74.3	36.0	55.2
35	IC042311-7	23.5	14.7	19.1	94.0	72.0		83.0	239.9	97.3		168.6	141.0	172.0		156.5	82.8	39.7	61.2
36	IC095249	22.2	17.0	19.6	95.0	75.0		85.0	231.8	100.0		165.9	144.0	173.0		158.5	74.4	40.0	57.2
37	IC095251	20.8	15.0	17.9	96.0	77.0	74.0	82.3	222.0	98.7	119.0	146.6	146.0	176.0	119.0	147.0	65.6	34.0	49.8
38	IC095253	22.4	12.7	17.5	94.0	78.0	61.0	77.7	218.0	84.0	140.0	147.3	146.0	176.0	119.0	147.0	81.9	35.7	58.8
39	IC095284	24.9	14.7	19.8	83.0	72.0	67.0	74.0	220.5	90.3	111.0	140.6	140.0	180.0	117.0	145.7	63.1	35.7	49.4
40	IC095288	21.8	13.3	17.6	96.0	82.0		89.0	278.4	100.7		189.5	148.0	173.0		160.5	65.5	37.6	51.6
41	IC095291	21.9	11.0	16.5	96.0	67.0		81.5	260.5	92.4		176.5	140.0	175.0		157.5	72.9	38.6	55.7
42	IC095301	23.0	10.0	16.5	94.0	77.0	60.0	77.0	239.4	87.7	106.0	144.4	146.0	173.0	119.0	146.0	59.8	33.7	46.7
43	IC095302	21.8	11.0	16.4	94.0	67.0		80.5	246.8	97.0		171.9	140.0	175.0		157.5	64.6	29.7	47.1
44	IC095308	22.1	10.0	16.0	95.0	68.0		81.5	329.0	115.7		222.3	141.0	176.0		158.5	84.3	50.3	67.3
45	IC095314	22.8	11.0	16.9	96.0	72.0	74.0	80.7	287.6	111.0	118.0	172.2	140.0	177.0	116.0	144.3	72.4	50.7	61.5
46	IC095315	22.1	13.0	17.6	95.0	70.0	65.0	76.7	290.7	120.3	122.0	177.7	139.0	177.0	116.0	144.0	60.7	51.0	55.9
47	IC095320	26.1	11.7	18.9	85.0	67.0		76.0	291.5	94.3		192.9	142.0	177.0		159.5	70.4	48.7	59.5

S. No.	Accession No.	Seed yield /plant (g)			Shimla				Ranichauri						Palampur		
		Shimla	Ranichauri	Mean	Lateral spikelet length (cm)	Stem thickness (cm)	Petiole length (cm)	1000 seed weight (g)	Finger length (cm)	No. of finger /plant	Width of leaf (cm)	No. of leaves /plant	Plant girth at base (cm)	10 ml seed weight	No. of branches/ plant	Seed yields/plot (Kg)	Seed yield (q/ha)
24	IC038501	315.9	78.6	197.2	17.1	2.3	9.4	0.6	11.0	24.0	7.0	24.0	1.0	10.8	1.0	0.1	1.8
25	IC038542	280.2	81.4	180.8	18.9	2.1	10.0	0.6	13.0	26.3	7.7	24.0	1.0	10.0			
26	IC041765	418.3	92.7	255.5	12.4	2.4	8.2	0.6	8.0	24.0	8.0	19.3	1.0	11.3			
27	IC041766	257.3	71.1	164.2	11.6	2.0	10.8	0.7	12.5	20.7	8.7	25.3	1.0	12.1			
28	IC041769	295.4	82.4	188.9	17.2	2.3	9.2	0.6	8.7	23.7	7.7	27.7	1.0	10.9			
29	IC042006	377.9	90.7	234.3	13.2	2.3	10.4	0.7	11.0	21.0	5.7	21.0	0.9	11.1	1.0	0.2	6.5
30	IC042264-16	140.3	70.6	105.5	18.5	2.1	10.6	0.6	12.5	20.3	6.0	18.5	0.7	11.7	1.0	0.2	6.0
31	IC042265-2	430.5	89.7	260.1	20.2	2.5	9.5	0.7	7.8	23.0	7.0	21.0	1.0	12.4			
32	IC042265-3	150.7	92.1	121.4	14.9	1.8	16.6	0.7	9.0	21.7	7.0	22.7	0.9	11.1			
33	IC042284-5	455.2	82.0	268.6	12.0	2.4	11.0	0.6	11.5	20.7	6.7	21.7	0.5	11.7			
34	IC042290-17	320.4	86.5	203.4	15.8	2.0	10.1	0.7	9.6	23.3	7.0	24.0	0.5	10.8	2.0	0.2	5.3
35	IC042311-7	410.2	90.0	250.1	17.3	2.2	11.3	0.6	10.0	22.7	7.0	20.0	1.0	11.4			
36	IC095249	283.5	78.4	180.9	22.1	2.1	9.3	0.7	12.0	20.0	8.0	22.7	1.0	11.3			
37	IC095251	310.5	85.3	197.9	13.3	2.0	10.0	0.7	11.3	21.0	7.0	24.0	1.0	11.4	1.0	0.1	4.4
38	IC095253	330.0	88.5	209.2	13.7	1.6	11.2	0.6	10.7	22.0	6.0	22.7	1.0	11.0	2.0	0.2	6.0
39	IC095284	216.7	78.1	147.4	9.6	2.1	9.8	0.6	10.5	21.0	7.3	20.0	1.0	11.2	1.0	0.2	6.3
40	IC095288	190.8	92.7	141.8	13.3	2.1	10.6	0.6	10.0	24.0	6.0	18.3	0.9	12.0			
41	IC095291	300.1	67.0	183.5	16.2	2.0	11.3	0.6	11.8	21.7	6.7	24.0	0.5	12.1			
42	IC095301	280.1	74.2	177.1	16.5	1.8	12.6	0.6	11.0	18.7	5.0	25.5	1.0	11.4	1.0	0.2	6.0
43	IC095302	210.6	80.6	145.6	20.8	1.8	11.7	0.6	8.5	21.7	6.7	24.0	0.5	11.3			
44	IC095308	239.0	70.6	154.8	27.2	2.5	13.0	0.6	11.7	18.7	5.0	24.5	1.0	11.0			
45	IC095314	336.9	72.8	204.8	17.8	2.3	10.7	0.7	8.5	20.0	5.0	20.0	0.5	11.6	1.0	0.1	2.7
46	IC095315	252.2	60.1	156.2	15.3	2.6	11.0	0.6	11.5	24.3	5.7	21.0	0.9	12.0	1.0	0.1	3.3
47	IC095320	216.2	50.0	133.1	16.7	1.7	11.9	0.7	13.0	21.0	5.7	22.5	0.5	11.6			

S. No.	Accession No.	Leaf length (cm)			Days to 50% flowering				Plant height (cm)				Days to maturity				Inflorescence length (cm)		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Palampur	Mean	Shimla	Ranichauri	Palampur	Mean	Ranichauri	Shimla	Palampur	Mean	Shimla	Ranichauri	Mean
48	IC095341	22.0	9.0	15.5	93.0	61.0	73.0	75.7	268.5	131.7	107.0	169.1	142.0	177.0	117.0	145.3	59.7	56.3	58.0
49	IC095353	23.4	12.0	17.7	91.0	67.0	61.0	73.0	239.5	95.7	134.0	156.4	140.0	178.0	117.0	145.0	67.8	44.3	56.1
50	IC095396	20.6	13.0	16.8	95.0	61.0		78.0	225.0	113.7		169.3	140.0	178.0		159.0	81.7	44.7	63.2
Means for check varieties																			
	IC035407						64.5	64.5			116.0	116.0			118.5	118.5			
	Annapurna	20.7	12.8	16.8	92.7	72.4	67.5	77.5	244.6	92.3	113.5	150.1	142.8	171.7	112.0	142.2	70.7	38.6	54.7
	PRA 1		11.9	11.9		69.8		69.8		86.8		86.8	139.2		139.2			35.2	35.2
	PRA-2	18.1	12.3	15.2	95.7	70.6	61.5	75.9	248.5	91.4	112.0	150.6	140.4	172.3	108.0	140.2	65.9	34.5	50.2
	PRA3						66.0	66.0			119.5	119.5			117.5	117.5			
	SUVARNA		12.6	12.6		50.4		50.4		92.2		92.2	122.0		122.0			36.0	36.0
	Minimum	17.9	8.0	11.9	69.0	50.4	59.0	50.4	184.5	56.7	106.0	86.8	122.0	127.0	108.0	117.5	42.9	20.0	35.2
	Maximum	26.1	18.7	19.8	97.0	82.0	74.0	89.0	329.0	131.7	140.0	222.3	148.0	180.0	119.0	161.5	100.1	56.3	70.5
	Mean	21.4	12.7	16.8	91.2	69.6	65.5	77.0	243.9	94.4	120.5	157.3	139.6	170.5	115.2	146.7	70.2	37.6	53.2
	SD	1.7	2.2	1.6	6.9	7.4	4.4	7.2	29.3	20.1	10.1	24.4	5.9	9.8	4.1	10.7	9.2	6.9	6.8
	CV (%)	8.0	17.1	9.3	7.6	10.7	6.6	9.3	12.0	21.3	8.4	15.5	4.2	5.7	3.6	7.3	13.1	18.2	12.8

S. No.	Accession No.	Seed yield /plant (g)			Shimla				Ranichauri						Palampur		
		Shimla	Ranichauri	Mean	Lateral spikelet length	Stem thickness (cm)	Petiole length (cm)	1000 seed wt. (g)	Finger length (cm)	No. of finger /plant	Width of leaf (cm)	No. of leaves /plant	Plant girth at base (cm)	10 ml seed (wt)	No. of branches/ plant	Seed yields/plot (Kg)	Seed yield (q/ha)
48	IC095341	410.3	66.2	238.2	14.2	2.5	11.0	0.8	18.0	14.0	3.7	16.7	0.9	11.3	1.0	0.2	5.3
49	IC095353	265.9	72.6	169.2	13.9	2.4	9.5	0.6	10.0	27.3	5.0	20.0	0.9	11.8	1.0	0.0	1.2
50	IC095396	340.0	70.1	205.1	17.4	2.0	10.2	0.6	11.5	17.7	6.7	18.3	0.9	12.0			
Means for check varieties																	
	IC035407														1.0	0.1	2.7
	Annapurna	390.5	103.7	247.1	17.5	2.4	9.9	0.6	10.4	23.7	6.3	21.1	1.0	11.5	1.5	0.1	3.3
	PRA 1		110.4	110.4					10.3	23.1	5.9	19.8	0.9	11.9			
	PRA-2	203.3	106.3	154.8	14.8	2.1	9.2	0.7	10.5	23.4	5.7	22.8	0.8	11.8	1.5	0.1	3.6
	PRA3														1.0	0.1	3.9
	SUVARNA		53.7	53.7					11.1	23.9	6.1	21.5	0.9	11.9			
	Minimum	108.2	20.4	53.7	5.8	1.5	7.7	0.4	6.5	14.0	3.5	15.0	0.5	10.0	1.0	0.0	1.0
	Maximum	474.0	110.4	278.1	27.2	2.6	16.6	0.8	18.0	33.3	10.0	31.0	1.3	12.4	2.0	0.3	9.0
	Mean	308.3	77.1	188.5	16.2	2.1	10.9	0.6	10.6	22.8	6.2	21.8	0.8	11.3	1.2	0.1	3.7
	SD	89.8	17.8	50.9	4.8	0.2	2.0	0.1	2.0	3.6	1.2	3.4	0.2	0.5	0.4	0.1	2.1
	CV (%)	29.1	23.0	27.0	29.7	11.4	18.5	11.6	19.1	15.9	20.1	15.7	27.8	4.7	31.0	58.3	58.3

Table 81: Characterization of germplasm lines in grain amaranth at Shimla – Hills (2005)

S. No.	Accession No.	Qualitative											
		Early plant vigour	Growth habit	Leaf colour	Infl. Colour	Infl. Compactness	Stem colour	Stem surface	Infl shape	Infl. Spinniness	Seed shattering	Seed transparency	Seed colour
1	IC021810	3	1	5	11	5	2	2	4	4	3	2	1
2	IC037145	3	1	5	11	5	2	2	4	4	3	1	1
3	IC037146	3	1	5	9	5	6	2	4	4	3	1	1
4	IC037147	3	1	5	11	5	2	2	4	4	3	1	1
5	IC037148	3	1	5	11	5	2	2	4	4	3	1	1
6	IC037149	3	1	5	6	5	2	2	4	4	3	1	1
7	IC037150	3	1	5	9	5	5	2	2	4	3	1	1
8	IC037151	3	1	5	11	5	2	2	4	4	3	1	1
9	IC037152	3	1	5	11	5	2	2	4	4	3	1	1
10	IC037153	3	1	5	11	5	2	2	4	4	3	1	1
11	IC037154	3	1	5	6	5	2	2	4	4	3	1	1
12	IC037155	3	1	5	11	5	2	2	4	4	3	1	1
13	IC037156	3	1	5	6	5	2	2	4	4	3	1	1
14	IC037158	3	1	5	11	5	2	2	4	4	3	1	1
15	IC037160	3	1	5	11	5	2	2	4	4	3	1	1
16	IC037314	3	1	5	9	5	6	2	4	4	3	1	1
17	IC037316	3	1	5	11	5	2	2	4	4	3	1	1
18	IC038119	3	1	5	9	5	5	2	2	4	3	1	1
19	IC038127	3	1	5	9	5	6	2	2	4	3	1	1
20	IC038312	3	1	5	9	5	2	2	2	4	3	1	1
21	IC038313	3	1	5	6	5	2	2	2	4	3	2	1
22	IC038474	3	1	5	11	5	2	2	4	4	3	2	1
23	IC038483	3	1	5	11	5	2	2	4	4	3	2	1

S. No.	Accession No.	Qualitative											
		Early plant vigour	Growth habit	Leaf colour	Infl. Colour	Infl. Compactness	Stem colour	Stem surface	Infl shape	Infl. Spinniness	Seed shattering	Seed transparency	Seed colour
24	IC038501	3	1	5	9	5	2	2	4	4	3	2	1
25	IC038542	3	1	5	11	5	2	2	4	4	3	2	1
26	IC041765	3	1	5	9	5	6	2	4	4	3	2	1
27	IC041766	3	1	5	11	5	2	2	4	4	3	1	1
28	IC041769	3	1	5	9	5	6	2	4	4	3	1	1
29	IC042006	3	1	5	11	5	2	2	4	4	3	1	1
30	IC042264-16	3	1	5	9	5	6	2	4	4	3	1	1
31	IC042265-2	3	1	5	9	5	2	2	4	4	3	1	1
32	IC042265-3	3	1	5	2	5	2	2	4	4	7	1	1
33	IC042284-5	3	1	5	9	5	6	2	4	4	3	1	1
34	IC042290-17	3	1	5	9	5	6	2	4	4	3	1	1
35	IC042311-7	3	1	5	9	5	6	2	4	4	3	1	1
36	IC095249	3	1	5	9	5	2	2	4	4	3	1	1
37	IC095251	3	1	5	11	5	2	2	4	4	3	2	1
38	IC095253	3	1	5	11	5	2	2	4	4	3	5	1
39	IC095284	3	1	5	11	5	2	2	4	4	3	2	1
40	IC095288	3	1	5	11	5	2	2	4	4	3	1	1
41	IC095291	3	1	5	11	5	2	2	4	4	3	1	1
42	IC095301	3	1	5	11	5	2	2	4	4	3	1	1
43	IC095302	3	1	5	11	5	2	2	4	4	3	1	1
44	IC095308	3	1	5	11	5	2	2	4	4	3	1	1
45	IC095314	3	1	5	11	5	2	2	4	4	3	2	1
46	IC095315	3	1	5	11	5	2	2	4	4	3	1	1
47	IC095320	3	1	5	9	5	6	2	4	4	3	1	1

S. No.	Accession No.	Qualitative											
		Early plant vigour	Growth habit	Leaf colour	Infl. Colour	Infl. Compactness	Stem colour	Stem surface	Infl shape	Infl. Spinniness	Seed shattering	Seed transparency	Seed colour
48	IC095341	3	1	5	11	5	2	2	4	4	3	1	1
49	IC095353	3	1	5	11	5	2	2	4	4	3	2	1
50	IC095396	3	1	5	9	5	6	2	4	4	3	1	1
Means for Check varieties													
PRA-2		3	1	5	11	5	2	2	4	4	3	1	1
Annapurna		3	1	5	11	5	2	2	3	2	3	1	1
Minimum		3	1	5	2	5	2	2	2	2	3	1	1
Maximum		3	1	5	11	5	6	2	4	4	7	5	1
Mean		3	1	5	10	5	3	2	4	4	3	1	1
SD		0	0	0	2	0	2	0	1	0	1	1	0
CV(%) Phenotypic		0	0	0	19	0	58	0	16	7	18	51	0

Qualitative Descriptors: Early plant vigour: 1-poor, 2-good, 3-very good; Plant growth habit: 1-erect, 2-spreading, 3-drooping, 99-others; Leaf colour: 1-yellow, 2-yellowish orange, 3-yellowish green, 4-orange, 5-green, 6-greenish orange, 7-pink, 8-pinkish green, 9-reddish yellow, 11-red, 12-dark red, 99-others; Inflorescence colour: 1-light yellow, 2-yellow, 3-yellowish orange, 4-yellowish green, 5-orange, 6-pink, 7-pinkish green, 8-purple, 9-red, 10-reddish green, 11-green, 99-others; Inflorescence compactness: 3-lax, 5-intermediate, 7-dense, 99-others; Stem colour: 1-yellow, 2-yellowish green, 3-orange, 4-pink, 5-red, 6-reddish green, 7-reddish orange, 99-others; Stem surface: 1-smooth, 2-ridged, 99-others; Inflorescence shape: 1-globose, 2-semi drooping, 3-completely drooping, 4-straight, 99-others; Inflorescence spinniness: 1-smooth (pubescent), 2-glabrous, 3-prickly, 4-spiny, 99-others; Seed shattering: 3-low (%), 5-intermediate (10-50%), 7-high (50%), 99-others; Seed transparency: 1-translucent, 2-opaque, 99-others; Seed colour: 1-white, 2-creamish, 3-pale yellow, 4-pink, 5-red, 6-brown, 7-black, 8-golden, 99-others.

Table 82. Promising lines in Buckwheat germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Ranichauri (Accessions 50)				
1.	Days to 50% flowering	26.0-60.0	No Accessions	VL-7 (26.4 days)
2.	Days to 80% maturity	64.0-122.0	No Accessions	VL-7 (64.0 days)
3.	Plant height (cm)	40.8-130.0	EC 272442, EC 323724 > (108.0 cm)	PRB-1 (108.74 cm)
4.	No. of primary branches	2.5-6.0	IC 258232, IC 381463, IC 341675, EC 213685, EC 323739, IC 329456, IC 341682 > (5.0)	Himpriya (4.44)
5.	No. of secondary branches	3.8-7.1	IC 382728, IC 258232, IC 381050, IC 274431, IC 382243, IC 341682, EC 213685, EC 323739, IC 278957, IC 382734, IC 341675, IC 341592 > (6.0)	PRB1 (5.64)
6.	No. of leaves per plant	16.0-40.8	IC 258232, IC 274438 > (35.0)	Himpriya (32.36)
7.	Plant girth at base (cm)	0.3-1.0	IC 341690, EC 58322, IC 274429, IC 341674, IC 311074 > (10.85 cm)	PRB-1 (0.79 cm)
8.	Seed yield per plant (g)	16.1-162.1	IC 341679, IC 274439, IC 274438, IC 382287, IC 341674, IC 274436 > (103.0 g)	PRB-1 (86.87 g)
Sangla (Accessions 50)				
1.	Days to flowering	53.0-85.0	IC341591, IC381120, IC381129 < (57.0 days)	PRB-1 (62 days)
2.	Days to maturity	86.0-137.0	IC381120, IC381129, IC381130, IC381077 < (92.0 cm)	PRB-1 (92 days)
3.	Plant height (cm)	49.2-174.6	IC341674, IC341682, IC341679, IC341675 > (140.0 cm)	Himpriya (129.6 cm)
4.	Yield per plant (g)	0.2-4.6	IC274439, EC323729, IC361035, IC274436 > (3.8 cm)	Himpriya (3.2 g)
5.	Grain yield (q/ha)	1.1-44.9	IC274424, IC274439, IC274436, IC274431, IC341593, IC382243, IC274438, EC323729, IC329456, IC361035, EC353724 > (16.0 q/ha)	Himpriya (13.17 q/ha)
6.	1000 seed weight (g)	13-48	IC274439, IC311074, IC341674, IC274431, IC361035, IC341690, IC381120, IC341594 > (42 g)	PRB-1 (34 g)

S.No.	Characters	Range	Promising lines	Highest value of best check
Shimla (Accessions 50)				
1.	Days to 50% flowering	44.0-67.0	IC258232, IC280394, IC381077, IC341591, IC274429, IC381047, IC381129, IC278957 < (48.0 days)	PRB-1 (54.0 days)
2.	Leaf length (cm)	4.8-10.9	IC382728, EC272442, IC274429, IC341675, EC323729, IC274424, IC258232, IC381463 > (9.5 cm)	Himpriya (8.60 cm)
3.	Leaf width (cm)	5.1-14.4	IC341675, IC382287, EC272442 > (12.0 cm)	Himpriya (10.22 cm)
4.	No. of leaves	9.5-20.0	IC382287, IC280349, IC381074, IC341635, IC274439 > (18.0)	PRB-1 (15.75)
5.	No. of internodes	10.5-20.0	IC382287, IC341635, IC280349, IC381074, IC274439, IC341674 > (17.50)	PRB-1 (16.0 days)
6.	Petiole length (cm)	4.0-13.7	IC382728, IC341635, IC274429, IC382287 > (12.0 cm)	Himpriya (11.87 cm)
7.	No. of primary branches	2.0-6.5	IC274429, IC274438, IC274431, IC274436, IC310045, IC274424, IC341674, IC341682 > (4.50)	Himpriya (4.00)
8.	No. of inflorescence per plant	16.5-50.0	IC258232, IC280349, IC381077, EC323724, IC381074, IC274429, IC278957, IC329456, IC310045, IC341675, IC382728, EC272442, IC329593 > (32.0)	Himpriya (25.0)
9.	Length of cyme (cm)	2.4-12.0	EC213685, EC125357, IC274424 > (10.0 cm)	PRB-1 (8.50 cm)
10.	Plant height (cm)	43.5-185.6	IC341635, EC323724, EC272442, EC159500, IC381077, IC258232, IC280349, IC278957, IC310104, IC274424, IC274429, IC382728, IC382733, EC323729, EC125357, IC341674, IC382734, EC213685, IC381074, IC310045 > (115.0 cm)	Himpriya (93.70 cm)
11.	Yield per plant (g)	9.7-171.1	IC258232, IC329456 > (27.56 g)	PRB-1 (27.56 g)
12.	1000 seed weight (g)	12.2-30.0	EC323724, IC280349, EC323729, IC329593, IC274429, EC272442, IC382733, IC381077, EC213685, EC125357 > (23.0 g)	PRB-1 (21.4 g)
Shillong (Accessions 95)				
1.	Plant height (cm)	42.0-129.7	IC-521302, RESHAWAT, DRLT-1133, IC-274040, DRLT-1237 > (108.0 cm)	
2.	No. of branches per plant (g)	2.0-7.7	DRLT-1220, DRLT-1193, IC-412722, IC-421602, IC-521296 > (6.0)	

S.No.	Characters	Range	Promising lines	Highest value of best check
3.	100 seed weight (g)	0.9-3.0	IC-291623, IC-521295, IC-211622, IC-018889, IC-363951 > (2.8 g)	
4.	Days to maturity	62.0-101.0	IC-324244, IC-319595, IC-521295, IC-310581 < (62.0 days)	
5.	Fresh biomass weight (g)	20.0-1425.0	IC-394344, Kabra-3, IC-324244, IC-412863, RLT-1133 > (1100.00 g)	
Best entries over locations (Ranichauri, Shimla and Sangla)				
1.	Days to 50% flowering	26.4-67.6	No Accessions	VL-7 (26.4 days)
2.	Plant height (cm)	61.5-134.9	IC341674, EC272442, IC341635, EC323724, EC159500, IC382728, IC381077, EC213685, IC 274429, IC310104 > (113.50 cm)	Himpriya (103.4 cm)
3.	Number of primary branches	2.5-5.3	IC 274429, IC 258232, IC 274431, IC341682, IC 274438 > (5.0)	Himpriya (4.2)
4.	Number of leaves per plant	11.0-27.7	IC 258232, IC 274438, IC381050, IC341674, IC341675, IC310104, IC382728, IC382287 > (23.0)	Himpriya (23.2)
5.	Yield per plant (g)	5.5-85.8	IC 258232, IC329456 > (14.0 g)	Himpriya (14.2 g)
6.	1000 seed weight (g)	8.5-33.3	EC323724, IC329593, IC280349, EC323729, IC 274429, IC381077, EC272442, EC213685 > (13.0 g)	PRB-1 (27.7 g)

Table 83: Multilocation evaluation of germplasm lines in Buckwheat at Shimla, Ranichauri and Sangla – Hills (2005)

s. No.	Accession No.	Days to 50% flowering				Days to 80% maturity				Plant height (cm)				Number of primary branches			Number of leaves per plant			Yield per plant (g)			1000 Seed weight (g)		
		Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Mean	Ranichauri	Shimla	Mean	Shimla	Sangla	Mean	Shimla	Sangla	Mean
1	EC058322	32	53	69	51.3	80.0	105.0	130.0	105.0	103.0	103.2	76.4	94.2	5.0	3.5	4.3	26.5	14.5	20.5	16.3	1.8	9.0	21.4	22	21.7
2	EC125357	32	53	59	48.0	81.0	134.0	112.0	109.0	96.2	126.5	88.4	103.7	4.1	3.5	3.8	21.8	16.5	19.2	17.9	0.6	9.3	23.2	26	24.6
3	EC159500	30	52	58	46.7	82.0	129.0	112.0	107.7	96.5	149.5	116.4	120.8	4.3	3.5	3.9	22.5	16.5	19.5	16.2	0.6	8.4	19.3	34	26.6
4	EC213685	32	59	67	52.7	84.0	134.0	132.0	116.7	100.3	124.5	121.4	115.4	5.1	3.0	4.1	26.5	15.5	21.0	12.9	1.6	7.2	23.4	28	25.7
5	EC272442	30	57	62	49.7	82.0	134.0	109.0	108.3	130.0	150.4	101.6	127.3	3.8	4.0	3.9	28.0	17.0	22.5	16.3	4.5	10.4	24.0	22	23.0
6	EC323724	37	58	67	54.0	94.0	134.0	132.0	120.0	113.9	150.6	104.8	123.1	4.8	4.0	4.4	34.2	13.5	23.8	19.2	2.0	10.6	30.0	20	16.0
7	EC323729	33	51	67	50.3	85.0	134.0	104.0	107.7	92.7	128.2	90.4	103.7	5.1	3.0	4.1	24.2	15.0	19.6	17.0	0.8	8.9	24.8	26	25.4
8	IC 258232	27	44	59	43.3	70.0	104.0	111.0	95.0	106.0	144.8	90.2	113.7	6.0	4.5	5.3	40.8	14.5	27.7	171.1	0.4	85.8	21.4	3	12.2
9	IC 274424	47	57	67	57.0	100.0	98.0	107.0	101.7	79.5	130.3	110.2	106.7	3.1	5.0	4.1	21.4	15.0	18.2	19.6	1.2	10.4	22.0	35	28.5
10	IC 274429	42	46	63	50.3	96.0	104.0	132.0	110.7	102.3	129.0	114	115.1	4.0	6.5	5.3	25.0	17.5	21.3	18.9	0.8	9.9	24.0	32	28.0
11	IC 274431	47	61	66	58.0	105.0	98.0	116.0	106.3	92.5	108.4	119.2	106.7	4.5	6.0	5.3	24.7	16.5	20.6	15.8	3.4	9.6	20.8	42	31.4
12	IC 274436	52	57	68	59.0	114.0	98.0	112.0	108.0	82.8	108.3	98.6	96.6	3.0	5.5	4.3	26.0	13.5	19.8	21.3	3.8	12.5	20.6	36	28.3
13	IC 274438	52	61	71	61.3	116.0	104.0	117.0	112.3	90.3	106.7	102.2	99.7	3.6	6.5	5.1	36.2	16.5	26.3	20.3	2.2	11.2	20.4	36	28.2
14	IC274439	57	62	80	66.3	121.0	104.0	136.0	120.3	84.0	104.5	115.6	101.4	2.8	4.0	3.4	25.0	18.5	21.8	22.4	4.6	13.5	18.6	48	33.3
15	IC278957	30	47	66	47.7	78.0	104.0	110.0	97.3	92.7	140.4	66.2	99.8	3.1	4.5	3.8	20.0	17.0	18.5	12.8	0.2	6.5	20.8	28	24.4
16	IC280349	30	49	63	47.3	75.0	98.0	110.0	94.3	95.0	140.5	76.4	104.0	4.0	3.5	3.8	28.0	19.5	23.8	15.3	0.8	8.0	25.0	26	25.5
17	IC280394		45	70	57.5		88.0	108.0	98.0		76.5	49.2	62.9		3.5	3.5		16.5	16.5	10.4	1.6	6.0	14.8	35	24.9
18	IC310045	52	62	70	61.3	110.0	104.0	115.0	109.7	64.2	115.6	114	97.9	3.3	5.5	4.4	19.0	16.5	17.8	19.3	2.8	11.0	19.0	36	27.5
19	IC310095	46	63	71	60.0	98.0	98.0	111.0	102.3	70.0	108.6	115.2	97.9	2.5	3.5	3.0	23.3	16.0	19.7	21.3	1.2	11.2	19.6	38	28.8
20	IC310104	42	52	70	54.7	95.0	105.0	119.0	106.3	90.8	135.6	117.2	114.5	4.5	4.5	4.5	31.5	17.5	24.5	21.7	0.8	11.3	22.4	19	20.7

S. No.	Accession No.	Ranichauri			Shimla										Sangla
		No. of secondary branch	Plant girth at base (cm)	Seed yield/plant (g)	Leaf length (cm)	Leaf width (cm)	No. of internodes	Petiole length (cm)	No. of infl./plant	Length of cyme (cm)	Yield/plant (g)	No. of seed / infl.	1000 seed weight (g)	Grain Yield (q/ha)	
1	EC058322	6.0	1.0	37.0	9.4	7.6	15.5	10.2	29.0	7.9	16.3	4.0	21.4	14.3	
2	EC125357	5.7	0.5	55.4	8.7	7.8	16.5	8.1	27.5	10.3	17.9	5.0	23.2	3.6	
3	EC159500	5.0	0.5	25.5	8.5	7.8	16.5	5.7	23.5	7.9	16.2	5.0	19.3	3.8	
4	EC213685	6.4	0.7	46.7	7.7	7.2	16.0	7.3	30.5	12.0	12.9	5.0	23.4	8.3	
5	EC272442	4.8	0.9	40.0	10.9	12.1	17.5	11.7	32.5	8.0	16.3	6.0	24.0	19.5	
6	EC323724	5.1	0.3	39.4	9.4	9.9	14.5	8.8	37.5	6.3	19.2	5.0	30.0	16.1	
7	EC323729	6.4	0.5	22.8	10.6	8.8	15.0	11.2	23.5	5.5	17.0	4.0	24.8	7.3	
8	IC258232	6.8	0.5	30.5	9.9	8.3	15.0	6.7	50.0	5.3	171.1	4.0	21.4	2.5	
9	IC274424	5.0	0.8	48.8	10.0	10.9	14.5	11.8	27.0	10.1	19.6	5.0	22.0	44.9	
10	IC274429	5.5	1.0	63.6	10.8	8.3	17.5	13.1	36.0	7.1	18.9	4.0	24.0	4.1	
11	IC274431	6.8	0.5	46.4	5.8	6.7	17.5	8.0	29.0	4.8	15.8	5.0	20.8	24.7	
12	IC274436	4.7	0.6	108.8	8.0	8.8	14.5	10.9	27.0	5.6	21.3	5.0	20.6	27.9	
13	IC274438	4.8	0.8	152.5	8.8	11.1	16.5	7.8	24.5	6.8	20.3	5.0	20.4	19.6	
14	IC274439	4.5	0.5	155.2	6.2	7.1	18.0	8.0	29.0	3.8	22.4	6.0	18.6	36.2	
15	IC278957	6.4	0.5	42.5	7.4	6.6	16.5	5.7	35.0	7.1	12.8	4.0	20.8	1.6	
16	IC280349	5.8	0.8	50.0	8.5	8.8	18.5	8.0	40.0	6.7	15.3	4.0	25.0	5.5	
17	IC280394				7.2	8.1	16.5	7.7	30.0	7.4	10.4	4.0	14.8	10.0	
18	IC310045	4.8	0.8	36.5	8.2	9.5	17.0	9.5	33.0	4.8	19.3	6.0	19.0	8.2	
19	IC310095	4.0	0.7	45.8	9.0	11.2	16.5	10.8	30.0	4.6	21.3	5.0	19.6	8.3	
20	IC310104	5.8	0.5	39.0	8.3	9.2	17.5	10.9	27.5	5.4	21.7	4.0	22.4	5.7	

s. No.	Accession No.	Days to 50% flowering				Days to 80% maturity				Plant height (cm)				Number of primary branches			Number of leaves per plant			Yield per plant (g)			1000 Seed weight (g)		
		Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Mean	Ranichauri	Shimla	Mean	Shimla	Sangla	Mean	Shimla	Sangla	Mean
21	IC329456	57	63	68	62.7	118.0	106.0	116.0	113.3	88.5	89.4	123.2	100.4	5.1	4.5	4.8	24.0	16.0	20.0	28.9	2.4	15.6	14.0	45	29.5
22	IC329593	32	51	74	52.3	88.0	95.0	134.0	105.7	92.5	96.4	114.2	101.0	3.3	3.5	3.4	26.0	16.0	21.0	12.3	2.6	7.4	24.2	37	30.6
23	IC341581	42	49	66	52.3	92.0	95.0	118.0	101.7	40.9	61.2	94.2	65.4	4.8	4.0	4.4	18.5	9.5	14.0	15.0	0.8	7.9	14.2	34	24.1
24	IC341591	37	46	65	49.3	91.0	95.0	117.0	101.0	70.0	73.5	75.6	73.0	3.8	3.0	3.4	20.0	14.5	17.3	16.1	0.8	8.4	16.0	30	9.5
25	IC341592	47	59	53	53.0	100.0	98.0	106.0	101.3	94.5	80.7	82.6	85.9	4.6	4.0	4.3	30.7	16.0	23.3	26.7	0.4	13.6	19.6	22	20.8
26	IC341593	55	59	68	60.7	114.0	95.0	119.0	109.3	45.3	76.0	117.6	79.6	2.5	3.0	2.8	16.0	15.5	15.8	16.8	2.9	9.8	15.4	34	24.7
27	IC341594	37	49	78	54.7	92.0	96.0	130.0	106.0	48.5	94.7	132.6	91.9	4.0	3.5	3.8	20.2	14.5	17.3	18.1	2.6	10.4	12.6	36	24.3
28	IC341635	37	52	66	51.7	94.0	104.0	118.0	105.3	61.5	185.6	129.6	125.6	2.8	4.0	3.4	19.0	18.5	18.8	22.1	1.8	11.9	18.2	42	30.1
29	IC341674	52	64	72	62.7	114.0	104.0	135.0	117.7	104.5	125.6	174.6	134.9	4.5	5.0	4.8	31.5	18.0	24.8	15.3	2	8.6	17.0	45	31.0
30	IC341675	52	65	77	64.7	115.0	104.0	135.0	118.0	102.0	98.2	140.2	113.5	5.2	4.5	4.9	35.0	14.0	24.5	21.9	2.4	12.1	19.0	4	11.5
31	IC341679	57	62	77	65.3	119.0	117.0	137.0	124.3	71.8	109.7	146.8	109.4	4.5	4.0	4.3	20.5	15.5	18.0	22.9	0.8	11.8	16.0	40	10.0
32	IC341682	60	63	72	65.0	120.0	117.0	126.0	121.0	78.0	100.7	154.0	110.9	5.1	5.0	5.1	25.0	16.0	20.5	24.3	1.8	13.0	18.0	24	21.0
33	IC361874	52	61	68	60.3	114.0	117.0	122.0	117.7	80.2	81.3	129.2	96.9	4.1	3.5	3.8	25.5	14.0	19.8	15.3	1.6	8.4	19.0	42	30.5
34	IC381047	42	46	79	55.7	97.0	117.0	123.0	112.3	72.0	59.3	126.0	85.8	4.0	3.0	3.5	18.5	11.5	15.0	19.8	3.8	11.8	14.8	42	28.4
35	IC381050	52	61	68	60.3	113.0	105.0	123.0	113.7	97.8	94.7	114.8	102.4	5.0	4.0	4.5	34.6	17.5	26.1	22.4	2.2	12.3	17.4	13	15.2
36	IC381074	27	48	59	44.7	70.0	105.0	112.0	95.7	74.3	123.6	74.8	90.9	3.8	3.0	3.4	21.0	19.0	20.0	18.1	0.4	9.3	21.8	4	12.9
37	IC381077	28	45	62	45.0	72.0	105.0	119.0	98.7	85.1	146.5	116.4	116.0	3.0	3.0	3.0	20.0	15.5	17.8	16.2	1.2	8.7	23.4	38	30.7
38	IC381098	32	63	57	50.7	84.0	135.0	88.0	102.3	95.8	87.4	94	92.4	3.8	3.5	3.7	32.5	14.5	23.5	25.8	0.2	13.0	20.0	24	22.0
39	IC381120		51	59	55.0		138.0	96.0	117.0		43.5	79.4	61.5		3.5	3.5		11.0	11.0	10.8	0.2	5.5	12.2	22	17.1
40	IC381129		47	55	51.0		140.0	86.0	113.0		51.0	85.2	68.1		3.0	3.0		14.0	14.0	9.7	1.6	5.7	16.0	42	29.0
41	IC381130		49	55	52.0		98.0	87.0	92.5		52.2	89.2	70.7		2.5	2.5		15.0	15.0	14.6	1.6	8.1	13.2	32	22.6
42	IC381177	47	55	58	53.3	97.0	133.0	87.0	105.7	40.8	70.0	76.2	62.3	3.1	3.0	3.1	20.3	16.5	18.4	16.3	0.6	8.4	14.4	30	8.7

S. No.	Accession No.	Ranichauri			Shimla										Sangla
		No. of secondary branch	Plant girth at base (cm)	Seed yield/plant (g)	Leaf length (cm)	Leaf width (cm)	No. of internodes	Petiole length (cm)	No. of infl./plant	Length of cyme (cm)	Yield/plant (g)	No. of seed / infl.	1000 seed weight (g)	Grain Yield (q/ha)	
21	IC329456	6.0	0.8	83.0	7.8	8.5	15.5	6.8	34.5	4.5	28.9	5.0	14.0	15.4	
22	IC329593	5.5	0.7	33.2	8.0	7.3	16.0	5.8	32.5	3.8	12.3	5.0	24.2	18.6	
23	IC341581	5.8	0.7	50.7	6.1	6.9	10.5	5.3	30.5	3.7	15.0	5.0	14.2	3.5	
24	IC341591	4.3	0.5	25.2	5.3	6.0	15.0	5.7	31.0	3.7	16.1	6.0	16.0	3.1	
25	IC341592	6.2	0.5	20.1	7.4	8.7	16.0	5.8	29.0	3.6	26.7	6.0	19.6	1.3	
26	IC341593	3.8	0.9	30.0	6.3	7.9	15.0	7.7	29.5	2.7	16.8	4.0	15.4	12.3	
27	IC341594	5.6	0.5	40.1	5.8	7.0	15.5	7.5	29.5	4.4	18.1	5.0	12.6	21.8	
28	IC341635	4.0	0.6	18.7	8.1	9.9	19.0	13.2	25.0	6.7	22.1	5.0	18.2	6.7	
29	IC341674	6.0	1.0	124.7	7.8	10.1	18.0	7.8	26.0	5.0	15.3	6.0	17.0	13.9	
30	IC341675	6.2	0.5	98.1	10.8	14.4	14.5	11.0	33.0	6.3	21.9	6.0	19.0	14.4	
31	IC341679	5.1	0.8	162.1	8.3	9.4	15.0	8.5	24.0	3.7	22.9	6.0	16.0	4.3	
32	IC341682	6.5	0.7	35.1	9.5	10.5	17.0	7.0	31.0	4.5	24.3	6.0	18.0	11.5	
33	IC361874	5.5	0.5	41.8	7.5	8.4	14.0	4.0	30.0	3.9	15.3	5.0	19.0	11.1	
34	IC381047	5.6	0.5	21.7	5.7	7.5	11.5	6.0	32.0	3.4	19.8	6.0	14.8	17.1	
35	IC381050	6.8	0.9	58.7	6.7	7.4	17.5	10.1	24.0	4.6	22.4	5.0	17.4	8.4	
36	IC381074	5.0	0.9	50.0	8.7	7.5	18.5	7.9	37.0	7.7	18.1	4.0	21.8	2.4	
37	IC381077	4.5	0.5	16.1	6.7	7.5	15.0	10.7	39.0	5.7	16.2	5.0	23.4	7.6	
38	IC381098	5.0	0.7	40.9	8.0	8.1	14.0	8.2	23.5	3.9	25.8	6.0	20.0	1.5	
39	IC381120				5.6	5.1	12.0	4.5	16.5	4.4	10.8	4.0	12.2	1.1	
40	IC381129				5.8	7.0	14.5	5.8	20.0	2.4	9.7	4.0	16.0	9.8	
41	IC381130				4.8	7.5	15.0	7.1	27.0	3.5	14.6	4.0	13.2	10.3	
42	IC381177	5.2	0.5	18.3	6.9	7.8	16.5	8.6	32.0	4.1	16.3	4.0	14.4	4.3	

s. No.	Accession No.	Days to 50% flowering				Days to 80% maturity				Plant height (cm)				Number of primary branches			Number of leaves per plant			Yield per plant (g)			1000 Seed weight (g)		
		Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Sangla	Mean	Ranichauri	Shimla	Mean	Ranichauri	Shimla	Mean	Shimla	Sangla	Mean	Shimla	Sangla	Mean
43	IC381463	46	59	68	57.7	95.0	107.0	106.0	102.7	62.0	105.2	84.2	83.8	5.6	4.0	4.8	25.0	18.0	21.5	17.6	0.8	9.2	15.6	37.8	26.3
44	IC382243	52	60	58	56.7	108.0	105.0	96.0	103.0	80.5	95.0	72.4	82.6	4.8	4.0	4.4	24.5	14.5	19.5	18.7	1.8	10.3	17.4	40	10.7
45	IC382270	50	62	75	62.3	105.0	98.0	119.0	107.3	57.6	85.3	116.8	86.6	3.1	4.0	3.6	18.8	18.0	18.4	19.2	2.2	10.7	17.0	35	26.0
46	IC382287	57	67	69	64.3	116.0	135.0	109.0	120.0	62.5	97.5	102.1	87.4	3.5	4.0	3.8	28.0	20.0	24.0	21.9	2	11.9	13.0	40	8.5
47	IC382728	30	51	83	54.7	76.0	105.0	136.0	105.7	108.0	128.7	119.8	118.8	5.0	4.5	4.8	31.0	17.5	24.3	24.1	1.8	12.9	17.4	30	10.2
48	IC382733	27	49	67	47.7	78.0	105.0	136.0	106.3	80.5	128.5	86.8	98.6	3.0	2.0	2.5	18.0	13.0	15.5	13.2	1.6	7.4	23.6	18	20.8
49	IC382734	28	51	67	48.7	78.0	134.0	132.0	114.7	90.4	125.0	86.6	100.7	4.3	3.0	3.7	25.5	16.0	20.8	11.0	2.0	6.5	22.4	35	28.7
50	IC391690	60	52	59	57.0	122.0	105.0	94.0	107.0	98.0	107.6	86.6	97.4	3.8	4.0	3.9	30.0	14.5	22.3	19.7	0.6	10.1	22.6	28	25.3
Means for Check varieties																									
HIMPRIYA		55	63	85	67.6	114.8	134.5	133.5	127.6	86.9	93.7	129.6	103.4	4.4	4.0	4.2	32.4	14.0	23.2	25.2	3.2	14.2	21.4	27.5	24.5
PRB 1		42	54	62	52.8	102.0	119.5	92.0	104.5	108.7	92.1	94	98.3	4.2	4.0	4.1	30.1	15.8	22.9	27.6	0.2	13.9	21.4	34	27.7
VL 7		26			26.4	64.0			64.0	74.4			74.4	3.4		3.4	19.9		19.9						
Minimum		26	44	53	26.4	64.0	88.0	86.0	64.0	40.8	43.5	49.2	61.5	2.5	2.0	2.5	16.0	9.5	11.0	9.7	0.2	5.5	12.2	13	8.5
Maximum		60	67	85	67.6	122.0	140.0	137.0	127.6	130.0	185.6	174.6	134.9	6.0	6.5	5.3	40.8	20.0	27.7	171.1	4.6	85.8	30.0	48	33.3
Mean		42	55	67	54.6	96.5	111.1	115.8	107.4	84.4	106.6	104.6	97.6	4.1	3.9	4.0	25.4	15.7	20.2	21.4	1.7	11.5	19.3	33	23.0
SD		11	6	7	7.3	16.3	15.0	14.5	10.0	19.3	29.6	24.2	17.6	0.9	0.9	0.7	5.6	2.1	3.5	21.6	1.1	10.8	3.9	8	6.9
CV%		26	12	11	13.4	16.9	13.5	12.5	9.3	22.9	27.7	23.1	18.0	21.0	23.6	17.5	22.2	13.1	17.1	101.1	66.6	93.2	20.0	24.4	30.2

S. No.	Accession No.	Ranichauri			Shimla									Sangla
		No. of secondary branch	Plant girth at base (cm)	Seed yield/plant (g)	Leaf length (cm)	Leaf width (cm)	No. of internodes	Petiole length (cm)	No. of infl./plant	Length of cyme (cm)	Yield/plant (g)	No. of seed / infl.	1000 seed weight (g)	Grain Yield (q/ha)
43	IC381463	6.0	0.9	31.9	9.7	11.7	17.5	6.5	26.5	4.5	17.6	5.0	15.6	6.2
44	IC382243	6.7	0.7	40.0	8.0	10.6	15.0	8.0	19.0	9.3	18.7	4.0	17.4	12.8
45	IC382270	4.1	0.5	48.7	6.6	8.2	17.5	7.0	20.5	5.1	19.2	5.0	17.0	19.6
46	IC382287	5.4	0.5	140.0	9.5	13.3	20.0	12.1	25.0	4.9	21.9	5.0	13.0	13.5
47	IC382728	7.1	0.9	47.7	10.9	11.4	17.0	13.7	32.5	7.3	24.1	2.0	17.4	14.5
48	IC382733	5.0	0.7	25.5	7.0	9.3	13.0	7.1	32.0	4.5	13.2	4.0	23.6	13.2
49	IC382734	6.3	0.5	30.0	7.7	8.5	15.5	5.6	26.5	5.4	11.0	3.0	22.4	12.9
50	IC391690	4.9	1.0	57.2	8.5	9.3	14.5	7.9	25.0	7.4	19.7	5.0	22.6	2.9
Means for Check varieties														
	Himpriya	5.5	0.8	60.1	8.6	10.2	13.8	11.9	25.0	4.3	25.2	6.0	21.4	13.2
	PRB-1	5.6	0.8	86.9	6.8	7.7	16.0	10.0	23.3	8.5	27.6	4.5	21.4	1.5
	VL-7	4.7	0.7	28.9										
	Minimum	3.8	0.3	16.1	4.8	5.1	10.5	4.0	16.5	2.4	9.7	2.0	12.2	1.1
	Maximum	7.1	1.0	162.1	10.9	14.4	20.0	13.7	50.0	12.0	171.1	6.0	30.0	44.9
	Mean	5.5	0.7	54.1	7.9	8.8	15.8	8.4	29.1	5.6	21.4	4.8	19.3	11.2
	SD	0.8	0.2	37.3	1.6	1.8	1.9	2.4	5.8	2.1	21.6	0.9	3.9	8.8
	CV%	15.1	25.9	68.9	19.8	21.0	11.7	28.6	20.0	36.4	101.1	18.3	20.0	79.0

Table 84: Characterization of germplasm lines in Buckwheat at Shimla – Hills (2005)

S. No.	Accession No.	Qualitative										
		Plant vigour	Growth Habit	Plant colour	Leaf colour	Leaf margin colour	Leaf blade shape	Seed colour	Seed shattering	No. of seed / infl.	Seed shape	Seed colour
1	IC258232	3	3	1	3	5	2	5	3	4	2	5
2	IC274424	3	3	1	3	5	2	5	3	5	3	3
3	IC274429	3	3	1	3	5	2	5	3	4	2	5
4	IC274431	3	3	1	3	5	2	5	3	5	2	3
5	IC274436	3	3	1	3	5	2	5	3	5	3	5
6	IC274438	3	3	1	3	5	2	7	3	5	1	5
7	IC274439	3	3	1	3	5	2	3	3	6	2	3
8	IC278957	3	3	5	3	3	2	3	3	4	1	5
9	IC280349	3	3	5	3	5	2	5	3	4	1	5
10	IC280394	3	3	1	3	5	2	5	3	4	3	7
11	IC310045	3	3	5	3	5	2	7	3	6	2	5
12	Himpriya	3	3	1	3	5	2	7	3	6	3	7
13	PRB-1	3	3	1	3	5	2	7	3	4	2	5
14	IC310095	3	3	5	3	5	2	7	3	5	2	1
15	IC310104	3	3	5	3	5	2	5	3	4	2	5
16	IC329456	3	3	1	3	3	2	7	3	5	1	7
17	IC329593	3	3	5	3	5	2	7	3	5	2	5
18	IC341581	3	3	1	3	5	2	5	3	5	3	5
19	IC341591	3	3	1	3	5	2	5	3	6	2	7
20	IC341592	3	3	1	3	5	2	5	3	6	2	5

S. No.	Accession No.	Qualitative										
		Plant vigour	Growth Habit	Plant colour	Leaf colour	Leaf margin colour	Leaf blade shape	Seed colour	Seed shattering	No. of seed / infl.	Seed shape	Seed colour
21	IC341593	3	3	1	3	5	2	7	3	4	1	5
22	IC341594	3	3	1	3	5	2	5	3	5	2	5
23	IC341635	3	3	1	3	5	2	5	3	5	1	5
24	IC341674	3	3	1	3	5	2	7	3	6	2	3
25	IC341675	3	3	1	3	5	2	5	3	6	2	5
26	IC341679	3	3	1	3	5	2	7	3	6	1	7
27	IC341682	3	3	1	3	5	2	5	3	6	1	7
28	IC361874	3	3	1	3	5	2	3	3	5	2	3
29	IC381047	3	3	1	3	5	2	3	3	6	2	3
30	IC381050	3	3	1	3	5	2	5	3	5	3	5
31	IC381074	3	3	5	3	5	2	7	3	4	1	7
32	IC381077	3	3	5	3	5	2	3	3	5	2	5
33	IC381098	3	3	5	3	5	2	3	3	6	2	7
34	IC381120	3	3	1	3	5	2	7	3	4	1	5
35	IC381129	3	3	1	3	5	2	5	3	4	1	5
36	IC381130	3	3	1	3	5	2	3	3	4	2	5
37	IC381177	3	3	1	3	5	2	5	3	4	1	5
38	IC381463	3	3	1	3	5	2	5	3	5	3	7
39	IC382243	3	3	1	3	5	2	5	3	4	2	5
40	IC382270	3	3	1	3	5	2	5	3	5	2	3
41	IC382287	3	3	1	3	5	2	7	3	5	1	7
42	Himpriya	3	3	1	3	5	2	7	6	6	3	5

S. No.	Accession No.	Qualitative										
		Plant vigour	Growth Habit	Plant colour	Leaf colour	Leaf margin colour	Leaf blade shape	Seed colour	Seed shattering	No. of seed / infl.	Seed shape	Seed colour
43	PRB-1	3	3	5	3	5	2	7	5	5	2	5
44	IC382728	3	3	5	3	5	2	7	3	2	1	5
45	IC382733	3	3	5	3	5	2	5	3	4	1	5
46	IC382734	3	3	5	3	5	2	3	3	3	2	7
47	IC391690	3	3	5	3	5	2	5	3	5	1	5
48	EC58322	3	3	5	3	5	2	7	3	4	1	5
49	EC125357	3	3	5	3	5	2	7	3	5	2	5
50	EC159500	3	3	1	3	5	2	7	3	5	2	5
51	EC213685	3	3	5	3	5	2	7	5	5	2	5
52	EC272442	3	3	5	3	5	2	3	6	6	1	5
53	EC323724	3	3	5	3	5	2	3	5	5	1	5
54	EC323729	3	3	5	3	5	2	3	4	4	1	5

Qualitative Descriptors: Early plant vigour: 1-poor, 2-good, 3-very good; Plant growth habit: 3-erect, 5-semi-erect, 7-spreading, 99-others; Flower colour: 1-white, 3-greenish yellow, 5-pink, 7-red, 99-others; Leaf colour: 3- green, 5-pink, 7-red, 99-others; Leaf margin colour: 3-green, 5-pink, 7-red, 99-others; Leaf blade shape: 1-ovate, 2-hastate, 3-sagittate, 4-cordate, 99-others; Stem colour: 3-green, 5-pink, 7-red, 99-others; Seed shattering: 0-non-shattering, 3-low, 5-intermediate, 7-high, 99-others; Seed shape: 1-triangular, 2-ovate, 3-conoidal, 99-others; Seed colour: 3-grey, 5-brown, 7-black, 9-mottled, 99-others.

Table 85. Evaluation of gerplasm lines in Buckwheat, Shilong

Sl.No.	Accession No.	Plant stand	Plant ht. (cm)	No. of branches/plant(g)	Seed colour	100- seed weight (g)	Seed (q/ha)	Days of maturity	Fresh Biomass weight (g)
1	AKABRA-307	96.0	108.2	4.3	Black	2.2	8.8	62.0	1250.0
2	DRLT-1127	107.0	99.0	3.3	Black	2.2	6.3	69.0	625.0
3	DRLT-1133	123.0	115.3	2.6	Black	2.4	6.9	69.0	1175.0
4	DRLT-1156	44.0	72.5	5.0	Black	2.5	5.0	69.0	375.0
5	DRLT-1166	105.0	107.2	4.3	Black	2.0	9.4	74.0	375.0
6	DRLT-1193	47.0	65.8	7.7	Black	1.1	1.9	69.0	125.0
7	DRLT-1208	72.0	82.0	2.7	Black	2.3	5.0	70.0	200.0
8	DRLT-1220	71.0	93.0	7.7	Black	1.3	6.5	69.0	625.0
9	DRLT-1231	132.0	97.3	3.3	Black	1.9	10.0	74.0	400.0
10	DRLT-1237	155.0	108.9	3.3	Black	2.1	7.5	74.0	300.0
11	DRLT-1243	92.0	88.0	3.7	Black	2.4	3.8	69.0	500.0
12	EC-058322	77.0	86.3	3.0	Black	2.5	9.4	69.0	625.0
13	EC-213685	101.0	77.8	4.7	Black	2.2	5.6	63.0	400.0
14	EC-323724	95.0	96.0	5.7	Black	2.5	5.0	62.0	300.0
15	EC-323729	82.0	105.7	6.0	Black	2.7	6.3	62.0	550.0
16	IC-013141	93.0	103.0	4.3	Black	2.8	8.1	62.0	1000.0
17	IC-013145	101.0	105.0	4.7	Black	2.1	3.8	62.0	300.0
18	IC-013376	108.0	95.0	4.3	Black	2.2	6.3	62.0	625.0
19	IC-013411	99.0	102.3	5.3	Black	1.8	7.5	62.0	1025.0
20	IC-013751	120.0	96.7	5.3	Black	2.3	6.9	62.0	500.0
21	IC-018864	65.0	87.5	3.3	Black	2.0	6.9	63.0	600.0
22	IC-018869	94.0	83.3	3.7	Black	2.2	2.5	63.0	125.0
23	IC-018889	87.0	80.4	5.3	Black	2.9	3.1	62.0	250.0
24	IC-0323731	100.0	90.0	5.3	Black	2.1	4.4	62.0	600.0
25	IC-125357	121.0	70.7	3.7	Black	2.3	6.3	63.0	500.0
26	IC-188669	95.0	95.8	4.7	Black	2.4	6.3	62.0	690.0
27	IC-18889	105.0	86.0	3.7	Black	2.0	6.3	63.0	525.0

Sl.No.	Accession No.	Plant stand	Plant ht. (cm)	No. of branches/plant(g)	Seed colour	100- seed weight (g)	Seed (q/ha)	Days of maturity	Fresh Biomass weight (g)
28	IC-211622	95.0	99.0	5.0	Black	3.0	8.8	62.0	800.0
29	IC-274040	79.0	111.7	3.0	Black	2.2	5.0	63.0	400.0
30	IC-274423	155.0	89.0	5.7	Black	2.4	6.3	63.0	600.0
31	IC-274429	89.0	86.3	5.3	Black	2.0	4.5	63.0	500.0
32	IC-274435	129.0	78.3	4.0	Black	2.6	4.4	63.0	480.0
33	IC-291623	85.0	107.0	5.0	Black	3.0	5.0	62.0	500.0
34	IC-310046	79.0	99.2	2.7	Black	2.4	6.3	63.0	500.0
35	IC-310047	82.0	89.8	4.0	Black	2.5	5.0	63.0	325.0
36	IC-310104	70.0	89.7	5.3	Black	2.0	6.3	63.0	550.0
37	IC-310581	25.0	97.3	5.3	Black	2.4	9.4	62.0	1125.0
38	IC-313468	96.0	99.1	5.0	Black	2.1	5.0	63.0	425.0
39	IC-313470	90.0	82.3	4.0	Black	2.3	6.3	63.0	350.0
40	IC-319581A	65.0	98.7	4.3	Black	2.4	9.4	62.0	800.0
41	IC-319588	116.0	103.0	6.0	Black	1.4	6.3	62.0	750.0
42	IC-319595	87.0	99.0	5.6	Black	2.4	10.0	62.0	1050.0
43	IC-319637	73.0	92.7	5.0	Black	1.9	6.3	62.0	1125.0
44	IC-324244	90.0	91.5	4.3	Black	1.8	12.5	62.0	1200.0
45	IC-324261A	56.0	97.0	4.3	Black	2.3	5.0	62.0	500.0
46	IC-324313	112.0	97.3	4.3	Black	2.6	7.5	62.0	800.0
47	IC-330442	140.0	99.0	5.0	Black	2.1	6.8	62.0	775.0
48	IC-340274	84.0	97.7	4.3	Black	2.4	7.5	63.0	800.0
49	IC-340307	109.0	93.0	4.3	Black	2.4	8.1	63.0	1075.0
50	IC-340325	87.0	91.7	5.3	Black	2.2	6.3	63.0	750.0
51	IC-340361	110.0	97.3	6.0	Black	2.0	3.8	63.0	525.0
52	IC-340363	93.0	75.0	4.0	Black	1.9	2.5	63.0	200.0
53	IC-340367	107.0	83.7	5.0	Black	1.7	5.0	63.0	800.0
54	IC-363948	83.0	89.0	5.0	Black	2.7	2.5	63.0	100.0
55	IC-363951	70.0	100.3	4.7	Black	2.9	6.3	63.0	975.0
56	IC-363952	110.0	93.7	4.7	Black	2.8	6.3	63.0	500.0
57	IC-363973	116.0	60.0	3.7	Black	2.6	2.5	63.0	125.0

Sl.No.	Accession No.	Plant stand	Plant ht. (cm)	No. of branches/plant(g)	Seed colour	100- seed weight (g)	Seed (q/ha)	Days of maturity	Fresh Biomass weight (g)
58	IC-363995	93.0	94.7	4.7	Black	2.2	5.0	63.0	450.0
59	IC-384730	177.0	105.0	4.7	Black	1.9	7.5	70.0	625.0
60	IC-394186	122.0	100.4	5.7	Black	2.3	10.0	63.0	875.0
61	IC-394344	80.0	91.0	3.6	Black	2.5	7.5	63.0	1425.0
62	IC-394357	127.0	92.3	5.3	Black	1.8	7.5	63.0	800.0
63	IC-394880	134.0	98.5	4.7	Black	2.0	7.0	70.0	625.0
64	IC-394881	111.0	75.8	5.0	Black	2.0	3.8	63.0	300.0
65	IC-412722	38.0	62.8	7.3	Black	1.0	1.9	69.0	125.0
66	IC-412744	74.0	82.3	6.0	Black	0.9	3.8	69.0	300.0
67	IC-412863	44.0	80.7	6.7	Black	1.0	6.9	69.0	1200.0
68	IC-421597	79.0	80.7	4.7	Black	1.1	3.8	70.0	150.0
69	IC-421598	146.0	86.2	5.0	Black	1.5	7.5	70.0	300.0
70	IC-421599	12.0	60.6	4.0	Black	-	2.3	95.0	90.0
71	IC-421601	69.0	88.0	5.7	Black	1.4	7.5	95.0	300.0
72	IC-421602	2.0	84.0	7.0	Black	1.8	1.3	95.0	50.0
73	IC-421604	14.0	66.2	3.7	Black	-	1.8	95.0	70.0
74	IC-421605	5.0	42.0	4.0	Black	1.9	1.6	101.0	65.0
75	IC-421609	11.0	49.7	5.0	Black	1.4	0.5	95.0	20.0
76	IC-521294	110.0	86.2	4.3	Black	2.6	5.0	62.0	300.0
77	IC-521295	86.0	105.8	5.3	Black	3.0	9.4	62.0	900.0
78	IC-521296	84.0	83.8	6.7	Black	2.6	4.4	62.0	300.0
79	IC-521297	88.0	78.7	3.7	Black	2.8	3.8	62.0	150.0
80	IC-521298	75.0	86.0	5.3	Black	2.6	3.8	62.0	250.0
81	IC-521299	82.0	99.0	4.7	Black	2.6	6.3	62.0	800.0
82	IC-521301	76.0	101.7	5.3	Black	2.2	3.8	62.0	375.0
83	IC-521302	57.0	129.7	4.3	Black	2.6	5.0	62.0	425.0
84	IC-521303	105.0	97.0	5.0	Black	2.5	3.1	62.0	275.0
85	IC-521304	141.0	76.0	3.7	Black	2.2	3.1	63.0	150.0
86	IC-521305	118.0	71.0	3.3	Black	1.8	3.1	63.0	300.0
87	Kulugangri	83.0	94.0	4.3	Black	2.6	4.4	62.0	325.0

Sl.No.	Accession No.	Plant stand	Plant ht. (cm)	No. of branches/ plant(g)	Seed colour	100- seed weight (g)	Seed (q/ha)	Days of maturity	Fresh Biomass weight (g)
88	KUPPA-2	85.0	103.0	3.7	Black	2.3	6.3	69.0	625.0
89	ORUT-804	149.0	89.0	4.7	Black	2.0	4.5	70.0	600.0
90	PHESTRU	131.0	76.3	3.3	Black	2.4	6.3	63.0	625.0
91	RESHAWAT	97.0	117.0	4.3	Black	2.3	6.3	69.0	600.0
92	RS-DV-6	100.0	89.3	3.0	Black	2.2	3.8	69.0	600.0
93	SABRASH	101.0	89.7	5.7	Black	2.3	3.8	63.0	500.0
94	SS-DRLT-137	67.0	87.8	4.3	Black	1.6	3.1	70.0	750.0
95	SS-DRLT-195	1.0	83.5	2.0	Black	-	-	-	-
	Maximum	177.0	129.7	7.7		3.0	12.5	101.0	1425.0
	Minimum	1.0	42.0	2.0		0.9	0.5	62.0	20.0
	Mean	89.9	90.2	4.6		2.2	5.6	66.5	538.2
	SD	34.1	14.1	1.1		0.5	2.3	8.4	316.2
	CV%	37.9	15.6	23.4		20.9	41.1	12.7	58.8

Table 86. Promising lines in Chenopodium germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines
Shimla (Accessions 25)			
1.	Days to 50% flowering	68.0-100.0	IC415477, IC108816, IC328878, IC329185 < (80.0 days)
2.	Inflorescence length (cm)	45.10-65.50	IC109734, IC107295, IC328878, NIC22530, EC359447 > (56.0 cm)
3.	Leaf length (cm)	6.85-15.40	NIC22499, IC108816, IC328878, IC109734, EC359451 > (13.0 cm)
4.	Leaf width (cm)	3.85-16.05	IC108816, NIC22499, NUIC15022, EC359451, IC109734 > (12.0 cm)
5.	Plant height (cm)	27.90-270.40	IC343192, IC341698, IC107295, IC341710, IC328878 > (240.0 cm)
6.	Days to 80% maturity	118.25-162.0	IC415477, IC328878, IC328854, IC341698 < (140.0 days)
7.	Seed yield per plant (g)	15.00-177.36	IC415477, IC341710, IC415477, NUIC15022, NIC22530 > (83.0 g)
8.	1000 seed weight (g)	0.20-1.40	IC415477, NIC22499, EC359447, IC107299 > (0.75 g)

Table 87: Evaluation of germplasm lines in chenopodium at Shimla – Hills (2005)

S. No.	Accession No.	Quantitative							
		Days to 50% flowering	Inflorescence Length (cm)	Leaf length (cm)	Leaf width (cm)	Plant height (cm)	Days to 80% maturity	Seed yield/plant (g)	1000 seed weight (g)
1	NIC 22499	93.00	56.10	15.40	14.65	233.25	144.00	79.35	0.80
2	EC359447	98.00	56.60	10.25	10.00	238.60	162.00	70.67	0.80
3	IC107299	91.00	49.20	10.35	5.80	232.00	138.00	48.41	0.80
4	IC341710	92.00	53.00	11.65	9.10	259.75	138.00	152.85	0.60
5	EC359451	93.00	53.70	13.70	13.00	27.90	146.00	78.00	0.60
6	IC107185	92.00	51.00	10.30	8.55	231.30	138.00	66.10	0.60
7	IC341698	93.00	56.35	13.45	10.30	263.60	137.00	52.45	0.60
8	IC341708	93.00	45.10	6.85	3.85	234.70	138.00	46.40	0.60
9	IC329470	87.00	54.30	9.45	5.15	236.20	138.00	38.71	0.60
10	IC329494	98.00	51.05	13.05	8.10	207.20	138.00	38.28	0.60
11	IC328878	73.00	59.55	14.65	7.80	240.40	129.00	27.56	0.60
12	NUIC 15022	99.00	54.00	12.50	13.55	237.40	146.00	94.18	0.50
13	IC108088	100.00	45.50	10.10	12.00	148.35	145.00	31.50	0.50
14	IC108816	68.00	46.40	14.75	16.05	204.50	147.00	28.48	0.50
15	IC329185	78.00	52.50	10.65	7.60	210.40	138.00	22.47	0.50
16	NIC 22530	97.00	57.15	13.05	12.35	234.20	160.00	83.95	0.40
17	IC107295	96.00	65.20	9.85	8.85	262.80	140.00	78.38	0.40
18	IC108086	92.00	51.40	11.50	9.30	196.95	144.00	70.94	0.40
19	NC 58232	100.00	49.50	12.55	11.80	166.05	160.00	60.58	0.40
20	IC109734	91.00	65.50	14.00	12.95	240.15	159.00	53.04	0.40
21	IC328854	83.00	55.20	8.05	4.87	211.20	130.00	45.07	0.40

S. No.	Accession No.	Quantitative							
		Days to 50% flowering	Inflorescence Length (cm)	Leaf length (cm)	Leaf width (cm)	Plant height (cm)	Days to 80% maturity	Seed yield/plant (g)	1000 seed weight (g)
22	IC109480	97.00	48.25	13.60	12.35	212.55	161.00	44.58	0.40
23	IC341701	100.00	45.95	11.55	8.95	201.40	159.00	27.31	0.40
24	IC341715	96.00	56.45	10.80	9.35	213.05	162.00	20.93	0.30
25	IC343192	99.00	54.20	12.20	10.30	270.40	146.00	15.00	0.20
Means for check varieties									
	IC415477	68.75	54.575	9.325	4.5625	191.85	118.25	177.3625	1.4
	Minimum	68.00	45.10	6.85	3.85	27.90	118.25	15.00	0.20
	Maximum	100.00	65.50	15.40	16.05	270.40	162.00	177.36	1.40
	Mean	91.07	53.37	11.68	9.66	215.62	144.66	59.71	0.55
	SD	9.40	5.26	2.14	3.22	47.85	11.51	38.02	0.23
	CV (%)	10.32	9.85	18.31	33.34	22.19	7.95	63.67	41.54

Table 88: Characterization of germplasm lines in chenopodium at Shimla – Hills (2005)

S. No.	Accession No.	Qualitative									
		Early plant vigour	Growth habit	Infl. Colour	Infl. Shape	Stem branching	Stem colour	Leaf colour	Leaf tip	Leaf Shape	Seed colour
1	NIC 22499	3	1	2	1	2	1	1	2	2	4
2	EC359447	3	1	3	1	2	1	1	2	2	4
3	IC107299	3	1	2	1	2	1	1	1	6	4
4	IC341710	3	1	1	1	2	1	1	1	6	4
5	EC359451	3	1	1	1	2	1	1	2	2	4
6	IC107185	2	1	1	1	2	2	1	2	2	4
7	IC341698	3	1	1	1	2	1	1	1	6	4
8	IC341708	3	1	2	1	2	1	1	2	2	4
9	IC329470	3	1	1	1	2	1	1	2	6	3
10	IC329494	3	1	3	1	2	1	1	2	2	3
11	IC328878	3	1	2	1	2	1	1	2	2	4
12	NUIC 15022	3	1	2	1	2	1	1	2	2	4
13	IC108088	3	1	3	1	2	1	1	2	6	4
14	IC108816	3	1	2	1	2	1	1	2	2	4
15	IC329185	3	1	1	1	2	1	1	1	6	4
16	NIC 22530	3	1	2	1	2	1	1	2	2	4
17	IC107295	3	1	2	1	2	1	1	2	2	4
18	IC108086	3	1	2	1	2	1	1	2	2	4
19	NC 58232	3	1	2	1	2	1	1	2	2	4
20	IC109734	3	1	2	1	2	1	1	2	2	4
21	IC328854	3	1	2	1	2	1	1	2	2	4

S. No.	Accession No.	Qualitative									
		Early plant vigour	Growth habit	Infl. Colour	Infl. Shape	Stem branching	Stem colour	Leaf colour	Leaf tip	Leaf Shape	Seed colour
22	IC109480	3	1	2	1	2	1	1	2	2	4
23	IC341701	3	1	2	1	2	1	1	2	2	4
24	IC341715	3	1	2	1	2	1	1	2	2	4
25	IC343192	3	1	1	1	2	1	1	1	6	4
Means for check varieties											
	IC415477	3	1	1	1	2	1.5	1	1	6	4

Qualitative Descriptors: Early plant vigour: 1-poor, 2-good, 3-very good; Plant growth habit: 1-erect, 2-semi-erect, 3-angled, 99-others; Inflorescence colour: 1-yellowish green, 2-reddish green, 3-pinkish green, 99-others; Inflorescence (shape or orientation): 1-globose, 2-slender with axillary cluster, 3-terminal, 4-panicled spike, 99-others; Flower clusters: 3-lax, 7-dense, 99-others; Stem branching: 1-Unbranched, 2-moderately branched, 3-profusedly branched, 99-others; Stem colour: 1-yellow, 2-red, 3-pink, 99-others; Leaf colour: 1-green, 2-red, 3-pink, 99-others; Leaf tip: 1-obtuse, 2-rounded, 99-others; Leaf shape: 1-triangular, 2-hestate, 3-deltoid, 4-cordate, 5-ovate, 6-oblong, 7-rhombic, 8-deeply unequally toothed, 99-others; Seed colour: 1-white, 2-pink, 3-brown, 4-black, 99-others.

Table 89. Promising lines in rice bean germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Shimla (Accessions 50)				
1.	Days to flowering	79.0-98.0	No Accessions	PRR-2 (79.0 days)
2.	Leaf at size (cm ²)	75.7-176.8	LRB-36, IC374483, LRB-159, LRB-7, LRB-53, LRB-1, LRB-20, LRB-75-1, LRB-161, LRB-23, LRB-63, LRB-74-3, LRB-8, LRB-34, LRB22-2, LRB-84, LRB-35-1, LRB-75-2, LRB-66, BRS-2, LRB-76, IC330410, LRB-141, LRB-4-2, LRB-22, LRB-11, LRB-18, LRB-17 > (123.0 cm ²)	PRR-1 (98.43 cm ²)
3.	No. of branches per plant	8.6-12.0	IC342379, LRB-159, LRB-9, IC330410, LRB-7, LRB-23, LRB-63, LRB-74-3, LRB-84, LRB-75-2, BRS-2, LRB-26, LRB-37, LRB-170 > (11.0)	PRR-2 (10.0)
4.	Stem thickness (mm)		LRB-159, LRB-170, LRB-74-2, LRB-141, LRB-76, LRB-84, LRB-12, LRB-0, LRB-11, LRB-74-3 > (7.0 mm)	PRR-1 (5.62 mm)
5.	Pod length (cm)	8.4-14.3	LRB-36, LRB-75-1 > (14.0 cm)	PRR-2 (13.20 cm)
6.	Days to maturity	150.0-163.0	LRB-7, LRB22-2, LRB-6, LRB-8 < (1153.0 days)	PRR-2 (153.0 days)
7.	No. of seeds per pod	6.6-11.3	LRB-76, LRB-36, LRB-17, LRB-37, LRB-50, LRB-79, BRS-2, LRB-159, LRB-78 > (10.70)	PRR-2 (10.00)
8.	100 seed weight (g)	5.2-9.6	LRB-23, LRB-74-3, LRB-76, LRB-26, LRB-17, LRB-36, LRB-18, LRB-63, IC330410, LRB-20, LRB-48, LRB22-2, LRB-1 > (8.0 g)	PRR-2 (6.52 g)
Shillong (Accessions 50)				
1.	Days to flowering	62.5-86.0	No Accessions	PRR-1 (62.50 days)
2.	Days to maturity	102.0-130.0	No Accessions	RBL-6 (102.0 days)
3.	Plant height (cm)	81.9-158.5	RD107 (IC374483), LRB053, LRB011, LRB037, LRB007, LRB013, LRB005, RS76/99 (IC335412) > (126.0 cm)	RBL-1 (118.70 cm)
4.	No. of primary branches	2.6-6.8	LRB017, RD107 (IC374483) > (5.65)	RBL-6 (5.65)
5.	Grain yield (q/ha)	3.9-19.0	LRB053, LRB075-2, LRB012, LRB036, LRB022, LRB076 > (14.0 q/ha)	RBL-6 (12.73 q/ha)
5.	No. of seeds per pod	7.8-10.2	LRB161, LRB199, LRB050 > (10.00)	PRR-2 (9.80)

S.No.	Characters	Range	Promising lines	Highest value of best check
6.	100 seed weight (g)	4.9-11.0	USK384 (IC330410), RD107 (IC374483), RB5 (IC342379), LRB012, LRB079, LRB038 > (6.85)	RBL-1 (6.35 g)
7.	Pod length (cm)	10.2-12.1	LRB199, LRB036 > (12.0 cm)	PRR-2 (11.60 cm)
Ranichauri (Accessions 50)				
1.	Days to flowering	70.0-86.0	BRS 2 < (72.0 days)	PRR-1 (72.80 days)
2.	Days to maturity	161.0-177.0	BRS 2, LRB 8 > (164.40 days)	PRR-1 (164.40 days)
3.	Plant height (cm)	42.3-133.0	LRB 6, LRB 11, LRB 2, LRB 12, LRB 37, LRB 20 > (115.0 cm)	PRR-2 (90.80 cm)
4.	Pod length (cm)	5.0-14.0	BRS 2, LRB 30, LRB 170, RS 76/99 (IC 335412), LRB 20 > (10.60 cm)	PRR-2 (9.13 cm)
5.	No. of pod per plant	4.0-22.7	LRB 22-2, IC 342379, LRB 18, LRB 30, LRB 17, LRB 15, LRB 22, LRB 20 > (17.0)	PRR-2 (15.66)
6.	No. of seed per plant	2.3-7.0	LRB 30, LRB 23, LRB 48, LRB 18, LRB 15, LRB 20, LRB 13, LRB 9, LRB 70, LRB 37, LRB 22-2, LRB 17, LRB 6, LRB 10, LRB 5, LRB 42, LRB 50, RB5 (IC 342379), LRB 2, LRB 8, LRB 141, LRB 34, BRS 2 > (5.0)	PRR-1 (4.83)
7.	No. of leaves per plant	12.5-31.0	LRB 8, LRB 11, LRB 9, LRB 5, LRB 10, LRB 20 > (24.0)	PRR-2 (22.53)
8.	No. of pod per bunch	1.0-3.0	LRB 30, LRB 22-2, LRB 17 > (2.33)	PRR-1 (2.26)
9.	Seed yield per plant (g)	12.1-50.2	LRB 22-2, LRB 15, LRB 18, LRB 9 > (40.0 g)	PRR-1 (35.04 g)
Bhowali (Accessions 62)				
1.	Days to flowering	67.0-95.0	IC436977, IC444185, LRB-75-2, LRB-742, LRB-79, IC444164 < (67.25 days)	BRS-1 (67.25 days)
2.	Plant height (cm)	17.1-300.0	LRB-30, LRB-37, LRB-15, LRB-26, LRB-23, LRB-36, LRB-17, LRB-159, LRB-161, LRB-42, LRB-18, LRB-74-3, LRB-9 > (236.0 cm)	PRR-2 (172.64 cm)
3.	Pod length (cm)	8.4-15.8	LRB-199, LRB-141, LRB-2, LRB-63, LRB-10, LRB-161, LRB-9, LRB-66 > (13.0 cm)	PRR-2 (11.8 cm)
4.	Days to 80% maturity	64.0-170.0	LRB-5, LRB-79, IC444194, IC444195, IC444189, IC444142, IC444157, LRB-78 < (130.0 days)	Naini (130.4 days)

S.No.	Characters	Range	Promising lines	Highest value of best check
5.	No. of seed per pod	8.0-13.0	LRB-199, IC444184, LRB-66 > (11.0)	PRR-2 (10.4)
6.	100 seed weight (g)	5.5-13.7	IC342379, IC444172, LRB-30, LRB-22-2, LRB-84, IC335412, LRB-2, LRB-17, LRB-21, IC435960, LRB-199 > (8.1 g)	PRR-2 (7.6 g)
7.	Yield per plant (g)	0.3-18.1	LRB-9, LRB-10, IC444191, IC444189 > (14.0 g)	BRS-1 (13.9 g)
8.	Yield (q/ha)	0.6-40.3	LRB-9, LRB-10, IC444191, IC444189, IC436981, LRB-30, IC444184, IC444185, LRB-23, LRB-8, IC335412, LRB-15, IC444164 > (20.0 q/ha)	PRR-2 (17.32 q/ha)
Palampur (Accessions 43)				
1.	Days to maturity	118.0-141.0	LRB75I, LRB008, LRB010, LRB012, LRB022, LRB078 < (1200 days)	RBL-6 (126 days)
2.	Plant height (cm)	54.0-97.0	LRB141, IC330410, LRB002 > (88 cm)	BRS-1 (81.5 cm)
3.	Seed yield (q/ha)	1.0-23.4	IC374483, LRB35I, LRB743, LRB161, LRB023, LRB013 > (18.0 q/ha)	PRR-2 (13.94 q/ha)
Best entries over locations				
1.	No. of primary branches	0.0-8.7	LRB084, LRB009, LRB053, LRB075-2, LRB074-3, LRB074-2, LRB050, LRB075-1, LRB022-2, LRB035-1, LRB048 > (6.0)	PRR-2 (5.19)
2.	Pod length (cm)	8.5-13.0	LRB075-2, LRB076 > (11.92 cm)	PRR-2 (11.43 cm)
3.	Days to maturity	114.0-136.0	No Accessions	RBL-6 (114.0 days)
4.	No. of seed per pod	8.0-12.0	IC444184, LRB050 > (10.60)	PRR-2 (10.07)
5.	100 seed weight (g)	5.5-69.0	IC444172, IC342379, IC374483, IC330410, LRB021, IC435960, LRB012, LRB030, LRB023, LRB026, LRB084, LRB022-2, LRB017, LRB076 > (7.50 g)	PRR-2 (6.69 g)
6.	Plant height (cm)	59.3-230.0	IC444172, IC444185, IC444184 > (163.86 cm)	Naini (16.86 cm)
7.	Yield per plant (g)	0.3-38.0	LRB022, LRB015, LRB009, LRB022-2 > (26.0 g)	PRR-2 (20.67 g)
8.	Grain yield (q/ha)	0.3-26.4	LRB009, LRB010, LRB023, IC335412, IC444191, LRB013, LRB035-1, IC444189, IC374483, LRB005, IC436981, LRB015 > (15.0 q/ha)	RBL-6 (12.91 q/ha)

Table 90: Multilocation evaluation of germplasm lines in rice bean at Shimla, Bhowali, Ranichauri, Shillong and Palampur – Hills (2005)

S. No.	Accession No.	Days to flowering						No. of branches/plant				Pod length (cm)					Days to Maturity						No. of Seed/ Pod			
		Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Palampur	Shillong	Mean	Shimla	Bhowali	Ranichauri	Shillong	Mean	Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Bhowali	Shillong	Mean
1	BRS2	91.0		52.0	70.0	71.0	71.0	11.0	0.1	5.5	5.5	13.2		14.0	10.8	12.7	159.0		136.0	161.0	107.0	140.8	11.0		8.5	9.7
2	IC330410	96.0	70.0	57.0	82.0	78.0	76.6	11.3	0.1	5.2	5.5	11.1	9.2	9.0	11.1	10.1	159.0	160.0	141.0	172.0	111.0	148.6	8.6	8.0	9.0	8.5
3	IC335412	95.0	70.0	50.0	80.0	73.0	73.6	9.0	0.3	5.3	4.9	10.6	11.0	11.3	12.0	11.2	155.0	130.0	134.0	170.0	103.0	138.4	8.0	9.0	9.8	8.9
4	IC342379	96.0	85.0		77.0	77.0	83.8	12.0		5.5	8.7	9.2	12.9	8.0	11.1	10.3	156.0	170.0		168.0	130.0	156.0	7.6	9.0	8.3	8.3
5	IC374483	90.0		66.0	84.0	79.0	79.8	10.3	0.4	6.3	5.7	10.6		7.7	11.9	10.0	163.0		121.0	175.0	116.0	143.8	7.3		9.5	8.4
6	IC435960		82.0				82.0						9.8		9.8			150.0			150.0		9.0		9.0	
7	IC436977		67.0				67.0						9.3		9.3			133.0			133.0		9.0		9.0	
8	IC436981		75.0				75.0						9.5		9.5			136.0			136.0		9.0		9.0	
9	IC444138		77.0				77.0						8.7		8.7			132.0			132.0		9.0		9.0	
10	IC444142		70.0				70.0						10.0		10.0			128.0			128.0		10.0		10.0	
11	IC444157		70.0				70.0						8.5		8.5			128.0			128.0		9.0		9.0	
12	IC444164		67.0				67.0						9.3		9.3			135.0			135.0		10.0		10.0	
13	IC444172		70.0				70.0						10.8		10.8			136.9			136.9		9.0		9.0	
14	IC444184		70.0				70.0						13.0		13.0			136.0			136.0		12.0		12.0	
15	IC444185		67.0				67.0						10.8		10.8			136.0			136.0		9.0		9.0	
16	IC444189		70.0				70.0						10.1		10.1			128.0			128.0		10.0		10.0	
17	IC444191		75.0				75.0						11.3		11.3			136.0			136.0		10.0		10.0	
18	IC444194		70.0				70.0						9.2		9.2			126.0			126.0		10.0		10.0	
19	IC444195		70.0				70.0						9.1		9.1			126.0			126.0		9.0		9.0	

S. No.	Accession No.	100 Seed weight (g)				Plant height (cm)					Yield/ Plant (g)			Grain yield (q/ha)				Ranichauri			
		Shimla	Bhowali	Shillong	Mean	Bhowali	Palampur	Ranichauri	Shillong	Mean	Bhowali	Ranichauri	Mean	Bhowali	Palampur	Shillong	Mean	No. of pod /plant	No. of leaves /plant	No. of pod /bunch	No. of seed /plant
1	BRS2	7.2		6.0	6.6		86.0	42.3	98.7	75.7		24.1	24.1		5.5	9.9	7.7	9.0	19.0	2.0	5.1
2	IC330410	8.3	7.0	11.0	8.8	74.3	91.0	73.3	110.7	87.3	3.1	12.1	7.6	6.9	6.2	11.5	8.2	12.7	18.0	1.3	4.0
3	IC335412	6.0	8.7	6.0	6.9	198.6	78.0	102.7	126.7	126.5	10.6	14.7	12.7	23.6	17.2	13.5	18.1	11.0	21.7	1.3	5.0
4	IC342379	7.0	13.7	9.3	10.0	220.0		77.7	113.5	137.1	1.5	13.1	7.3	1.1		12.7	6.9	20.7	24.4	1.7	5.7
5	IC374483	7.4		10.6	9.0		84.0	50.3	158.5	97.6		18.7	18.7		23.4	7.7	15.5	10.0	15.2	1.7	4.7
6	IC435960		8.5		8.5	116.6				116.6	3.1		3.1	19.4		0.0	9.7				
7	IC436977		5.5		5.5	95.0				95.0	0.3		0.3	0.6		0.0	0.3				
8	IC436981		6.0		6.0	101.6				101.6	13.7		13.7	30.6		0.0	15.3				
9	IC444138		6.0		6.0	73.3				73.3	0.6		0.6	1.4		0.0	0.7				
10	IC444142		7.2		7.2	81.0				81.0	6.8		6.8	15.3		0.0	7.6				
11	IC444157		6.8		6.8	79.0				79.0	6.2		6.2	13.9		0.0	6.9				
12	IC444164		6.1		6.1	151.3				151.3	10.6		10.6	23.6		0.0	11.8				
13	IC444172		10.4		10.4	230.0				230.0	8.7		8.7	4.4		0.0	2.2				
14	IC444184		6.4		6.4	196.0				196.0	12.5		12.5	27.8		0.0	13.9				
15	IC444185		5.8		5.8	229.6				229.6	12.5		12.5	27.8		0.0	13.9				
16	IC444189		6.5		6.5	163.3				163.3	14.3		14.3	31.9		0.0	16.0				
17	IC444191		6.9		6.9	163.3				163.3	15.6		15.6	36.1		0.0	18.1				
18	IC444194		5.8		5.8	101.3				101.3	6.2		6.2	13.9		0.0	6.9				
19	IC444195		6.2		6.2	59.3				59.3	3.1		3.1	6.9		0.0	3.5				

S. No.	Accession No.	Days to flowering						No. of branches/plant				Pod length (cm)					Days to Maturity						No. of Seed/ Pod			
		Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Palampur	Shillong	Mean	Shimla	Bhowali	Ranichauri	Shillong	Mean	Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Bhowali	Shillong	Mean
20	LRB001	89.0	82.0	64.0	76.0	72.0	76.6	9.0	0.3	4.8	4.7	11.2	11.9	9.0	11.5	10.9	158.0	160.0	136.0	166.0	108.5	145.7	7.0	11.0	8.5	8.8
21	LRB002	90.0	77.0	58.0	86.0	70.0	76.2	9.0	0.2	2.6	3.9	10.7	11.8	10.7	11.1	11.1	156.0	160.0	121.0	172.0	105.0	142.8	6.6	10.0	8.1	8.2
22	LRB005	91.0	80.0	52.0	76.0	73.0	74.4	8.6	0.3	3.5	4.1	12.4	10.8	9.3	10.7	10.8	154.0	64.0	133.0	166.0	105.0	124.4	9.6	9.0	8.6	9.1
23	LRB006	88.0	84.0	57.0	75.0	75.5	75.9	9.3	0.1	3.3	4.2	10.9	11.3	10.7	10.2	10.8	152.0	170.0	121.0	165.0	108.5	143.3	9.0	11.0	9.2	9.7
24	LRB007	89.0	84.0	56.0	76.0	70.0	75.0	11.0	0.1	4.3	5.1	12.3	12.0	9.3	11.5	11.3	150.0	162.0	141.0	166.0	105.0	144.8	8.6	11.0	9.5	9.7
25	LRB008	92.0	80.0	50.0	75.0	69.0	73.2	10.0	0.2	4.2	4.8	10.7	12.7	8.0	11.4	10.7	152.0	163.0	119.0	164.0	108.5	141.3	9.0	11.0	9.8	9.9
26	LRB009	90.0	75.0		85.0	67.0	79.3	11.6		4.2	7.9	11.8	13.2	10.3	11.4	11.7	155.0	153.0		171.0	103.0	145.5	8.6	10.0	9.5	9.4
27	LRB010	94.0	75.0	52.0	80.0	66.0	73.4	9.0	0.3	4.2	4.5	12.8	13.5	10.7	10.4	11.8	156.0	133.0	119.0	169.0	103.0	136.0	8.6	10.0	8.6	9.1
28	LRB011	95.0	77.0	66.0	82.0	72.0	78.4	9.0	0.0	3.0	4.0	10.4	10.9	6.0	11.5	9.7	155.0	165.0	138.0	170.0	112.5	148.1	9.3	9.0	8.8	9.0
29	LRB012	94.0		52.0	80.0	86.0	78.0	10.0	0.2	4.3	4.8	11.8		7.8	11.1	10.2	158.0		119.0	170.0	114.0	140.3	9.6		9.2	9.4
30	LRB013	98.0	77.0	67.0	80.0	72.0	78.8	10.3	0.3	3.8	4.8	12.2	11.0	9.0	11.6	11.0	153.0	153.0	135.0	170.0	104.0	143.0	9.6	10.0	9.5	9.7
31	LRB015	96.0	75.0	66.0	82.0	72.0	78.2	9.6	0.2	4.1	4.6	12.3	12.7	10.7	10.4	11.5	155.0	162.0	121.0	172.0	109.0	143.8	10.3	10.0	8.8	9.7
32	LRB017	92.0	77.0	52.0	85.0	67.0	74.6	10.3	0.3	6.8	5.8	13.2	12.7	10.3	10.8	11.8	156.0	152.0	136.0	174.0	109.0	145.4	11.0	11.0	8.0	10.0
33	LRB018	91.0	75.0	58.0	85.0	70.0	75.8	10.0	0.3	3.5	4.6	9.6	12.2	10.0	10.6	10.6	153.0	143.0	121.0	175.0	110.0	140.4	10.0	10.0	8.0	9.3
34	LRB020	90.0	75.0	67.0	75.0	73.0	76.0	9.0	0.1	5.0	4.7	10.3	10.3	11.0	10.3	10.5	154.0	140.0	136.0	166.0	108.5	140.9	9.0	9.0	7.8	8.6
35	LRB021		75.0				75.0						11.9			11.9		140.0				140.0		9.0		9.0
36	LRB022	89.0		52.0	84.0	68.0	73.3	10.3	0.2	4.2	4.9	10.2		7.3	10.5	9.3	155.0		119.0	175.0	105.5	138.6	9.0		8.5	8.8
37	LRB022-2	92.0	77.0		80.0	68.0	79.3	9.0		4.2	6.6	11.4	12.5	8.0	11.1	10.8	152.0	132.0		171.0	108.0	140.8	8.6	9.0	9.0	8.9
38	LRB023	87.0	75.0	66.0	85.0	65.5	75.7	11.0	0.4	4.3	5.2	11.5	12.6	9.3	10.7	11.0	157.0	170.0	136.0	176.0	107.5	149.3	8.4	11.0	8.3	9.2
39	LRB026	91.0	85.0	67.0	86.0	70.0	79.8	11.0	0.2	5.5	5.6	10.2	12.4	9.0	11.8	10.9	155.0	148.0	134.0	177.0	104.5	143.7	10.0	10.0	9.3	9.8
40	LRB030	90.0	85.0	67.0	85.0	73.5	80.1	10.3	0.1	3.7	4.7	10.4	13.0	12.0	10.5	11.5	153.0	150.0	136.0	175.0	111.5	145.1	9.6	10.0	8.3	9.3
41	LRB034	90.0	85.0		85.0	70.0	82.5	9.0		3.0	6.0	12.0	12.9	9.0	10.5	11.1	155.0	146.0		176.0	102.0	144.8	10.0	10.0	8.7	9.6

S. No.	Accession No.	100 Seed weight (g)				Plant height (cm)					Yield/ Plant (g)			Grain yield (q/ha)				Ranichauri			
		Shimla	Bhowali	Shillong	Mean	Bhowali	Palampur	Ranichauri	Shillong	Mean	Bhowali	Ranichauri	Mean	Bhowali	Palampur	Shillong	Mean	No. of pod /plant	No. of leaves /plant	No. of pod /bunch	No. of seed /plant
20	LRB001	8.0	5.7	5.8	6.5	85.3	72.0	74.7	96.0	82.0	3.1	31.3	17.2	6.9	16.4	11.5	11.6	16.7	23.0	1.7	5.0
21	LRB002	7.6	6.9	5.2	6.5	138.0	90.0	120.0	96.2	111.0	8.7	12.3	10.5	19.4	10.3	8.2	12.6	15.0	20.7	2.0	5.7
22	LRB005	6.2	5.9	6.1	6.1	146.0	75.0	92.3	129.0	110.6	8.7	18.5	13.6	19.4	17.5	9.5	15.5	12.3	27.3	1.7	6.0
23	LRB006	7.1	6.1	6.4	6.5	17.1	81.0	133.0	110.2	85.3	3.7	14.5	9.1	8.3	8.3	6.3	7.6	14.0	20.7	1.7	6.0
24	LRB007	6.5	6.4	5.6	6.2	148.0	75.0	80.0	130.9	108.5	6.8	20.1	13.5	15.3	6.2	8.0	9.8	10.3	19.7	2.0	5.0
25	LRB008	6.3	7.4	5.8	6.5	147.0	82.0	87.3	114.7	107.7	11.8	16.4	14.1	26.4	6.6	11.1	14.7	13.0	31.0	1.3	5.3
26	LRB009	7.9	7.6	6.4	7.3	236.3		98.0	98.3	144.2	18.1	40.1	29.1	40.3		12.5	26.4	12.0	27.7	1.7	6.3
27	LRB010	7.9	7.1	5.4	6.8	210.3	66.0	96.3	114.3	121.7	16.2	35.1	25.6	36.1	17.1	11.2	21.5	13.0	26.0	1.7	6.0
28	LRB011	7.6	7.8	6.8	7.4	167.6	70.0	122.0	135.5	123.8	8.1	20.0	14.1	18.1	1.5	8.1	9.2	7.3	30.3	1.0	3.3
29	LRB012	7.6		8.4	8.0		86.0	119.7	118.0	107.9		12.8	12.8		11.7	15.7	13.7	10.0	18.0	1.0	4.0
30	LRB013	6.9	7.0	6.5	6.8	216.0	85.0	70.0	129.9	125.2	8.7	16.9	12.8	19.4	18.1	10.9	16.1	13.7	21.0	2.3	6.3
31	LRB015	7.5	8.0	5.9	7.1	283.3	79.0	75.0	114.4	137.9	10.6	48.5	29.5	23.6	11.1	11.1	15.3	19.3	20.0	2.0	6.7
32	LRB017	8.5	8.5	5.8	7.6	259.6	75.0	78.3	124.7	134.4	3.7	27.7	15.7	8.3	14.9	12.8	12.0	20.0	18.3	2.7	6.0
33	LRB018	8.4	7.5	6.3	7.4	242.6	87.0	86.3	98.2	128.5	8.1	43.9	26.0	18.1	14.2	11.0	14.4	20.3	24.7	2.0	6.7
34	LRB020	8.2	7.3	6.3	7.3	124.6	81.0	115.7	96.8	104.5	7.5	18.9	13.2	16.7	5.8	6.9	9.8	17.0	25.0	2.0	6.3
35	LRB021		8.5		8.5	156.0				156.0	8.1		8.1	18.1		0.0	9.0				
36	LRB022	7.2		5.6	6.4		79.0	61.7	109.4	83.3		38.0	38.0		12.9	14.7	13.8	19.0	15.3	2.3	4.7
37	LRB022-2	8.0	9.1	6.0	7.7	158.6		82.3	112.8	117.9	6.8	50.2	28.5	15.3		13.5	14.4	22.7	22.3	2.7	6.0
38	LRB023	9.6	7.7	6.2	7.8	270.0	85.0	93.0	117.7	141.4	11.8	22.8	17.3	26.4	18.8	12.4	19.2	14.7	20.0	1.7	7.0
39	LRB026	8.5	7.9	6.8	7.7	273.6	84.0	71.7	122.8	138.0	8.7	16.5	12.6	19.4	10.2	10.5	13.4	12.3	22.0	1.7	5.0
40	LRB030	7.6	9.2	6.7	7.8	300.0	65.0	84.7	121.5	142.8	12.5	38.9	25.7	27.8	4.1	12.1	14.6	20.0	21.7	3.0	7.0
41	LRB034	7.0	6.4	6.2	6.5	212.0		103.3	85.7	133.7	7.5	21.7	14.6	16.7		10.9	13.8	10.7	20.7	1.7	5.3

S. No.	Accession No.	Days to flowering					No. of branches/plant				Pod length (cm)					Days to Maturity					No. of Seed/ Pod						
		Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Palampur	Shillong	Mean	Shimla	Bhowali	Ranichauri	Shillong	Mean	Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Bhowali	Shillong	Mean	
42	LRB035-1	92.0	77.0		82.0	70.0	80.3	9.0		4.2	6.6	12.3	11.1	7.7	11.4	10.6	156.0	142.0		174.0	105.5	144.4	9.0	11.0	9.5	9.8	
43	LRB036	94.0	84.0	64.0	84.0	68.0	78.8	10.0	0.0	4.3	4.8	14.3	12.0	9.3	12.1	11.9	155.0	146.0	133.0	176.0	105.0	143.0	11.0	11.0	9.8	10.6	
44	LRB037	91.0	82.0	57.0	85.0	65.0	76.0	11.0	0.1	4.1	5.1	11.3	11.9	8.3	10.6	10.5	156.0	146.0	121.0	176.0	103.5	140.5	11.0	10.0	8.8	9.9	
45	LRB038	89.0	90.0	52.0	82.0	68.0	76.2	10.3	0.0	4.8	5.0	8.4	10.4	8.0	10.6	9.3	153.0	160.0	136.0	174.0	103.5	145.3	8.3	8.0	9.0	8.4	
46	LRB042		82.0		85.0	71.0	79.3				3.8	3.8		12.4	9.0	10.9	10.8		155.0		177.0	109.0	147.0		10.0	9.2	9.6
47	LRB048	95.0	75.0		80.0	71.0	80.3	9.0		3.8	6.4	11.2	12.4	10.7	10.7	11.2	156.0	162.0		170.0	103.5	147.9	8.3	10.0	9.3	9.2	
48	LRB050	94.0	80.0		75.0	70.0	79.8	10.3		3.6	7.0	10.2	12.3	10.0	11.5	11.0	157.0	150.0		166.0	109.0	145.5	11.0	11.0	10.2	10.7	
49	LRB053	92.0	82.0		85.0	71.0	82.5	10.0		5.3	7.7	10.2	11.8	6.0	11.7	9.9	156.0	162.0		175.0	130.0	155.8	8.6	11.0	9.4	9.7	
50	LRB063	87.0	82.0	50.0	82.0	71.0	74.4	11.0	0.2	4.0	5.0	10.5	14.3	8.0	11.7	11.1	155.0	162.0	141.0	174.0	107.5	147.9	10.0	11.0	9.3	10.1	
51	LRB066	87.0	84.0	52.0	82.0	71.0	75.2	9.0	0.2	4.7	4.6	11.5	13.2	9.0	11.1	11.2	155.0	150.0	136.0	174.0	113.0	145.6	10.0	12.0	9.0	10.3	
52	LRB074-2	94.0			80.0	71.0	81.7	10.0		4.3	7.2	9.4		8.0	10.9	9.4	155.0			170.0	107.5	144.2	9.3		8.3	8.8	
53	LRB074-3	92.0	80.0		85.0	67.0	81.0	11.0		4.0	7.5	12.0	12.6		10.4	11.7	158.0	150.0		175.0	105.0	147.0	8.6	11.0	8.2	9.3	
54	LRB075-1	93.0	77.0		82.0	72.0	81.0	10.3		3.5	6.9	14.1	10.9		10.5	11.8	156.0	158.0		173.0	107.0	148.5	10.0	8.0	8.3	8.8	
55	LRB075-2	94.0	67.0		84.0	73.0	79.5	11.0		4.0	7.5	13.2	11.8		11.0	12.0	157.0	130.0		174.0	107.0	142.0	10.6	9.0	8.7	9.4	
56	LRB076	91.0	77.0	67.0	85.0	74.0	78.8	10.0	0.2	3.3	4.5	11.7	12.9		11.4	12.0	160.0	137.0	133.0	176.0	108.5	142.9	11.3	11.0	8.7	10.3	
57	LRB078	90.0	77.0	57.0	84.0	68.0	75.2	10.3	0.1	4.7	5.0	11.8	8.4		11.8	10.7	159.0	128.0	119.0	174.0	107.5	137.5	11.0	9.0	8.8	9.6	
58	LRB079	92.0	67.0	64.0	82.0	69.0	74.8	10.0	0.1	5.3	5.1	9.4	9.3		11.2	10.0	158.0	126.0	135.0	171.0	107.0	139.4	11.0	8.0	9.0	9.3	
59	LRB084	89.0	82.0		85.0	70.0	81.5	11.0		5.3	8.2	10.2	12.5	8.0	10.9	10.4	156.0	136.0		175.0	108.5	143.9	10.0	8.0	8.7	8.9	
60	LRB141	95.0	77.0	67.0	85.0	74.0	79.6	10.6	0.2	5.3	5.4	11.3	14.5	7.0	11.4	11.0	158.0	162.0	141.0	175.0	108.5	148.9	10.3	11.0	8.7	10.0	
61	LRB159	96.0	75.0	64.0	80.0	71.0	77.2	11.6	0.0	4.6	5.4	12.2	12.2	7.3	10.9	10.7	159.0	162.0	122.0	171.0	109.0	144.6	11.0	10.0	7.8	9.6	
62	LRB161	95.0	70.0	52.0	81.0	69.0	73.4	10.3	0.4	4.3	5.0	10.4	13.3	10.7	11.5	11.5	156.0	162.0	122.0	172.0	106.5	143.7	9.6	11.0	10.2	10.3	
63	LRB162	96.0	87.0	57.0	80.0	70.0	78.0	9.0	0.1	5.0	4.7	8.4	11.7	5.0	11.4	9.1	158.0	170.0	121.0	170.0	110.5	145.9	7.3	10.0	9.3	8.9	

S. No.	Accession No.	100 Seed weight (g)				Plant height (cm)					Yield/ Plant (g)			Grain yield (q/ha)				Ranichauri			
		Shimla	Bhowali	Shillong	Mean	Bhowali	Palampur	Ranichauri	Shillong	Mean	Bhowali	Ranichauri	Mean	Bhowali	Palampur	Shillong	Mean	No. of pod /plant	No. of leaves /plant	No. of pod /bunch	No. of seed /plant
42	LRB035-1	7.9	5.8	6.9	6.8	200.6		92.0	99.0	130.5	8.7	14.8	11.7	19.4		12.6	16.0	10.3	20.0	1.7	4.0
43	LRB036	8.4	6.1	6.6	7.0	260.0	84.0	95.8	98.0	134.4	8.1	16.7	12.4	18.1	2.7	14.9	11.9	10.7	20.0	2.0	5.0
44	LRB037	6.3	7.0	6.2	6.5	296.0	81.0	116.0	131.5	156.1	8.1	18.6	13.4	18.1	8.1	11.3	12.5	11.0	24.0	1.3	6.3
45	LRB038	5.2	5.6	7.0	5.9	79.6	81.0	97.7	97.9	89.0	0.6	14.4	7.5	1.4	1.0	11.4	4.6	10.0	19.7	2.3	4.3
46	LRB042		6.9	6.1	6.5	249.0		102.3	96.0	149.1	6.2	18.4	12.3	13.9		13.7	13.8	9.0	15.3	1.3	6.0
47	LRB048	8.2	7.2	6.2	7.2	194.6		65.3	89.8	116.6	6.2	17.0	11.6	13.9		11.5	12.7	10.7	20.3	1.3	7.0
48	LRB050	7.1	7.0	5.8	6.6	132.6		70.7	97.2	100.1	3.7	15.0	9.4	8.3		8.7	8.5	6.0	16.0	1.3	6.0
49	LRB053	7.3	6.6	6.7	6.8	207.3		57.0	146.5	136.9	3.7	18.4	11.1	8.3		19.0	13.7	5.3	15.3	1.3	4.7
50	LRB063	8.4	6.4	5.6	6.8	185.6	79.0	80.3	124.8	117.4	3.1	16.7	9.9	6.9	10.4	8.6	8.6	6.0	20.7	1.3	4.3
51	LRB066	7.4	7.8	6.3	7.2	224.6	73.0	58.7	103.2	114.9	3.7	12.9	8.3	8.3	9.2	11.6	9.7	10.0	16.5	1.0	4.0
52	LRB074-2	7.0		5.2	6.1			68.7	93.0	80.8		15.4	15.4			11.4	11.4	9.5	14.3	1.3	3.0
53	LRB074-3	9.6	6.6	5.6	7.2	237.6		85.8	104.7	142.7	2.5		2.5	5.6		8.5	7.0		18.0		
54	LRB075-1	7.3	5.5	6.5	6.4	181.6		72.5	90.2	114.7	3.7		3.7	8.3		8.8	8.6		16.5		
55	LRB075-2	6.7	6.7	6.4	6.6	98.0		62.5	94.2	84.9	5.0		5.0	11.1		17.0	14.0		17.4		
56	LRB076	9.0	7.7	6.0	7.6	188.6	78.0	48.0	94.3	102.2	3.1		3.1	6.9	11.9	14.2	11.0		14.5		
57	LRB078	7.0	7.0	6.1	6.7	61.0	81.0	70.0	115.8	82.0	5.5		5.5	5.6	4.5	8.5	6.2		12.5		
58	LRB079	7.6	7.3	7.1	7.3	84.6	79.0	56.5	90.8	77.7	2.5		2.5	5.6	3.4	12.6	7.2		16.0		
59	LRB084	7.5	8.8	6.8	7.7	71.3		68.7	81.9	73.9	1.2	12.7	6.9	2.8		11.2	7.0	7.7	17.0	1.7	4.0
60	LRB141	6.4	6.6	5.5	6.2	214.0	97.0	60.3	109.8	120.3	2.5	17.5	10.0	5.6	12.1	8.6	8.8	12.0	22.0	1.3	5.3
61	LRB159	7.1	7.2	6.4	6.9	255.0	81.0	62.0	86.1	121.0	3.1	14.6	8.8	6.9	1.6	10.3	6.3	6.7	20.0	1.7	4.0
62	LRB161	7.0	7.1	5.6	6.6	254.6	85.0	71.0	105.8	129.1	3.7	13.7	8.7	8.3	22.5	13.8	14.9	9.7	20.0	1.7	3.3
63	LRB162	7.2	7.2	4.9	6.4	218.6	73.0	52.0	125.2	117.2	3.0	16.8	9.9	0.6	5.2	12.2	6.0	4.0	13.7	1.0	2.3

S. No.	Accession No.	Days to flowering						No. of branches/plant				Pod length (cm)					Days to Maturity						No. of Seed/ Pod			
		Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Palampur	Shillong	Mean	Shimla	Bhowali	Ranichauri	Shillong	Mean	Shimla	Bhowali	Palampur	Ranichauri	Shillong	Mean	Shimla	Bhowali	Shillong	Mean
64	LRB170	94.0	95.0	67.0	85.0	71.0	82.4	11.0	0.1	4.3	5.1	9.5	11.6	12.0	10.9	11.0	159.0	***	134.0	176.0	105.5	143.6	8.6	10.0	8.3	9.0
65	LRB184			66.0			66.0		0.3		0.3							139.0			139.0					
66	LRB199	88.0	95.0	67.0	84.0	71.0	81.0	10.3	0.0	4.8	5.0	8.5	15.8	8.0	12.1	11.1	157.0	148.0	133.0	174.0	105.5	143.5	7.3	13.0	10.2	10.2
67	LRB222			52.0			52.0		0.2		0.2							136.0			136.0					
68	LRB351			67.0			67.0		0.5		0.5							122.0			122.0					
69	LRB742		67.0	63.0			65.0		0.0		0.0		10.0		10.0			133.0	133.0		133.0		8.0		8.0	
70	LRB743			52.0			52.0		0.4		0.4							136.0			136.0					
71	LRB751			66.0			66.0		0.2		0.2							118.0			118.0					
72	BRS-1		67.3	61.5	75.8		68.2		0.2		0.2		10.7	7.8		9.3		134.5	137.0	167.8	146.4		10.0		10.0	
Means for check varieties																										
	Naini		70.0				70.0						10.1		10.1			130.4			130.4		9.8		9.8	
	PRR1	87.5	67.8	50.0	72.8	62.5	68.1	9.9	0.2	4.2	4.8	9.7	9.2	8.3	10.2	9.3	155.5	135.4	129.0	164.4	104.0	137.7	8.3	9.4	8.7	8.8
	PRR2	79.0	73.2	52.0	74.2	70.0	69.7	10.0	0.3	5.3	5.2	13.2	11.8	9.1	11.6	11.4	153.0	138.4	126.5	165.2	105.0	137.6	10.0	10.4	9.8	10.1
	RBL1			58.5		63.5	61.0		0.3	4.2	2.2				10.6	10.6		130.0			103.0	116.5		9.5	9.5	
	RBL6			67.0		67.0	67.0		0.2	5.7	2.9				10.9	10.9		126.0			102.0	114.0		8.3	8.3	
	RBL35			52.0			52.0		0.2		0.2							134.0			134.0					
	Minimum	79.0	67.0	50.0	70.0	62.5	52.0	8.6	0.0	2.6	0.0	8.4	8.4	5.0	10.2	8.5	150.0	64.0	118.0	161.0	102.0	114.0	6.6	8.0	7.8	8.0
	Maximum	98.0	95.0	67.0	86.0	86.0	83.8	12.0	0.5	6.8	8.7	14.3	15.8	14.0	12.1	13.0	163.0	170.0	141.0	177.0	130.0	156.0	11.3	13.0	10.2	12.0
	Mean	91.6	76.8	59.0	81.2	70.7	74.2	10.1	0.2	4.4	4.7	11.1	11.5	9.0	11.1	10.6	155.9	144.8	129.9	171.5	107.9	139.8	9.3	9.9	8.9	9.4
	CV(%)	3.6	6.6	11.5	5.0	5.5	9.1	8.4	58.1	24.8	44.5	12.5	12.4	18.9	7.4	8.8	1.5	6.9	6.2	2.3	3.7	5.9	12.9	8.6	9.2	7.2
	CD1(.05)		NS			7.7					2.1		NS		1.6						7.8		NS		1.6	

S. No.	Accession No.	100 Seed weight (g)				Plant height (cm)					Yield/ Plant (g)			Grain yield (q/ha)				Ranichauri			
		Shimla	Bhowali	Shillong	Mean	Bhowali	Palampur	Ranichauri	Shillong	Mean	Bhowali	Ranichauri	Mean	Bhowali	Palampur	Shillong	Mean	No. of pod /plant	No. of leaves /plant	No. of pod /bunch	No. of seed /plant
64	LRB170	6.2		6.1	6.1	212.6	86.0	75.7	98.8	118.3		14.1	14.1		8.1	5.2	6.6	11.3	24.0	2.0	6.3
65	LRB184						78.0			78.0					17.5	0.0	8.8				
66	LRB199	6.3	8.1	5.8	6.7	113.6	73.0	51.3	113.9	87.9	3.0	15.0	9.0	0.6	1.4	8.7	3.6	12.3	18.0	1.3	4.0
67	LRB222						69.0			69.0					11.8	0.0	5.9				
68	LRB351						77.0			77.0					23.1	0.0	11.5				
69	LRB742		7.2		7.2	69.0	69.0			69.0	2.5		2.5	5.6	1.6	0.0	2.4				
70	LRB743						81.0			81.0					22.8	0.0	11.4				
71	LRB751						83.0			83.0					13.4	0.0	6.7				
72	BRS-1		6.4		6.4	136.3	81.5	86.8		101.5	13.9	23.2	18.5	14.3	13.4	0.0	9.2	12.3	19.6	1.8	4.4
Means for check varieties																					
	Naini		5.8		5.8	163.9				163.9	5.1		5.1	9.7		0.0	4.8				
	PRR1	6.3	5.9	5.6	6.0	127.8	77.5	69.7	86.5	90.4	4.5	35.0	19.8	8.3	13.8	10.9	11.0	14.9	21.0	2.3	4.8
	PRR2	6.5	7.6	6.0	6.7	172.6	80.5	90.8	105.4	112.3	11.4	30.0	20.7	17.3	13.9	5.5	12.2	15.7	22.5	2.1	4.7
	RBL1			6.4	6.4		77.5		118.7	98.1					11.8	3.9	7.8				
	RBL6			5.9	5.9		66.5		98.3	82.4					13.1	12.7	12.9				
	RBL35						78.0			78.0					11.1	0.0	5.5				
	Minimum	5.2	5.5	4.9	5.5	17.1	54.0	42.3	81.9	59.3	0.3	12.1	0.3	0.6	1.0	3.9	0.3	4.0	12.5	1.0	2.3
	Maximum	9.6	13.7	11.0	10.4	300.0	97.0	133.0	158.5	230.0	18.1	50.2	38.0	40.3	23.4	19.0	26.4	22.7	31.0	3.0	7.0
	Mean	7.4	7.1	6.4	6.9	169.5	79.1	80.7	108.9	114.0	6.8	21.7	12.4	14.4	11.0	11.0	10.7	12.4	20.2	1.7	5.1
	CV(%)	12.1	8.9	9.1	13.2	29.6	8.8	25.9	18.7	29.6	82.3	46.8	60.6	47.8	57.2	0.3	44.4	35.4	20.1	26.5	22.0
	CD (.05)			1.1		NS			39.9		NS			NS		7.4					

Table 91: Characterization of germplasm lines in rice bean at Shimla – Hills (2005)

S. No.	Accession No.	Shimla										
		Quantitative		Qualitative								
		Leaf let size (cm ²)	Stem thickness (mm)	Early Vigour	Growth Habit	Plant Habit	Flower colour	Flowering Behaviour	Leaflet Shape	Pod shuttering	Pod Color	Seed Shape
1	BRS2	135.6	4.3	3	1	1	3	1	2	0	3	1
2	IC330410	135.3	5.4	3	1	1	3	1	2	0	2	1
3	IC335412	109.8	5.6	3	1	1	3	1	2	0	3	1
4	IC342379	116.3	6.4	3	1	1	3	1	2	0	2	1
5	IC374483	174.3	4.3	2	1	1	3	1	2	0	3	1
6	LRB001	155.4	4.2	2	1	1	3	1	2	0	2	1
7	LRB002	113.0	6.4	2	1	1	3	1	2	0	2	1
8	LRB005	112.2	5.4	2	1	1	3	1	2	0	2	1
9	LRB006	121.6	5.5	3	1	1	3	1	2	0	2	1
10	LRB007	162.2	6.5	2	1	1	3	1	2	0	2	1
11	LRB008	145.2	6.3	2	1	1	3	1	2	0	2	1
12	LRB009	116.4	6.2	2	1	1	3	1	2	0	2	1
13	LRB010	120.6	7.4	2	1	1	3	1	2	0	2	1
14	LRB011	128.9	7.3	2	1	1	3	1	2	0	2	1
15	LRB012	105.5	7.4	2	1	1	3	1	2	0	2	1
16	LRB013	114.6	5.3	2	1	1	3	1	2	0	2	1
17	LRB015	98.9	6.2	2	1	1	3	1	2	0	2	1
18	LRB017	124.6	6.4	2	1	1	3	1	2	0	2	1
19	LRB018	125.6	4.2	2	1	1	3	1	2	0	2	1
20	LRB020	153.2	6.9	2	1	1	3	1	2	0	2	1
21	LRB022	132.6	5.4	2	1	1	3	1	2	0	2	1

S. No.	Accession No.	Shimla										
		Quantitative		Qualitative								
		Leaf let size (cm ²)	Stem thickness (mm)	Early Vigour	Growth Habit	Plant Habit	Flower colour	Flowering Behaviour	Leaflet Shape	Pod shuttering	Pod Color	Seed Shape
22	LRB022-2	143.5	6.2	3	1	1	3	1	2	0	2	1
23	LRB023	150.4	4.4	2	1	1	3	1	2	0	2	1
24	LRB026	121.6	4.9	3	1	1	3	1	2	0	2	1
25	LRB030	121.8	6.2	3	1	1	3	1	2	0	2	1
26	LRB034	144.0	4.5	2	1	1	3	1	2	0	2	1
27	LRB035-1	136.4	6.3	2	1	1	3	1	2	0	2	1
28	LRB036	176.8	6.4	2	1	1	3	1	2	0	2	1
29	LRB037	113.6	5.3	3	1	1	3	1	2	0	2	1
30	LRB038	98.6	4.4	3	1	1	3	1	2	0	3	1
31	LRB048	120.0	6.2	2	1	1	3	1	2	0	3	1
32	LRB050	117.4	4.4	3	1	1	3	1	2	0	2	1
33	LRB053	156.2	4.4	2	1	1	3	1	2	0	2	1
34	LRB063	145.5	6.9	3	1	1	3	1	2	0	2	1
35	LRB066	136.0	4.3	3	1	1	3	1	2	0	2	1
36	LRB074-2	134.3	8.2	3	1	1	3	1	2	0	3	1
37	LRB074-3	145.2	7.1	2	1	1	3	1	2	0	2	1
38	LRB075-1	151.2	6.3	3	1	1	3	1	2	0	2	1
39	LRB075-2	136.3	6.5	2	1	1	3	1	2	0	3	1
40	LRB076	135.4	7.5	2	1	1	3	1	2	0	2	1
41	LRB078	114.7	5.2	2	1	1	3	1	2	0	3	1
42	LRB079	121.0	5.9	2	1	1	3	1	2	0	2	1
43	LRB084	136.4	7.4	3	1	1	3	1	2	0	2	1

S. No.	Accession No.	Shimla										
		Quantitative		Qualitative								
		Leaf let size (cm ²)	Stem thickness (mm)	Early Vigour	Growth Habit	Plant Habit	Flower colour	Flowering Behaviour	Leaflet Shape	Pod shuttering	Pod Color	Seed Shape
44	LRB141	135.0	7.9	2	1	1	3	1	2	0	2	1
45	LRB159	168.2	8.5	3	1	1	3	1	2	0	2	1
46	LRB161	150.6	5.2	2	1	1	3	1	2	0	2	1
47	LRB162	105.0	5.5	3	1	1	3	1	2	0	3	1
48	LRB170	108.8	8.5	2	1	1	3	1	2	0	2	1
49	LRB199	112.6	4.4	3	1	1	3	1	2	0	3	1
Means for check varieties												
	PRR1	98.4	5.6	2	1	1	3	1	2	0	2	1
	PRR2	75.7	5.4	3	1	1	3	1	2	0	2	1
	Minimum	75.7	4.2	2	1	1	3	1	2	0	2	1
	Maximum	176.8	8.5	3	1	1	3	1	2	0	3	1
	Mean	129.7	5.9									
	CV(%)	16.1	20.0									

Qualitative Descriptors: Early plant vigour: 1-poor, 2-good, 3-very good 99-others; Plant habit: 1-determinate, 2-semi-determinate, 3-indeterminate, 99-others; Plant growth habit: 1-erect, 2-spreading, 3-trailing, 99-others; Flower colour: 1-white, 2-violet, 3-yellow, 4-red, 5-pink, 6-light brown, 7-dark brown, 99-others; Flowering behavior: 1-asynchronous, 2-synchronous; Leaflet shape: 1-narrow (elongate), 2-intermediate (sub elliptic), 3-rounded (sub orbicular), 99-others; Leaflet size: 1-small, 2-medium, 3-large, 99-others; Pod colour: 1-light yellow, 2-brown, 3-dark brown, 4-black, 99-others; Seed shape: 1-cylindrical, 2-round, 3-flattened, 99-others.

Table 92. Promising lines in Adzuki bean germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Palampur (Accessions 22)				
1.	Days to flowering	37.00-72.00	EC341960, EC340255 (< 61 days)	IC241041(C) (61.5 days)
2.	Days to maturity	61.00-100.00	EC341952, EC015257, EC000251 (< 92 days)	HPAU-51 (93.5 days)
3.	Plant height (cm)	49.00-100.00	EC341952, EC120460, EC187896, EC340284 (> 66.0cm)	IC241041(C) (66.0 cm)
4.	Seed yield (q/ha)	1.29-17.37	EC340247, EC030256 (> 13.5 q/ha)	HPAU-25 (13.2 q/ha)
Shimla (Accessions 24)				
1.	Days to flowering	55.00-68.00	EC015257, EC120460, EC018151, EC000251, EC000254, EC187896, EC030253 (< 59.0 days)	SMLAB-1 (59.5 days)
2.	No. of primary branches	1.60-5.30	EC008707, EC015257, EC000254, EC000251, EC340247, EC340271, EC030253, EC015256, EC341952, EC340264 (> 3.0)	SMLAB-1 (2.3)
3.	No. of clusters per plant	6.30-18.00	EC340264, EC108080, EC340263, EC340284, EC341955, EC015256, EC341952, EC340255 (> 11.60)	HPU-51 (9.30)
4.	No. of pods per cluster	2.60-6.30	EC340264, EC340271, EC108080, EC340284, EC341952, EC290251, EC108080, EC120460, EC015256, EC340247, EC341940, EC187896 (>5.50)	SMLAB-1 (4.45)
5.	No. of pod per plant	17.50-28.30	EC290251, EC187896, EC340264, EC340271, EC000251, EC344625, EC018151, EC340255, EC015257, EC000254, EC108080, EC024523, EC341940 (> 23.60)	SMLAB-1 (22.3)
6.	Plant height (cm)	23.40-57.00	EC008707, EC341952, EC340247, EC000251, EC340284 (> 50.0 cm)	SMLAB-1 (44.3 cm)
7.	Days to maturity	143.00-149.00	EC340247, EC340264, EC341952, EC340284, EC341954, EC340263, EC290251, EC015257 (< 145.0 days)	SMLAB-1 (145.0 days)
8.	No. of seeds per pod	8.00-11.00	EC340284, EC341954, EC341955, EC340271, EC108080 (> 9.60)	SMLAB-1 (9.3)
9.	Seed yield per plant (g)	6.25-22.40	EC340263, EC000254, EC340284, EC340247, EC340271, EC341955, EC015257, EC340264, EC030253, EC008707 (> 15.72 g)	SMLAB-1 (14.11 g)

S.No.	Characters	Range	Promising lines	Highest value of best check
10.	100 seed weight (g)	8.28-17.00	EC340271, EC340284, EC108080, EC290251 (> 12.78 g)	HPU-51 (12.27 g)
Ranichauri (Accessions 13)				
1.	Days to flowering	52.00-60.00	SMLAB 8, IC 241041, SHIMLA 1, SMLAB 5, SMLAB 6, HPAB 21, SMLAB 10 < (58.0 days)	HPU-51 (60.0 days)
2.	Days to maturity	102.00-112.00	SMLAB 8, IC 241041, SHIMLA 1, SMLAB 6, HPAB 21, SMLAB 5, SMLAB 10 < (108.0 days)	HPU-51 (110.0 days)
3.	Plant height (cm)	24.00-47.00	SMLAB 10, SMLAB 4, SMLAB 7 > (35.0 cm)	HPU-51 (32.0 cm)
4.	No. of leaves per plant	16.00-28.50	SMLAB 4 > (26.0)	HPU-51 (26.0)
5.	No. of pod per plant	8.12-21.10	SMLAB 4, SMLAB 10 > (16.0)	HPU-51 (15.1)
6.	No. of seed per plant	4.20-7.25	SMLAB 10, SMLAB 5, SMLAB 4 > (7.0)	HPU-51 (6.0)
7.	Seed yield per plant (g)	16.67-40.00	SMLAB 1 > (35.0 g)	HPU-51 (34.1 g)
Best entries over locations (Pamapur and Shimla)				
1.	Days to flowering	51.00-72.00	EC341955 < (59.0 days)	SMLAB - 1 (59.5 days)
2.	Plant height (cm)	32.70-78.00	EC341952 > (70.0 cm)	IC241041(C) (66.0 cm)

Table 93: Multilocation evaluation of germplasm lines in adzuki bean at Shimla and Palampur – Hills (2005)

S. No.	Accession	Day to flowering			Plant height(cm)			Days to maturity			Shimla							Palampur
		Shimla	Palampur	Mean	Shimla	Palampur	Mean	Shimla	Palampur	Mean	No. of primary branches	No. of clusters /plant	No. of Pod / Cluster	No. of pod /plant	No. of seeds / pod	Seed yield / plant (g)	100 seed wt.(g)	Seed yield (q/ha)
1	EC000251	57.00	69.0	63.0	54.80	53.0	53.9	147.00	92.0	119.5	4.30	10.00	5.00	26.60	8.60	15.38	11.78	6.4
2	EC000254	58.00	66.0	62.0	43.40	66.0	54.7	146.00	96.0	121.0	5.00	9.00	5.30	25.00	9.00	20.75	11.26	3.0
3	EC008707	59.00	71.0	65.0	57.00	62.0	59.5	145.00	97.0	121.0	5.30	11.00	5.30	18.60	8.00	16.38	12.78	3.2
4	EC015256	60.00	65.0	62.5	38.10	64.0	51.1	147.00	97.0	122.0	3.30	12.30	5.60	18.00	8.00	11.60	9.60	4.0
5	EC015257	55.00	65.0	60.0	25.00	54.0	39.5	144.00	92.0	118.0	5.00	11.60	5.30	25.30	9.00	18.05	10.26	13.0
6	EC018151	57.00	71.0	64.0	25.30	58.0	41.7	148.00	96.0	122.0	2.00	11.00	5.30	25.80	8.00	12.50	10.18	5.0
7	EC024523	61.00	72.0	66.5	23.50	51.0	37.3	147.00	97.0	122.0	2.30	10.00	5.00	24.30	9.00	13.32	10.90	9.5
8	EC030253	58.00	62.0	60.0	25.60	52.0	38.8	146.00	97.0	121.5	3.30	10.00	5.30	23.60	9.00	16.70	12.64	13.6
9	EC108080	60.00	69.0	64.5	46.50	64.0	55.3	147.00	95.0	121.0	2.30	18.00	6.00	19.30	10.00	15.72	11.76	2.3
10	EC120460	56.00	72.0	64.0	35.40	71.0	53.2	149.00	96.0	122.5	2.30	9.00	6.00	22.60	9.00	9.50	9.50	12.4
11	EC187896	58.00	62.0	60.0	33.30	70.0	51.7	147.00	97.0	122.0	2.30	10.00	5.60	28.30	8.00	8.80	10.06	5.3
12	EC290251	64.00	69.0	66.5	27.20	49.0	38.1	144.00	98.0	121.0	2.60	11.30	6.00	28.30	9.30	6.60	13.12	3.1
13	EC340247	63.00	69.0	66.0	55.00	66.0	60.5	143.00	96.0	119.5	4.00	11.60	5.60	20.60	9.00	18.62	10.52	13.6
14	EC340255	62.00	61.0	61.5	23.40	66.0	44.7	147.00	95.0	121.0	2.30	12.00	5.30	25.60	9.30	6.25	11.54	4.8
15	EC340263	64.00	67.0	65.5	29.70	64.0	46.9	144.00	100.0	122.0	2.60	16.60	5.30	21.60	9.00	21.75	10.20	3.4
16	EC340264	62.00	71.0	66.5	29.80	52.0	40.9	143.00	96.0	119.5	3.30	18.00	6.30	27.00	9.60	16.89	10.66	4.8
17	EC340271	63.00	69.0	66.0	43.00	60.0	51.5	146.00	100.0	123.0	3.60	10.30	6.30	27.00	10.00	18.33	17.00	4.8
18	EC340284	62.00	69.0	65.5	53.60	69.0	61.3	144.00	97.0	120.5	2.30	15.30	6.00	23.30	11.00	20.30	14.42	4.9
19	EC341940	68.00		68.0	32.70		32.7	146.00		146.0	2.00	10.30	5.60	24.00	8.60	11.76	10.10	
20	EC341952	61.00	71.0	66.0	56.00	100.0	78.0	144.00	61.0	102.5	3.30	12.00	6.00	17.60	9.00	15.37	8.28	1.3
21	EC341954	64.00		64.0	40.30		40.3	144.00		144.0	2.00	7.00	2.60	22.30	10.30	10.42	12.04	

S. No.	Accession	Day to flowering			Plant height(cm)			Days to maturity			Shimla							Palampur
		Shimla	Palampur	Mean	Shimla	Palampur	Mean	Shimla	Palampur	Mean	No. of primary branches	No. of clusters /plant	No. of Pod / Cluster	No. of pod /plant	No. of seeds / pod	Seed yield / plant (g)	100 seed wt.(g)	Seed yield (q/ha)
22	EC341955		66.0	66.0		62.0	62.0		100.0	100.0								1.5
23	EC341958		72.0	72.0		52.0	52.0		96.0	96.0								3.0
24	EC341955	65.00	37.0	51.0	23.60	59.0	41.3	145.00	97.0	121.0	2.00	13.30	5.30	21.00	10.30	18.08	11.42	3.8
25	EC344625	66.00		66.0	34.30		34.3	147.00		147.0	1.60	6.30	3.30	26.30	9.30	13.88	11.40	
Means for check varieties																		
	HPU25 (C)		63.0	63.0		61.5	61.5		96.0	96.0								13.2
	HPU27 (C)		63.0	63.0		56.0	56.0		95.5	95.5								8.5
	HPU-51	61.00	70.0	65.5	35.75	55.0	45.4	146.50	93.5	120.0	2.30	9.30	3.95	17.50	9.00	22.4	12.27	6.8
	IC241041(C)		61.5	61.5		66.0	66.0		95.0	95.0								7.4
	SMLAB-1	59.5		59.5	44.3		44.3	145		145.0	2.3	8	4.45	22.3	9.3	14.115	12.23	
	Minimum	55.00	37.00	51.00	23.40	49.00	32.70	143.00	61.00	95.00	1.60	6.30	2.60	17.50	8.00	6.25	8.28	1.29
	Maximum	68.00	72.00	72.00	57.00	100.00	78.00	149.00	100.00	147.00	5.30	18.00	6.30	28.30	11.00	22.40	17.00	13.62
	Mean	60.94	66.25	63.82	37.46	61.63	49.80	145.66	94.92	119.57	2.94	11.33	5.27	23.27	9.14	14.94	11.44	6.25
	SD	3.27	6.97	3.64	11.38	10.12	10.61	1.61	7.20	14.06	1.06	3.01	0.89	3.34	0.76	4.49	1.77	3.95
	CV(%)	5.36	10.53	5.71	30.37	16.42	21.30	1.11	7.58	11.76	35.91	26.60	16.80	14.35	8.32	30.05	15.45	63.21

Table 94: Evaluation of germplasm lines in adzuki bean at Ranichauri – Hills (2005)

S. No.	Entry	Days to 50% flowering	Days to maturity	Plant height (cm)	Pod length (cm)	No. of leaves / plant	No. of pod /plant	No. of seed / plant	Seed yield /plant (g)
1	HPAB 21	56.00	104.00	30.00	9.00	20.00	16.00	6.15	32.40
2	SMLAB 1	60.00	110.00	24.00	8.00	24.00	10.50	5.70	40.00
3	SMLAB 2	58.00	108.00	26.00	11.00	16.00	12.70	5.00	23.43
4	SMLAB 5	55.00	105.00	31.00	9.00	18.50	10.12	7.10	28.88
5	SMLAB 7	58.00	110.00	40.00	7.00	21.50	15.10	5.50	20.33
6	SMLAB 8	52.00	102.00	30.00	9.00	26.00	12.10	6.00	24.10
7	SMLAB 9	60.00	112.00	27.00	7.00	16.45	10.00	4.20	16.67
8	SMLAB 10	56.00	105.00	47.00	11.00	18.75	20.05	7.25	28.78
9	SMLAB 4	58.00	108.00	45.00	9.00	28.50	21.10	7.00	30.12
10	SMLAB 6	55.00	104.00	34.00	10.00	25.00	14.12	6.12	21.24
11	SHIMLA 1	54.00	104.00	32.00	8.00	16.85	8.12	5.40	26.16
12	SHIMLA 3-A1	60.00	112.00	30.00	7.00	20.00	10.75	4.50	18.50
13	IC 241041	53.00	102.00	35.00	9.00	24.75	12.16	5.35	20.00
Means for check varieties									
	HPU 51 ©	60.00	110.00	32.00	11.00	26.00	15.10	6.00	34.10
	Minimum	52.00	102.00	24.00	7.00	16.00	8.12	4.20	16.67
	Maximum	60.00	112.00	47.00	11.00	28.50	21.10	7.25	40.00
	Mean	56.79	106.86	33.07	8.93	21.59	13.42	5.81	26.05
	SD	2.75	3.55	6.75	1.44	4.08	3.78	0.92	6.68
	CV (%)	4.84	3.32	20.42	16.12	18.92	28.17	15.77	25.64

Table 95: Characterization of germplasm lines in adzuki bean at Shimla – Hills (2005)

S. No.	Accession	Qualitative											
		Early Plant vigour	Plant habit	Plant growth habit	Leaf colour	Leaf surface	Leaf let Shape	Flower colour	Stem Colour	Stem Surface	Pod angle	Pod surface	Seed coat colour
1	EC000251	2	1	1	1	1	1	2	3	1	1	1	4
2	EC000254	2	1	1	1	1	1	2	3	1	1	1	4
3	EC008707	2	1	1	1	1	1	2	3	1	1	1	4
5	EC015256	1	1	1	1	1	1	2	3	1	1	1	4
4	EC015257	1	1	1	1	1	1	2	3	1	1	1	3
8	EC018151	2	1	1	1	1	1	2	3	1	1	1	99
7	EC024523	2	1	1	1	1	1	2	3	1	1	1	4
6	EC030253	1	1	1	1	1	1	2	3	1	1	1	4
11	EC108080	3	1	1	1	1	1	2	3	1	1	1	4
22	EC108080	3	1	1	1	2	1	2	3	1	1	1	4
9	EC120460	2	1	1	1	1	1	2	3	1	1	1	4
10	EC187896	2	1	1	1	1	1	2	3	1	1	1	4
14	EC290251	2	1	1	1	2	1	2	3	1	1	1	3
15	EC340247	2	1	1	1	2	1	2	3	1	1	1	99
16	EC340255	2	1	1	1	2	1	2	3	1	1	1	4
17	EC340263	3	1	1	1	2	1	2	3	1	1	1	4
18	EC340264	2	1	1	1	2	1	2	3	1	1	1	3
20	EC340271	2	1	1	2	2	1	2	2	1	1	1	99
21	EC340284	2	1	1	2	2	1	2	3	1	1	1	4
13	EC341940	2	1	1	1	1	1	2	3	1	1	1	4
12	EC341952	2	1	1	1	2	1	2	3	1	1	1	3

S. No.	Accession	Qualitative											
		Early Plant vigour	Plant habit	Plant growth habit	Leaf colour	Leaf surface	Leaf let Shape	Flower colour	Stem Colour	Stem Surface	Pod angle	Pod surface	Seed coat colour
24	EC341954	3	1	1	1	2	1	2	3	1	1	1	4
19	EC341955	3	1	1	1	2	1	2	3	1	1	1	4
23	EC344625	2	1	1	1	2	1	2	3	1	1	1	4
Mean for check varieties													
	HPU-51	2	1	1	1	2	1	2	3	1	1	1	3
	SMLAB-1	2	1	1	1	1	1	2	3	1	1	1	4

Qualitative Descriptors: Early plant vigour: 1-poor, 2-good, 3-very good; Plant habit: 1-determinate, 2-indeterminate, 99-others; Plant growth habit: 1-erect, 2-spreading, 99-others; Leaf colour: 1-yellowish green, 2-green, 3-dark green, 99-others; Leaf surface: 1-glabrous, 2-pubescent, 99-others; Leaflet shape: 1-entire, 2-lobed, 99-others; Flower colour: 1-light yellow, 2-yellow, 3-orange, 99-others; Stem colour: 1-light yellow, 2-purple, 3-green, 99-others; Stem surface: 1-glabrous, 2-pubescent, 99-others; Pod angle: 1-erect, 2-pendent, 99-others; Pod surface: 1-glabrous, 2-pubescent, 99-others; Seed coat colour: 1-green, 2-brown, 3-maroon, 4-red, 99-others.

Table 96. Promising lines in Coix (Ratoon) germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Ranichauri (Accessions 20)				
1.	Plant height (cm)	123.8-313.0	BDS1872, RVN90, H3767 > (260.0 cm)	
2.	No. of tillers per plant	3.0-7.0	H306, BD03, H626 > (5.0)	
3.	Green forage yield (q/ha)	56.0-304.0	RVN90, H306, H3768 > (180.0 q/ha)	
4.	Dry forage yield (q/ha)	8.1-31.0	RVN90, H306, H3638 > (25.0 q/ha)	
5.	Seed yield (q/ha)	1.5-9.4	RVN90, H2279, H696 > (6.0 q/ha)	
Shillong (Accessions 45)				
1.	Plant height (cm)	184.0-420.0	No accessions	MAYEUN (420.0 cm)
2.	No. of tillers	1.0-3.5	UR-29, BDS-1870, H-2215, FDI/AP-01, H-547, FDI-RS/108, H-2279, H-2287, CX-24 > (2.7)	Pollin (2.7)
3.	No. of brace roots	0.3-2.8	H-3638, H-2287, UR-29, H-2215, DRLT-1560, HM-2902, DKH-07, FDI-RS/124 > (2.2)	Pollin (1.8)
4.	No. of nodes	9.3-22.5	H-3638, MNC-01, FDI-RS/124, H-2279, H-2287, H-626, H-3768 > (12.8)	Mayeun (12.7)
5.	Grain yield (q/ha)	2.7-69.4	DRLT-1560, H-303, HM-2902, H-2279, H-626, AAH/33, DKH-07, H-547, H-3768, H-2215, NH 6/22 > (19.4 q/ha)	Pollin (18.1 q/ha)
6.	Days to maturity	66.0-73.0	UR-29, BDS-1868, H-2213, FDI-RS/124, MNCH-03, H-547, H-2215, H-732, SS/AKM-67, H-3767, FDI/AP-01, SS/AKM-96, H-557, MNC-01 < (69.0 days)	Pollin (70.0 days)

Table 97: Evaluation of germplasm lines in coix at Ranichauri – Hills (2005)

S. No.	Entry	Plant height (cm)	No. of tillers / plant	Green forage yield (q/ha)	Dry forage yield (q/ha)	Seed yield (q/ha)
1	BD 03	201.5	6.0	165.0	21.5	3.8
2	BDS 1868	150.5	3.5	92.0	9.8	2.0
3	BDS 1870	124.0	4.0	64.0	8.1	2.4
4	BDS 1872	313.0	3.0	104.0	11.2	6.3
5	DKH 07	125.8	3.0	108.0	15.5	2.0
6	H 2279	123.8	3.5	66.0	8.5	8.8
7	H 2333	252.8	4.5	160.0	20.0	6.1
8	H 305	191.3	3.5	158.0	18.0	3.1
9	H 306	248.0	7.0	246.0	28.5	6.8
10	H 3638	225.5	3.5	186.0	26.0	4.0
11	H 3767	265.0	4.0	157.0	16.8	2.3
12	H 3768	199.3	4.0	190.0	20.9	5.8
13	H 547	243.0	3.0	136.0	19.5	4.4
14	H 557	136.8	3.0	56.0	8.5	1.7
15	H 626	149.5	6.0	78.0	10.0	1.5
16	H 696	237.2	3.0	120.0	14.8	6.9
17	HM 3026	164.3	4.5	124.0	19.4	5.0
18	NH6/22	232.8	3.5	112.0	15.3	6.9
19	RSFDI/342	165.8	5.5	117.8	16.5	1.8
20	RVN 90	270.5	3.5	304.0	31.0	9.4
	Minimum	123.8	3.0	56.0	8.1	1.5
	Maximum	313.0	7.0	304.0	31.0	9.4
	Mean	201.0	4.1	137.2	17.0	4.5
	SD	56.5	1.2	62.0	6.6	2.5
	CV(%)	28.1	28.8	45.2	39.1	54.4

Table 98. Evaluation of germplasm lines in coix, Shillong

S.No.	Collector No.	Accessions No.	Plant stand (%)	Plant ht. (cm)	No. of tillers	No. of brace roots	No. of nodes	Leaf (LXB) (cm)	Grain colour	Grain hard/soft shelled	Grain yield (q/ha)	Days to maturity
1	BDS-1868	IC006645	43.5	326.5	2.0	0.3	10.8	44.70x5.80	Brown	Soft	19.4	67.0
2	BDS-1870	IC006667	54.0	332.5	3.4	1.7	10.7	135.52x6.90	Light Brown	Hard	12.5	70.0
3	H-2213	IC012637	40.5	287.8	2.5	2.0	10.2	84.03x6.28	Light Brown	Soft	15.6	67.0
4	H-2215	IC012639	59.0	344.1	3.0	2.5	12.3	80.52x6.55	Brown	Hard	21.9	68.0
5	H-2279	IC012703	56.0	365.0	2.8	1.8	13.3	82.42x7.10	Brown	Hard	33.8	69.0
6	H-2287	IC012711	49.0	319.2	2.8	2.7	13.0	78.76x5.81	Light Brown	Hard	19.4	69.0
7	HM-2902	IC022156	43.0	287.3	2.5	2.5	11.8	82.66x6.40	Light Brown	Soft	34.4	70.0
8	HM-3026	IC022280	58.0	361.7	2.7	1.3	12.3	84.51x6.67	Cream	Soft	2.7	70.0
9	H-305	IC089381	57.0	295.0	2.2	2.0	12.8	83.08x6.31	Cream	Soft	18.8	69.0
10	H-300	IC089382	40.0	284.8	2.5	1.7	11.2	78.08x5.93	Cream	Soft	19.1	70.0
11	DKH-07	IC089383	53.0	347.5	2.5	2.3	12.5	92.37x6.30	Cream	Soft	26.6	70.0
12	H-303	IC089384	63.5	353.3	2.7	1.8	12.7	70.42x6.75	Brownish	Hard	37.5	70.0
13	AAH/33	IC089385	38.0	347.5	2.5	1.3	11.7	83.66x5.90	Cream	Soft	31.3	69.0
14	H-306	IC089387	77.5	256.7	2.3	2.0	12.6	79.50x6.38	Cream	Hard	18.1	73.0
15	H-626	IC089389	61.0	336.0	2.3	2.2	13.0	83.12x6.48	Cream	Soft	32.5	69.0
16	H-732	IC089390	46.0	310.3	2.7	1.8	12.2	69.32x5.93	Cream	Hard	18.8	68.0
17	H-696	IC089391	41.0	329.3	2.2	2.0	10.8	75.44x6.68	Light Brown	Soft	15.8	70.0
18	H-656	IC089392	49.0	264.2	2.5	1.8	10.7	78.86x5.57	Light Brown	Soft	11.6	71.0
19	H-547	IC089393	59.5	338.3	3.0	1.8	12.3	84.25x5.90	Light Brown	Hard	23.8	68.0
20	H-557	IC089394	40.0	184.0	1.8	1.7	11.0	77.80x5.85	Light Brown	Hard	7.3	68.0
21	FDI-RS/124	IC149466	30.0	381.7	2.0	2.3	14.2	81.85x5.89	Dusky Brown	Hard	9.4	67.0
22	H-3767	IC203984	59.0	333.3	2.2	2.0	12.2	81.35x6.75	Dusky Brown	Hard	15.3	68.0
23	H-3768	IC203985	71.0	381.5	2.7	1.4	13.0	89.78x6.55	Dusky Brown	Soft	22.2	69.0
24	H-3638	IC204184	51.0	324.8	2.0	2.8	22.5	79.75x6.40	Dusky Brown	Hard	16.0	72.0
25	FDI/AP-01	IC334314	48.5	343.3	3.0	2.0	12.2	83.03x6.58	Light Brown	Hard	12.0	68.0

S.No.	Collector No.	Accessions No.	Plant stand (%)	Plant ht. (cm)	No. of tillers	No. of brace roots	No. of nodes	Leaf (LXB) (cm)	Grain colour	Grain hard/soft shelled	Grain yield (q/ha)	Days to maturity
26	CX-24	IC340015	43.0	307.2	2.8	1.7	11.3	81.87x5.38	Blackish	Hard	8.5	71.0
27	AKD-RS-GD-113	IC360719	50.5	268.0	1.5	1.0	10.3	70.00x5.58	Blackish	Hard	15.0	72.0
28	RD-128	IC374506	45.0	363.3	1.8	1.3	11.7	64.88x5.62	Light Brown	Soft	7.0	70.0
29	DRLT-1487	IC416824	40.5	288.3	1.5	1.5	12.7	57.43x6.06	Light Brown	Soft	11.9	71.0
30	DRLT-1492	IC416829	50.0	292.0	1.0	1.5	12.5	75.39x7.06	Light Brown	Soft	10.8	73.0
31	DRLT-1494	IC416831	37.0	285.8	1.5	1.0	11.0	61.58x5.39	Light Brown	Soft	5.6	72.0
32	DRLT-1528	IC416868	38.0	267.7	1.3	1.0	11.8	62.28x5.55	Brown	Hard	6.6	72.0
33	DRLT-1547	IC416884	45.5	331.2	1.7	1.7	11.5	83.53x5.85	Brown	Hard	7.8	70.0
34	DRLT-1560	IC416897	54.5	335.8	2.5	2.5	12.8	83.00x6.26	Cream	Soft	69.4	70.0
35	UR-121	IC416971	52.5	263.0	2.5	1.7	10.8	77.01x5.64	Creamy	Soft	11.3	69.0
36	UR-29	IC417053	9.5	250.0	3.5	2.5	9.3	70.12x6.77	Creamy	Soft	8.8	66.0
37	FDI-RS/108	IC419448	51.0	261.8	3.0	1.3	10.2	80.27x6.35	Blackish Brown	Soft	11.3	69.0
38	NH 6/22	IC521338	55.0	337.5	2.3	2.0	11.8	85.60x6.04	Blackish Brown	Hard	21.9	69.0
39	BD-03	IC521339	48.5	257.5	1.8	0.7	11.8	83.33x6.23	Brown	Soft	15.6	71.0
40	BDS-865	IC521340	53.0	278.6	1.8	1.7	11.3	32.50x5.65	Cream	Soft	15.6	70.0
41	MNCH-02	IC521341	44.5	297.2	1.8	1.5	10.7	84.36x6.45	Blackish	Hard	11.6	70.0
42	MNC-01	IC521342	46.5	262.5	2.3	1.0	17.7	72.80x6.04	Blackish	Hard	3.2	68.0
43	MNCH-03	IC521343	29.5	300.3	1.7	1.0	12.3	77.6x6.01	Brown	Soft	6.3	67.0
44	SS/AKM-67	IC524599	55.0	268.2	2.7	1.3	10.0	88.31x6.83	Brown	Soft	16.3	68.0
45	SS/AKM-96	IC524631	39.5	321.7	2.2	1.7	12.8	79.9x6.80	Brownish	Soft	10.3	68.0
Means for check varieties												
	POLLIN (C)		51.5	351.7	2.7	1.8	11.3	75.00x5.96	Cream	Hard	18.1	70.0
	MAYEUN (C)		55.5	420.0	2.3	1.7	12.7	83.84x6.28	Light Brown	Soft	11.9	71.0
	Maximum		77.5	420.0	3.5	2.8	22.5				69.4	73.0
	Minimum		9.5	184.0	1.0	0.3	9.3				2.7	66.0
	Mean		48.6	311.6	2.3	1.7	12.1				17.0	69.5
	CV%		22.9	14.1	23.2	30.6	16.8				67.0	2.4

Table 99. Promising lines in Perilla germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Best value of best check
Ranichauri (Accessions 20)				
1.	Days to 50% flowering	115.0-145.0	BDS 1647, BDS 1650 < (120.0 days)	
2.	Days to maturity	160.0-188.0	BDS 1647, BDS 1650 < (165.0 days)	
3.	Plant height (cm)	45.15-98.40	BDS 1649, BDS 1647 > (84.0 cm)	
4.	No. of primary branches	5.45-11.50	RD 074, BDS 1649 > (9.0)	
5.	No. of finger per plant	15.0-32.0	RD 071, H 1812 > (29.0)	
6.	Finger length (cm)	3.80-8.80	H 0664, RD 074 > (8.0 cm)	
7.	No. of leaves per plant	18.10-32.40	H 1812, H 1756 > (30.0)	
8.	Plant girth at base (cm)	0.50-0.95	H 1812, NH6/10 > (0.90 cm)	
9.	Seed yield per plant (g)	12.75-22.40	H 1812, RD 029 > (20.0 g)	
Shillong (Accessions 20)				
1.	Days to maturity	196.5-213.0	No accessions	Local (196.50 days)
2.	Plant height (cm)	151.8-293.3	H-3944, BDS-1649, GP-178, H-1756, BDS-1647, BDS-1650 > (265.0 cm)	BDS-1649 (238.20 cm)
3.	No. of primary branches per plant	11.1-20.6	No accessions	BDS-1649 (20.55)
4.	Seed yield per plant (g)	2.6-34.0	BDS-1650, BDS-1644, H-1143, H-3944, BDS-1647, H-1756, H-1099, H-56, H-664, H-1812, GP-178, BDS-1649, H-1796, NH-6/10, RD-74, H-2216, RD- 1, H-621, RD-29 > (8.0 g)	
5.	Seed yield (q/ha)	0.5-15.3	BDS-1644, H-3944, BDS-1647, H-1756 > (12.0 q/ha)	H-1748 (11.25 q/ha)

Table 100. Evaluation of germplasm lines in perilla at Ranichauri – Hills (2005)

S. No.	Entry No.	Days to 50% flowering	Days to maturity	Plant height (cm)	No. of primary branch	No. of finger /plant	Finger length (cm)	No. of leaves /plant	Plant girth at base (cm)	Seed yield / plant (g)
1	BDS1647	115.00	160.00	85.50	9.50	15.00	7.00	21.00	0.50	20.12
2	BDS1649	120.00	165.00	98.40	10.00	18.50	8.60	18.50	0.75	16.40
3	BDS1650	115.00	160.00	80.80	8.75	20.00	8.00	28.00	0.85	18.27
4	GP178	125.00	170.00	74.00	7.60	16.80	7.20	26.75	0.75	14.56
5	H0556	130.00	175.00	54.20	8.50	21.45	5.60	25.00	0.50	12.75
6	H0621	130.00	176.00	60.80	6.75	28.40	6.40	20.40	0.65	17.23
7	H0664	135.00	180.00	46.50	8.00	16.50	8.80	22.70	0.85	14.10
8	H1099	132.00	177.00	45.15	5.45	21.40	7.00	24.15	0.50	20.50
9	H1143	120.00	165.00	48.60	8.90	15.80	5.70	25.60	0.50	16.12
10	H1644	122.00	166.00	50.00	6.40	20.00	5.50	18.10	0.65	18.40
11	H1756	125.00	170.00	52.35	5.60	24.50	7.80	30.12	0.75	21.75
12	H1796	128.00	178.00	60.00	5.80	18.60	6.20	26.00	0.80	15.12
13	H1812	130.00	175.00	55.60	6.80	30.50	3.80	32.40	0.95	22.40
14	H2216	144.00	188.00	47.80	6.60	26.10	4.60	30.00	0.90	18.16
15	H3944	145.00	188.00	58.85	6.50	25.00	6.20	25.60	0.85	21.70
16	NH6/10	135.00	180.00	65.50	8.75	17.10	7.20	25.75	0.95	16.30
17	RD029	115.00	160.00	47.80	9.00	30.00	6.60	28.60	0.85	22.12
18	RD071	130.00	175.00	45.50	10.00	32.00	6.40	26.40	0.90	20.00
19	RD074	115.00	160.00	54.75	11.50	28.00	8.60	22.50	0.88	17.15
20	RD117	135.00	174.00	51.60	8.00	21.75	5.00	20.00	0.75	20.40
Minimum		115.00	160.00	45.15	5.45	15.00	3.80	18.10	0.50	12.75
Maximum		145.00	188.00	98.40	11.50	32.00	8.80	32.40	0.95	22.40
Mean		127.30	172.10	59.19	7.92	22.37	6.61	24.88	0.75	18.18
SD		9.10	8.78	14.73	1.66	5.35	1.36	3.97	0.15	2.88
CV(%)		7.15	5.10	24.89	21.01	23.92	20.56	15.95	20.50	15.84

Table 101. Evaluation of germplasm lines in Perilla, Shillong

S. No.	Collector's No.	Accessions No.	Days to maturity	Plant height (cm)	No. of primary branches/ plant	Seed yield/ plant (gm)	Seed Yield (q/ha)
1	BDS-1644	IC-006441	199.0	254.17	15.00	30.58	15.3
2	BDS-1647	IC-006444	198.0	279.33	18.65	27.21	12.4
3	BDS-1649	IC-006446	210.0	291.00	18.10	15.23	4.7
4	BDS-1650	IC-006447	206.5	271.00	20.15	34.00	10.5
5	GP-178	IC-521286	213.0	290.00	14.30	18.00	7.3
6	H-556	IC-521285	205.5	251.84	13.45	23.18	4.5
7	H-621	IC-521283	207.0	233.17	11.10	8.67	3.6
8	H-664	IC-521281	199.0	201.67	14.10	21.40	5.3
9	H-1099	IC-521284	198.5	233.00	16.30	23.29	8.3
10	H-1143	IC-521282	199.5	204.83	13.15	30.46	10.1
11	H-1756	IC-003913	207.5	282.17	18.65	24.50	12.2
12	H-1796	IC-003942	207.0	264.67	13.45	14.29	7.1
13	H-1812	IC-003955	199.0	264.33	13.15	18.03	9.5
14	H-2216	IC-012640	210.5	222.67	12.80	9.44	6.8
15	H-3944	IC-211608	198.0	293.33	13.30	28.31	13.8
16	NH-6/10	IC-521287	205.0	244.50	14.95	12.31	6.2
17	RD-29	IC-374543	204.5	205.83	13.15	8.07	3.7
18	RD-71	IC-374590	204.5	171.83	12.45	9.33	3.9
19	RD-74	IC-374593	201.5	228.33	11.10	10.79	5.2
20	RD-117	IC-374494	211.5	164.50	14.15	2.62	0.5
Means for Checks Varieties							
	BDS-1649	IC-006446	204.67	238.20	20.55		7.9
	H-1748	IC-003708	198.33	195.33	16.11		11.3
	FDI/AP-02	IC-334313	197.00	200.22	18.31		7.3
	LOCAL		196.50	151.83	18.50		9.4
	Minimum		196.5	151.8	11.1	2.6	0.5
	Maximum		213.0	293.3	20.6	34.0	15.3
	Mean		203.4	234.9	15.2	18.5	7.8
	CV%		2.5	17.6	18.4	48.7	46.5

3.2 PLAINS

Multilocational germplasm evaluation was planned to be conducted on grain amaranth, rice bean, faba bean, winged bean, Tumba, Kalingada, Jatropha and Simarouba. The germplasm accessions were evaluated in augmented design with standard check cultivars.

3.2.1 Grain Amaranth (Rabi 2004-05)

Germplasm screening nursery consisting of 50 lines was planned to be evaluated at five locations viz. NBPGR New Delhi; RAU Mandor, HAU Hisar, PAU Ludhiana and GAU S.K. Nagar. The results were received from only three locations. The checks used were Annapurna and Suvarna at Delhi; Annapurna, GA-1, GA-2 and Suvarna at Hisar and GA1 and GA2 at S.K. Nagar. The list of promising for all characters have been presented in table 102.

A set of 64 accessions including checks were evaluated for seven quantitative and three qualitative characters at New Delhi. Genotype IC394084 (34.41 q/ha) was found for highest yielder. The maximum plant height (106.00 cm) was observed in the accessions IC398495 followed by IC398488 (99.4 cm). The highest no. of branches was recorded in accession IC 398496 followed by IC398471. The longest inflorescence (79.3 cm) was recorded in the genotype IC444173 followed by IC444165 (71.6 cm). The statistical parameter for all the characters have been given in table 103. The accession IC394083 had highest number of inflorescence (35) IC444171 (29.00 days) and IC444176 (29.00 days) were earliest in flowering and IC344699 (149.00 days) was earliest in maturity.

A total of 67 accessions were also evaluated at CCS HAU, Hisar for seven quantitative characters. Statistical parameters have been given in table 104. IC35538 (60 days) and IC35567 (62 days) was earliest in flowering and IC35598 (191 days) was earliest in maturity. The maximum plant height (122.72 cm) was observed in the accession IC35735 followed by RMA-7 (115.6 days). The entry IC21925 (11.6) had the highest number of branches per plant. The longest panicle length was found in IC35370 (37.5 cm) followed by IC35593 (37.00 cm). The entry PRA-2004 (8.9 g) followed by RMA-8 (8.5 g) had the

highest test weight. The highest grain yield per plant was observed in genotype RMA-8 (81.8 g) followed by PRA-2004.

A set of 40 genotypes including two checks were screened for four yield related attributes and eight qualitative characters at GAU, S.K. Nagar. No entry was found earlier to the check variety. The maximum height (182.0 cm) was found in the genotype RYM-26 followed by RYM-23 (178.00 cm). The genotype RMY-31 had the longest inflorescence length (103.7 cm). No entry was superior to the check for yield per plant. The mean and range for all characters have been given in table 105.

3.2.2 Grain Amaranth (Kahrif 2005)

Germplasm screening nursery consisting of 50 accessions supplied by N.B.P.G.R., Shimla was to be evaluated at three locations viz. UAS, Bangalore, MPKV, Rahuri and TNAU, Mettupalayam. The data were received from all the three locations. The checks used were Annapurna, GA1, GA2 and Suvarna. The list of promising for all characters have been presented in table 106 and the range and means in table 107.

At Bangalore, a set of 50 genotypes were evaluated for five quantitative characters. The genotype EC519554 (152.0 cm) followed by EC519522 (149.0 cm) had the maximum height. The longest inflorescence (53.00 cm) was recorded in the genotype IC415448 followed by EC519558 (51.00 cm). IC415318 and IC423410 (29 days) were earliest in flowering and IC423410, IC423548, IC415293 and IC415252 (60 days) were found early in maturity. No entry was found superior to the check variety in seed yield per plant (g).

A total of 50 genotypes were also evaluated at Mettupalayam for five yield attributes. EC519558 (192.8 cm) was found for maximum height followed by EC519554 (175.4 cm). The longest panicle length (76.00 cm) was recorded in the genotype EC519558 followed by EC519542 (57.8 cm). IC415297, EC415317, IC415243 (30 days) was earliest in flowering and maturity (62 days). The genotype IC415236 (20.0 g) was observed as highest yielder per plant.

At Rahuri, a set of 50 genotypes were evaluated for nine characters. IC423400 (32.0 days) was earliest in flowering. The maximum plant height

(192.8 cm) was found in EC519554 and EC524457 followed by EC519549 (168.0 cm). The longest inflorescence length was found in EC519549 (60.0 cm) followed by EC519543 (54.0 cm). The entry IC415220 had the highest test weight while IC415331 and EC519558 had the highest seed yield (37.04 q/ha).

Based on average over the locations, the best entry for different characters have been given as below.

Flowering time was the earliest at Bangalore (29.0 days) followed by Mettupalayam (30.0 days), while it was moderate at Rahuri. The entry IC423410 showed early flowering (37.7 days) and maturity (71.00 days) as compared to checks based on the average over all the three locations.

The plant height was highest at Mettupalayam (70.1 cm) and lowest at Bangalore (36.0 cm). Based on the average over the locations, the entry EC519554 (165.5 cm) had the highest plant height followed by EC519522 (154.3 cm).

The length of inflorescence of the entries was highest at Mettupalayam (34.6 cm) and lowest at Rahuri (18.00 cm). Based on the average over three locations, the entry EC519558 (53.00 cm) had longest inflorescence followed by EC519531 (49.00 cm).

Grain yield per plant was highest at Mettupalayam and lowest at Bangalore. Based on the average over two locations, no entry was superior to the check entry for grain yield per plant.

3.2.3 Rice bean (*Vigna umbellata*)

In rice bean 100 genotypes supplied by PAU Ludhiana were planned to be evaluated at seven locations viz. PAU Ludhiana; OUA&T Bhubaneswar; UAS, Bangalore; MPKV, Rahuri; NBPGR, Delhi; BAU, Ranchi and GAU, S.K. Nagar. The list of promising for all characters have been presented in table 108 and statistical parameters for all the characters of different locations have been presented in table 109.

A total of 120 genotypes and three checks RBL-1, RBL-6 and RBL-35 were screened for 11 characters in Augmented Design at OUA&T Bhubaneswar. The

entries were statistically significant for seven characters out of the eleven characters. All the genotypes flowered in 43.00 – 51.00 days and matured in 89-102.00 days. The maximum plant height (89.2 cm) was observed in LRB031 followed by BRB08 (87.2 cm). The entries BRB20 (5.00) and LRB047 had the highest number of branches per plant, while entry BRB06 (47.2) had the highest number of pods per plant. The longest pod was recorded in genotype LRB050 (9.9 cm) followed by BRB03 (9.8 cm). The entry LRB065 (9.21 g) had the bold seeds followed by BRB13 (7.99 g). The highest seed yield per plant (17.36 g) was recorded in the genotype BRB10.

At Bangalore, a set of 100 genotypes were evaluated for six characters. The maximum plant height (69.6 cm) was observed in the genotype LRB118 followed by LRB99 (67.9 cm). The entries LRB-1 (2.4) and LRB-71-1 had the highest number of branches per plant, while entry LRB-63 (39.3) had the maximum number of pods per plant. LRB 54, LRB 25, LRB 21-2, LRB 29-1, LRB 28, LRB 19 and LRB 94 had flowered one day earlier to the check. The entry LRB114 (72.00 days) was earlier in maturity followed by LRB-35 (75.00 days). No entry was superior to the check in seed yield per plant.

At Delhi, a set of 124 genotypes and three checks RBL-1, RBL-6 and RBL-35 were evaluated in Augmented Design for 12 characters. The entries of two characters out of twelve characters (no. of branches per plant and 100 seed weight) was found significant. LRB 28 (40.00 days) was found to be early flowering. No entry had longer pod than the check. The maximum number of seeds per pod was recorded in the genotype LRB-45 (18.0 g) followed by LRB-15 (11.2 g). The entries LRB-47 (102 days) and IC364080 (112 days) were earlier in maturity. Maximum plant height (185.4 cm) was observed in the genotype LRB-109 followed by LRB-114 (170.00 cm). The entry DRRP-57 (9.32) had the highest number of branches per plant. The entry LRB-43 (95.00 g) had the highest seed yield per plant, while the entry LRB-73-1 (32.8 q/ha) had the highest seed yield in term of (q/ha). Bold seed was recorded in the genotypes LRB-21 (6.75 g) and LRB-46 (6.5 g). Maximum number of pods was observed in LRB-53 (133.0) followed by LRB-104 (106.2), while LRB-85 (5.6) and LRB-71-2 (5.4) had the higher number of pods per cluster.

A set of 103 accessions and three checks RBL-1, RBL-6 and RBL-35 were evaluated in Augmented Design for seven yield related attributes at PAU, Ludhiana. Six entries had flowered earlier than check at this centre. The maximum plant height (144.00 cm) was recorded in the genotype LRB-89 followed by LRB-50 (137.00 cm).

The entries LRB 66 (8.6 g) and LRB 114 (8.5 g) had the bold seeds, while LRB28 (35.0 q/ha) and LRB102 (32.9 q/ha) were the top yielder genotypes.

A set of 100 accessions and three checks were evaluated in Augmented Design for nine characters at MPKV, Rahuri. No entry was earliest in flowering, while LRB49 (59 days) had the earliest in maturity followed by LRB-741 (67 days). The maximum height (157.00 cm) was recorded in the genotypes LRB-7 followed by LRB 66 (149.00 cm). The entries LRB104 and LRB119 (52.00) had the highest number of pods per plant. The bold seeds were observed in the genotypes LRB12 (5.8 g) and LRB13 (5.7 g). The top yielder accessions were LRB04 (17.22 q/ha) and LRB22 (16.67 q/ha).

A total of 100 lines and three checks were screened for eight characters in Augmented Design at Ranchi. The entries in two characters had statistically significant variation. No entry was earliest in flowering and maturity. The maximum plant height (129.5 cm) was observed in LRB019 and LRB011 followed by LRB005 (125.5 cm). The genotypes LRB75-1, LRB67 (4.5) had the highest number of branches, while LRB67 (36) and LRB48 (26.5) had the highest number of pods per plant. The maximum number of seeds per pods was recorded in the genotype LRB07 followed by LRB01 and LRB92. The longest pod (10.0 cm) was observed in the genotypes LRB-1, LRB40-1, LRB117. The entry LRB55 had the bold seed (7.8 g) followed by LRB-75-1 (7.5 g).

A set of 100 accessions with three checks RBL-6, RBL-35 and RBL-50 were evaluated in Augmented Design for five characters at GAU, S.K. Nagar. Early flowering was observed in the genotypes LRB104, LRB-21-2 and LRB-93. The entries LRB-21-2 (113.00 days) and LRB-104 (116 days) were earliest in maturity. Maximum plant height (92.64 cm) was observed in the genotypes LRB-14 followed by LRB12 (92.1 cm). The entry LRB-104 (5.18) and LRB-16 (5.17) had the highest number of branches per plant. Maximum yield per plant (7.32 g)

was recorded in LRB-91 followed by LRB-12 (6.4 g). The entries showed statistically significant variations for in all characters.

The performance of a entry based on adjusted value, average over the locations has been given as below.

The mean flowering time was the earliest at Bangalore (44.5 days) followed by Bhubaneswar (46.4 days), while it was very late at S.K. Nagar (90.08 days). On the basis of average over seven locations no entry was superior to the check varieties in flowering.

Maturity period was the earliest at Bangalore (81.1 days) followed by Rahuri (91.5 days). There was a difference of about 50 days between Bangalore and Delhi. Based on the average over seven locations the entry LRB-111 (101.59 days) was the earliest in maturity.

Mean plant height was highest at Rahuri (133.8 cm) followed by Delhi (131.89 cm) and very low at Bangalore (46.7 cm). Based on the average over the locations the entry LRB-073-1 (109.93 cm) and LRB-071-1 (105.20 cm) had the maximum plant height.

The number of primary branches was highest at Delhi (4.6) followed by Rahuri (3.9). Based on the average over the locations the entry LRB-075-1 (3.91) had the highest number of branches.

The grain yield per plant recorded at four locations showed that Delhi centre had the highest coefficient of variation. The variation among the centres was relatively very high. Based on average over the four location the entry LRB-071-2 (31.22 g) and LRB-072-2 (29.26 g) had the highest grain yield per plant.

The number of pods per plant was highest at Delhi (67.1) followed by Rahuri (36.3) and very low at Bangalore (7.4). Based on data over the locations the entry LRB-074-2 (45.09) had the highest number of pods per plant followed by LRB-071-2 (44.71).

The number of seeds per plant recorded at three locations revealed that it was highest at Delhi (8.4) followed by Bhubaneswar (6.3).

The mean pod length was recorded in three locations. It was highest at Delhi (8.6 cm) followed by Bhubaneswar (8.5 cm). Based on the average over a locations the entry LRB-116 (9.79 cm) had the longest pod length.

100 seed weight was observed at five locations. It showed that highest seed weight was at Ludhiana (7.1 g) followed by Bhubaneswar (6.5 g). Based on average over locations, the entry LRB-115 (6.8 g) had the boldest seed.

The mean seed yield (q/ha) was recorded at four locations. It was highest at Delhi (13.5 q/ha) followed by Rahuri (9.9 q/ha). Based on average over locations the entry LRB-081 (20.5 q/ha) had the highest seed yield followed by LRB-028 (18.40 q/ha).

3.2.4 Faba bean (*Vicia faba*)

Germplasm screening nursery consisting of 50 accessions supplied by CCS HAU, Hisar was to be evaluated at two locations viz. Hisar and New Delhi. The results were received from both the locations. The checks used were PRT-12, PRT-7 and VH-82-1 and the list of promising genotypes of the two centres have been presented in table 110.

At CCS HAU, Hisar, a set of 190 including checks were evaluated for quantitative characters. The genotypes EC267639, EC329673 and IC331587 (57.00 days) were earlier in flowering, while EC323731 (163 days) and IC332138 were earlier in maturity. Maximum plant height (87.3 cm) was observed in the genotype EC354985 followed by EC117744 (85.2 cm). The entry EC329679 and EC10720 had the highest number of branches per plant, while EC10720 had the highest number of cluster per plant and pods per plant. The longest pod (6.5 cm) was recorded in EC329682 followed by EC3296730 (5.9 cm). The entries EC329708 (42.1 g) and EC117748 (39.1 g) had the highest 100 seed weight while the genotype HB-516 (104 g) had the highest seed yield per plant. The statistical parameters for all characters have been given in table 111.

A total of 196 genotypes including three checks were evaluated in Augmented Design at N.B.P.G.R., New Delhi for four qualitative and ten quantitative characters. Early flowering was observed (44.0 days) in the genotypes EC329681 and EC243770 (45.0 days) whereas early maturity was

observed (135.0 days) in the genotypes MKS/AKT 260 followed by EC117726 (137.0 days). Highest pods per plant (103.0) was observed in the genotype VKS14/17 and EC243808 (92.8). Maximum plant height (106.4 cm) was recorded in the genotype IC331887 followed by IC331561 (105.8 cm). The entries KS/TRS 1265 (10.0) and EC117755 (7.4) had the highest number of branches per plant, while entry MKS/AKT 2/3 had the highest number of grains per pod (4.4). The maximum seed yield (55.50 q/ha) was produced by the genotype IC361496 followed by EC243808 (51.06 q/ha). The boldest seed was recorded in the genotype IC493456 (88.90 g) followed by IC493459 (85.80 g). The means and ranges for various characters have been presented in table 112.

3.2.5 Winged bean

Germplasm screening nursery consisting of 25 accessions supplied N.B.P.G.R., Akola was planned to be evaluated at four locations viz., UAS Bangalore; MPKV, Rahuri; BAU, Rahuri and IGAU, Ambikapur. The data were received from three centres only. No checks were used by all the centres. The list of promising genotypes have been presented in table 113 and statistical parameters in table 114.

A set of 19 genotypes were evaluated at MPKV, Rahuri for eight characters. The entries IC452291-1, EC178288, E21904, EC142667 and EC27886-A-2 (56.00 days) were earliest in flowering and EC178287 (122.0 days) was earliest in maturity. Seed yield per plant (g) was highest in the genotype IC-95222, while seed yield (q/ha) was highest in EC142667 (16.10 q/ha) followed by IC-45229-1 (15.27 q/ha).

A total of 19 genotypes were also evaluated at IGKV, Ambikapur for nine characters. The entries IC95222 (77.00 days) and EC178288 (82.00 days) were earliest in flowering, while EC142662 was earliest in maturity. The maximum plant height was recorded in EC95248 (325.3 cm) followed by EC21904 (307.6 cm). The entry EC27886-42 had the highest number of branches per plant, while EC95248 had highest number of pods per plant. The longest pod was observed in EC21904 (18.1 cm). The highest yield per plant (76.7 g) was in the genotype IC95248. Higher seed yield (q/ha) was recorded in the genotype IC95248 (6.39 q/ha).

A set of 25 genotype were evaluated at BAU, Ranchi for six characters. Early flowering (66.0 days) and maturity (153.0 days) and highest number of pods per plant were recorded in the genotype IC95234. The maximum plant height (286.0 cm) was observed in the genotype EC178287, while it had also maximum number of seeds per pods. The longest pod (19.0 cm) was recorded in the genotypes IC45229-1 and EC114273-B.

A set of 30 entries including check were evaluated for eight yield attributes at UAS, Bangalore. The maximum plant height was recorded in NBRI-Sel (184.0 cm) followed by Dwarf mutant. The entry IC 095222 had the highest number of pods per plant (15.2) followed by EC 116889 (13.5). The longest pod length (14.5 cm) was observed in the genotype IC 027885-1 followed by Mysore Local. The NBRI-Sel had the highest seed yield per plant (23.0 g). The statistical parameters for various characters have been presented in table 115.

The result based on all locations excluding Bangalore have been discussed as below.

The flowering time was the earliest at Rahuri (57.3) and latest at Ambikapur (105.5). The same trend was observed in maturity. Based on the average over three locations, the entry IC095234 was earliest in flowering (66.00 days) and maturity (153.00 days).

The plant height of the entries was the highest at Ambikapur (270.7 cm) and lowest at Ranchi (210.30 cm). Based over 3 locations, the entry EC178266 (293.4 cm) had the tallest plant height followed by EC142667 (285.6 cm).

Number of pods per plant was highest at Rahuri (168.2) and lowest at Ambikapur (8.2). Based on three locations, the entry EC027886 (163.9) had the maximum number of pods per plant.

The length of pods was recorded at two centres. It was highest at Ranchi (15.5 cm) followed by Ambikapur (14.6 cm). Based over two locations, the entry EC114273-B (19.00 cm) had the highest pod length.

The seed yield per plant (g) recorded at two locations showed that it was highest at Rahuri (19.1 g) followed by Ambikapur (16.0 g). Based on the

average over two locations, the entry IC095248 (45.9 g) had the highest seed yield per plant. Similar trend was observed in seed yield (q/ha). Based on average over the two locations, the entry IC095248 (9.86 q/ha) had the highest yield.

3.2.6 Kalingada

Germplasm screening nursery consisting of 50 genotypes supplied by GAU, S.K. Nagar was to be evaluated at two locations viz. GAU, S.K. Nagar and RAU Mandor. The data were received from all the centres. The check used was GK-1. The list of promising entries have been presented in table 116.

At GAU, S.K. Nagar, a set of 50 genotypes were evaluated for eleven characters. Statistical parameters for all the characters have been presented in table 117. The test weight (g) was highest in the genotype SKNK-656 (0.4 g) followed by SKNK 651 (0.33 g). Large fruit size (48.19 cm) was recorded in the genotype SKNK-673, while the seed yield per fruit was highest in the genotype SKNK-667 (68.1 g).

A total of 37 genotypes were also evaluated at RAU, Mandor for six characters. The highest seed yield (q/ha) was recorded in genotype SKNK-112 (2.75 q/ha) followed by SKNK-129 (2.02 q/ha). The entry SKNK-129 had the highest number of fruit per plant (8.7) and fruit yield per plant (2.23 kg). The highest fruit weight (452.0 g) was observed in the genotype SKNK-138 followed by SKNK-136 (368.0 g). The entries SKNK-138 (35.5 cm) and SKNK-129 (33.00 cm) had the highest girth of fruit. The 100 seed weight (g) was recorded highest in the genotype SKNK 140 (8.3 g). The statistical parameters for all the characters have been presented in table 118.

3.2.7 Tumba

Germplasm consisting of 22 accessions was evaluated at RAU, Mandor centre only. No check was used for screening the accessions. The list of promising genotypes for all the characters have been presented in table 119 and statistical parameters in table 120.

The entry RMT 516 (7.56 q/ha) had the highest seed yield followed by RMT 515 (6.94 q/ha). The maximum number of fruit per plant was recorded in the genotypes RMT-516 (20.00) and RMT-502 (16.00). The entry RMT-516 (4.10 kg) had the highest fruit yield per plant. Maximum single fruit weight (g) was observed in the genotype RMT-515 (261.0 g) followed by RMT-524 (248.0 g). The biggest size of fruit was recorded in the genotype RMT-512 (29.70 g). The entries RMT-527 (4.30 g) and RMT-522 (4.30 g) had the maximum 100 seed weight (g).

3.2.8 Jatropha

Jatropha accessions consisting of 30 genotypes was planned to be evaluated at six locations. The data have been received from only two centres viz. S.K. Nagar and Hisar. The list of promising genotypes for various characters for various locations has been presented in table 121.

A set of 28 genotypes was evaluated at S.K. Nagar for three locations in randomized block design. The maximum plant height (151.00 cm) was recorded in the genotype CSMCRI-7. The entry Ranpur (8.17) had the highest number of branches followed by Kumbharia (8.05). The highest stem girth was observed in the genotypes CSMCRI-7 (Table 122).

A total of 11 genotypes were maintained at Hisar for four characters. Maximum height of plant (214.00 cm), number of branches per plant and stem girth were recorded in the genotype JH-2 (Table 123).

3.2.9 Simarouba

Simarouba genotypes were planned for maintaining the germplasm at six locations, but results were received from three centres. The list of promising genotypes for all the characters have been presented in table 124.

A set of 27 genotypes was maintained at Rahuri. The maximum plant height (2.66 m) was observed in the genotypes B-1 and M-8 followed by M-3 (2.64 m). The entries M-3 and M-4 had the highest number of branches per plant. The highest stem girth (33.0 cm) was recorded in the genotypes M-12. The entry M-11 (male) had the highest diameter of plant (180 cm) (Table 125).

At Bhubaneswar, 13 genotypes was maintained. The data were received for two characters. The maximum plant height (48.0 cm) was recorded in B-Simarouba 7 and stem girth in B-Simarouba 3, 4, 5, 6, 7, 10 (Table 126).

In paradise tree germplasm lines consisting of five entry was maintained at RAU, Mandor. The results have been represented in table 127. Seed yield of the entries ranged from 95.0-690 (g). The entry no. 1 yielded the highest.

Table 102. Promising lines in grain amaranths germplasm (Rabi 2004-05) for various characters at various locations (Plain).

S.No.	Characters	Range	Promising lines	Highest value of best check
New Delhi (Accessions 62)				
1.	Days to flowering	29.0-78.0	IC444171, IC444176, IC444148, IC444163, IC444146, IC444135, IC444149, IC444141, IC444147, IC444134, IC444136, IC444183, IC444152, IC444137, IC444144, IC444162, IC444164, IC444156 < (41.0 days)	Annapurna (49.6 days)
2.	Days to maturity	149.0-165.0	IC344699, IC398476, IC398490, IC394084, IC332334, IC398496, IC398646, IC417659, IC444162, IC444164, IC243176, IC444149, IC398471, IC398483, IC398474, IC394085 < (153.0 days)	Suvarna (152.8 days)
3.	Plant height (cm)	19.24-106.04	IC398495, IC398488, IC398485, IC427681, IC394084, IC444165, IC398494, IC394085, IC444173, IC427693, IC444151, IC398490, IC394083, IC398482, IC427637, IC398493, IC427617, IC398486, IC385773, IC398478, IC427619, IC344699, IC418477, IC444182, IC427647, IC398496 > (70.0 cm)	Suvarna (59.5 cm)
4.	No. of branches	3.40-13.67	IC398496, IC398471, IC444173, IC344699, IC398490, IC427681, IC418477, IC398499, IC398495, IC398493, IC427647, IC444165, IC427619 > (10.0)	Suvarna (7.7)
5.	Inflorescence length (cm)	9.80-79.30	IC444173, IC444165, IC444182, IC398478, IC427637, IC394084, IC394085, IC398495, IC427681, IC427617, IC427619, SKNA 13, IC332334, IC398490, IC398493 > (40.0 cm)	Annapurna (34.8 cm)
6.	No. of inflorescence	7.40-35.0	IC394083, IC398486, IC332334, IC398471, IC398499, IC398496, IC394112, IC398495, IC398490 > (25.0)	Suvarna (20.2)
7.	Seed yield (q/ha)	1.66-34.41	IC394084, IC398495, IC444165, IC427617, IC444182, IC398494, IC398478 > (22.00 q/ha)	Annapurna - (16.20 q/ha)
Hisar (Accessions 63)				
1.	Days to 50% flowering	60.0-97.0	IC35538, IC35567 < (65.0 days)	Suvarna (70.0 days)
2.	Days to maturity	191.0-218.0	IC35598, IC35505, IC35452, IC35661 < (194.0 days)	Annapurna (194.0 days)
3.	Plant height (cm)	22.3-122.2	IC35735, RMA7, IC35593, IC35608 > (110.0 cm)	GA-1 (89.75 cm)

S.No.	Characters	Range	Promising lines	Highest value of best check
4.	Branches per plant	3.0-11.6	IC21925, IC35399, Phoole GA20041, IC35626, IC35440 > (9.0)	BGA-3 (9.0)
5.	Panicle length (cm)	8.6-37.5	IC35370, IC35593, IC35626, IC21923, IC35602, IC35783, IC35654, IC35446, IC35501, IC35718 > (34.0 cm)	GA-2 (29.56 cm)
6.	Seed weight on volume basis (10 ml/gm)	6.3-8.9	PRA2004, RMA8, IC35446, Phoole GA20041, RMA7, IC35675, IC21806, IC35555 > (8.2 g)	RMA-3 (7.90 g)
7.	Single plant weight (g)	4.6-31.8	RMA8, PRA2004, IC21923, RMA7, IC35399, Phoole GA20041, IC35440, IC35370, IC35626, IC35675, IC35783, IC21940, IC35501 > (26.0 g)	GA-2 (22.76 g)
S.K. Nagar (Accessions 50)				
1.	Days to 50% flowering	46.0-60.0	No Accessions	GA-2 (46.0 days)
2.	Plant height (cm)	78.0-182.0	RYM-26, RYM-23, RYM-20, RYM-19, RYM-21 > (166.0 cm)	GA-1 (158.0 cm)
3.	Inflorescence length (cm)	55.8-103.7	RYM-31 > (101.0 cm)	GA-1 (101.5 cm)

Table 103. Evaluation of germplasm lines in grain amaranth at Delhi – Plains (2005)

S. No.	Accession No.	Alternate identity	Qualitative Characters			Quantitative characters						
			Leaf colour	Inflorescence colour	Seed colour	Days to flowering	Days to maturity	Plant height (cm)	No. of branches	Inflorescence length (cm)	No. of inflorescence	Seed yield (q/ha)
1	IC444134	RSR/AKS-2	1	2	1	34.0	156.0	28.7	5.0	19.4	16.4	14.43
2	IC444135	RSR/AKS-3	2	2	1	31.0	160.0	21.2	5.4	18.2	22.0	16.65
3	IC444136	RSR/AKS-4	1	2	1	34.0	160.0	34.0	5.4	22.9	15.4	12.21
4	IC444137	RSR/AKS-5	4	2	1	36.0	163.0	19.2	4.6	22.5	11.8	5.55
5	IC444141	RSR/AKS-9	5	2	11	34.0	156.0	27.0	5.4	18.2	14.2	5.55
6	IC444144	RSR/AKS-12	6	1	1	36.0	159.0	19.6	4.6	21.7	13.6	11.10
7	IC444146	RSR/AKS-14	7	2	1	31.0	163.0	66.2	5.2	23.6	15.2	19.98
8	IC444147	RSR/AKS-15	2	5	1	34.0	160.0	43.6	4.6	25.2	17.4	15.54
9	IC444148	RSR/AKS-16	2	4	1	29.0	165.0	45.8	4.6	33.0	19.8	11.10
10	IC444149	RSR/AKS-17	5	1	1	31.0	152.0	48.8	5.0	32.0	19.2	6.66
11	IC444151	RSR/AKS-20	1	2	2	54.0	154.0	83.4	8.2	39.0	18.4	11.10
12	IC444152	RSR/AKS-21	3	3	1	36.0	156.0	46.8	5.6	32.2	22.4	12.21
13	IC444156	RSR/AKS-24	5	2	2	40.0	156.0	38.8	5.2	33.7	22.8	13.32
14	IC444162	RSR/AKS-30	1	1	1	36.0	151.0	43.6	5.2	26.6	18.2	14.43
15	IC444163	RSR/AKS-31	2	2	1	29.0	153.0	34.8	4.6	20.1	14.6	11.10
16	IC444164	RSR/AKS-33	1	5	1	39.0	151.0	42.0	4.8	30.9	19.6	9.99
17	IC444165	RSR/AKS-34	5	2	1	47.0	153.0	88.6	10.0	71.6	19.6	29.97
18	IC444171	RSR/AKS-39	2	3	2	29.0	155.0	58.0	4.8	36.3	17.0	8.88
19	IC444173	RSR/AKS-41	1	6	1	63.0	161.0	85.8	12.6	79.3	16.6	19.98
20	IC444176	RSR/AKS-44	2	2	2	29.0	158.0	53.8	4.8	34.7	19.0	6.66
21	IC444182	RSR/AKS-50	5	1	1	52.0	156.0	71.0	9.2	54.4	18.0	28.86
22	IC444183	RSR/AKS-51	4	2	2	36.0	153.0	36.6	3.4	28.4	7.4	7.77

S. No.	Accession No.	Alternate identity	Qualitative Characters			Quantitative characters						
			Leaf colour	Inflorescence colour	Seed colour	Days to flowering	Days to maturity	Plant height (cm)	No. of branches	Inflorescence length (cm)	No. of inflorescence	Seed yield (q/ha)
23	IC444192	RSR/AKS-60	5	2	1	45.0	155.0	39.0	5.0	23.5	21.0	4.44
24	IC444190	RSR/AKS-58	2	1	2	41.0	154.0	31.7	3.7	21.7	8.0	1.67
25	IC394112	RYM 34	5	2	1	59.0	161.0	56.0	7.0	35.0	27.0	3.33
26	-	SKNA 13	5	1	2	63.0	153.0	67.6	5.0	43.3	15.8	11.10
27	IC 243176		5	2	1	44.0	151.0	45.2	4.2	28.4	9.6	7.77
28	IC398483	KG 23/73	5	1	2	54.0	152.0	57.6	5.4	33.3	17.6	9.99
29	IC427617	SDC 2/21	5	2	1	54.0	159.0	77.9	5.4	46.8	19.2	28.86
30	IC427619	SBC 2/23	5	1	2	47.0	157.0	75.4	10.0	44.9	18.8	7.77
31	IC427637	SBC 2/41	2	2	1	51.0	154.0	80.2	8.4	49.5	18.2	9.99
32	IC427647	SBC 2/51	4	1	2	51.0	153.0	70.4	10.2	39.9	18.6	18.87
33	IC427681	SBC 2/85	2	1	1	51.0	163.0	94.4	10.4	47.0	18.0	11.10
34	IC427693	SBC 2/97	8	1	2	47.0	165.0	83.5	9.2	40.3	16.0	7.77
35	IC427705	SBC 2/109	2	1	1	63.0	153.0	34.2	3.6	9.8	12.2	8.33
36	IC418477	MTS 62	1	1	2	54.0	158.0	71.3	10.4	19.0	17.0	8.88
37	IC395827	MD 113	2	1	2	58.0	153.0	55.1	4.8	29.7	14.6	11.10
38	IC396769	NKSC 59	5	2	2	56.0	154.0	47.3	4.6	29.0	11.0	6.66
39	IC417659	JBT 36/40	6	1	2	78.0	150.0	53.8	6.4	24.7	11.0	4.44
40	IC332334	53/UR/165	4	2	1	54.0	150.0	64.7	7.3	43.1	31.7	8.88
41	IC344699	MKSP 103	2	1	1	49.0	149.0	73.0	12.4	37.8	20.8	17.76
42	IC398493	KG 3/133	5	2	2	54.0	153.0	79.0	10.2	41.1	21.6	12.21
43	IC385773	JBT 34/57	1	3	1	63.0	155.0	75.8	9.8	36.9	17.8	16.65
44	IC398646	AKP 12/91	2	3	1	63.0	150.0	68.9	4.8	40.1	15.5	8.88
45	IC394081	RYM 3	5	3	2	47.0	154.0	69.5	9.6	32.2	21.2	12.21

S. No.	Accession No.	Alternate identity	Qualitative Characters			Quantitative characters						
			Leaf colour	Inflorescence colour	Seed colour	Days to flowering	Days to maturity	Plant height (cm)	No. of branches	Inflorescence length (cm)	No. of inflorescence	Seed yield (q/ha)
46	IC394083	RYM 5	4	2	1	78.0	156.0	81.0	9.0	38.0	35.0	5.55
47	IC394084	RYM 6	2	3	2	54.0	150.0	91.9	7.2	49.3	21.8	34.41
48	IC394085	RYM 7	2	3	2	63.0	152.0	88.0	6.0	48.5	19.0	4.44
49	IC398471	KG 3/13	2	3	2	54.0	152.0	65.0	13.0	25.5	29.5	3.33
50	IC398470	KG 3/5	3	1	1	63.0	156.0	49.5	5.5	28.4	16.5	4.44
51	IC398499	KG 3/166	3	1	2	45.0	159.0	69.8	10.4	37.3	28.4	14.43
52	IC398496	KG 3/142	3	2	1	54.0	150.0	70.2	13.7	23.2	27.3	4.44
53	IC398495	KG 3/139	3	1	1	51.0	154.0	106.0	10.2	48.4	26.8	32.19
54	IC398494	KG 3/136	3	2	1	54.0	156.0	88.2	8.4	37.8	22.2	23.31
55	IC398490	KG 3/118	3	1	1	63.0	149.0	82.8	11.2	42.1	25.4	7.77
56	IC398486	KG 3/90	3	2	1	42.0	153.0	77.3	9.5	33.4	33.0	4.44
57	IC398488	KG 3/100	3	1	2	42.0	155.0	99.4	7.4	40.8	19.8	4.44
58	IC398485	KG 3/81	5	2	1	54.0	153.0	94.8	9.0	39.6	22.6	6.66
59	IC398482	KG 3/69	2	1	2	54.0	155.0	80.3	8.2	40.1	18.0	12.21
60	IC398478	KG 3/51	5	2	1	47.0	157.0	75.7	6.0	49.8	14.0	22.20
61	IC398476	KG 3/39	2	1	2	54.0	149.0	59.7	6.8	35.5	21.2	8.88
62	IC398474	KG 3/28	6	2	1	54.0	152.0	52.7	3.6	37.4	13.2	5.55
Means for check varieties												
		Annapurna	2	3	1	49.6	153.8	51.7	5.7	34.8	18.9	16.21
		Suvarna	2	3	1	62.6	152.8	59.5	7.7	30.6	20.2	12.54
		Minimum				29.00	149.00	19.24	3.40	9.80	7.40	1.67
		Maximum				78.00	165.00	106.04	13.67	79.30	35.00	34.41
		Mean				48.50	155.03	61.76	7.10	35.02	18.96	11.86
		CV (%) Phenotypic				24.31	2.57	34.60	37.55	34.32	29.38	62.30

Quantitative characters:- Leaf colour: 1-Yellow, 2-Yellowish orange, 3-Yellowish green, 4-Orange, 5-Green, 6-Greenish orange, 7-Pink, 8-Pinkish green, 9-Reddish yellow, 10-Reddish green, 11-Red, 12-Dark red; Inflorescence colour: 1-Light yellow, 2-Yellow, 3-Yellowish orange, 4-Yellowish green, 5-Orange, 6-Pink, 7-Pinkish green, 8-Purple, 9-Red, 10-Reddish green, 11-Green; Seed colour: 1-White, 2-Creamish, 3-Pale yellow, 4-Pink, 5-Red, 6-Brown, 7-Black, 8-Golden.

Table 104. Evaluation of germplasm lines in grain amaranth at Hisar – Plains (2005)

S. No.	Accession No.	Days to 50% flowering	Days to maturity	Plant height (cm)	Branches / plant	Panicle length	Seed weight on volume basis(10 ml/ g)	Seed weight/ plant (g)
1	BGA-2	69.0	195.0	60.0	8.0	25.0	6.8	20.5
2	BGA-3	76.1	198.2	85.5	8.6	25.8	7.1	20.7
3	IC21806	79.0	203.0	68.3	7.3	27.6	8.3	10.7
4	IC21923	71.0	200.0	62.0	9.0	36.0	8.2	29.9
5	IC21925	71.0	196.0	54.6	11.6	25.3	6.7	15.8
6	IC21940	65.0	200.0	60.0	8.6	34.0	6.8	26.1
7	IC21940	69.0	201.0	62.3	9.0	32.6	7.0	21.2
8	IC268667	91.0	208.0	101.6	4.6	20.3	7.0	15.2
9	IC35370	90.0	210.0	110.0	6.0	37.5	7.0	27.5
10	IC35391	71.0	195.0	66.6	6.0	17.6	7.9	9.8
11	IC35399	71.0	203.0	78.6	10.0	34.0	7.2	29.5
12	IC35414	91.0	205.0	64.0	7.3	25.3	8.1	22.9
13	IC35438	70.0	196.0	62.0	8.0	18.5	8.0	10.5
14	IC35440	72.0	203.0	61.6	10.0	31.6	6.9	28.2
15	IC35446	81.0	205.0	58.0	8.0	34.3	8.4	24.4
16	IC35452	71.0	193.0	56.6	6.0	18.3	8.0	12.9
17	IC35494	73.0	195.0	55.0	6.0	13.5	6.5	7.4
18	IC35501	97.0	205.0	58.0	8.0	34.3	6.6	26.1
19	IC35505	68.0	193.0	40.0	5.0	19.6	7.5	16.9
20	IC35536	75.0	195.0	71.6	6.6	28.0	8.2	16.9
21	IC35538	60.0	201.0	43.5	6.5	23.5	6.9	19.2
22	IC35546	65.0	195.0	61.0	7.0	19.6	6.9	9.9
23	IC35553	68.0	198.0	66.6	8.3	24.6	8.2	19.3
24	IC35555	79.0	201.0	56.6	5.6	13.3	8.3	8.1
25	IC35567	62.0	198.0	67.0	9.0	20.0	7.6	10.8
26	IC35580	71.0	195.0	81.3	8.3	26.6	7.6	19.6
27	IC35589	71.0	195.0	54.3	8.3	20.3	7.8	14.8

S. No.	Accession No.	Days to 50% flowering	Days to maturity	Plant height (cm)	Branches / plant	Panicle length	Seed weight on volume basis(10 ml/ g)	Seed weight/ plant (g)
28	IC35593	73.0	205.0	111.0	4.5	37.0	8.2	23.3
29	IC35596	95.0	218.0	110.0	6.0	26.0	6.8	19.8
30	IC35597	68.0	195.0	37.5	5.5	28.0	7.3	21.4
31	IC35598	70.0	191.0	75.0	8.5	16.5	7.2	10.6
32	IC35602	70.0	196.0	70.0	6.5	35.5	6.3	25.6
33	IC35608	89.0	209.0	110.5	8.0	23.0	7.3	13.8
34	IC35626	93.0	203.0	64.3	10.0	36.6	7.3	27.3
35	IC35647	68.0	195.0	54.6	8.3	22.6	7.1	18.4
36	IC35654	68.0	198.0	67.5	8.0	34.5	7.3	25.4
37	IC35661	70.0	193.0	57.5	4.0	17.0	6.5	9.9
38	IC35673	71.0	195.0	78.5	8.5	25.5	6.7	20.1
39	IC35675	69.0	196.0	36.6	5.3	28.6	8.3	26.8
40	IC35677	83.0	208.0	100.6	5.0	31.6	7.1	21.5
41	IC35694	83.0	200.0	66.0	5.3	19.6	8.0	8.3
42	IC35701	71.0	196.0	75.0	9.3	16.6	6.7	8.0
43	IC35706	66.0	196.0	50.0	7.0	12.0	6.3	6.9
44	IC35709	70.0	194.0	67.5	4.5	32.5	7.1	25.3
45	IC35718	93.0	205.0	83.6	7.0	34.3	6.3	23.1
46	IC35735	85.0	205.0	122.2	4.6	32.3	6.8	23.6
47	IC35757	71.0	200.0	68.0	8.6	34.0	8.2	25.2
48	IC35777	65.0	196.0	80.0	7.0	29.0	7.0	20.5
49	IC35780	71.0	196.0	56.0	8.0	19.6	7.6	6.9
50	IC35783	71.0	195.0	70.0	6.6	34.6	6.9	26.4
51	IC35783	73.0	198.0	37.6	5.6	17.0	7.2	20.2
52	IC41989	67.0	196.0	32.0	4.6	19.0	6.6	11.6
53	IC42002	67.0	195.0	28.6	4.3	8.6	7.2	5.2
54	IC42015	69.0	201.0	49.6	5.3	16.6	6.3	9.1
55	IC42258	67.0	195.0	22.3	3.0	9.3	6.5	4.6

S. No.	Accession No.	Days to 50% flowering	Days to maturity	Plant height (cm)	Branches / plant	Panicle length	Seed weight on volume basis(10 ml/ g)	Seed weight/ plant (g)
56	IC93962	67.0	194.0	55.0	4.3	29.3	6.6	23.6
57	Phoole GA-2004-1	91.0	203.0	78.6	10.0	34.0	8.4	28.2
58	PLP-1	90.0	195.0	35.6	6.3	27.3	6.8	17.9
59	PRA-2004	69.0	201.0	70.0	6.3	26.0	8.9	30.8
60	RGAS-92-10	79.0	195.0	59.0	6.0	25.6	7.2	16.5
61	RMA-3	83.1	201.9	87.7	6.6	28.5	7.9	21.3
62	RMA-7	88.0	209.0	115.6	4.6	28.6	8.4	29.8
63	RMA-8	90.0	208.0	110.0	7.6	32.3	8.5	31.8
Means for Check varieties								
	Annapurna	70.3	193.8	66.4	6.7	22.4	7.2	15.5
	GA-1	77.5	203.8	89.8	6.8	28.8	7.4	17.6
	GA-2	88.4	205.8	89.7	6.1	29.6	7.6	22.8
	Suvarna	70.3	198.5	67.2	6.8	27.7	7.5	18.2
	Minimum	60.0	93.0	22.3	3.0	8.6	6.3	4.6
	Maximum	97.0	218.0	122.2	11.6	37.5	8.9	31.8
	Mean	75.2	197.9	68.3	6.9	25.7	7.3	18.8
	SD	9.3	14.0	22.0	1.8	7.3	0.7	7.3
	CV % phenotypic	12.4	7.1	32.2	25.6	28.4	9.0	38.8

Table 105. Evaluation of germplasm lines in grain amaranth at S.K. Nagar – Plains (2005)

S. No.	Accession No.	Quantitative characters				Qualitative characters							
		Days to 50% flowering	Plant height	Inflorescence length	Yield / Plant	Inflorescence Spinescence	Growth habit	Leaf colour	Inflorescence Colour	Inflorescence Compactness	Stem Colour	Inflorescence shape	Stem surface
1	RYM-1	58.0	162.0	79.8	14.0	4	1	5	11	5	2	4	1
2	RYM-2	60.0	159.0	73.0	9.0	4	1	5	11	5	2	4	1
3	RYM-3	60.0	164.0	75.6	11.0	4	1	6	7	5	8	4	1
4	RYM-5	51.0	153.0	84.4	25.0	3	1	5	11	5	2	4	1
5	RYM-6	48.0	145.0	77.2	17.0	4	1	5	11	5	2	4	1
6	RYM-7	48.0	152.0	91.4	17.0	4	1	6	6	5	4	4	1
7	RYM-8	49.0	160.0	94.2	25.0	4	1	8	11	5	2	4	1
8	RYM-10	49.0	140.0	86.8	17.0	4	1	5	11	5	2	4	1
9	RYM-12	47.0	145.0	90.8	24.0	4	1	5	11	5	2	4	1
10	RYM-13	47.0	155.0	78.2	7.0	4	1	5	11	5	2	4	1
11	RYM-14	46.0	163.0	74.6	21.0	4	1	5	11	5	2	4	1
12	RYM-15	49.0	145.0	82.0	25.0	4	1	5	11	5	2	4	1
13	RYM-16	49.0	151.0	80.6	21.0	4	1	5	11	5	2	4	1
14	RYM-17	50.0	155.0	89.6	25.0	4	1	5	11	5	2	4	1
15	RYM-18	49.0	151.0	86.2	13.0	4	1	5	11	5	2	4	1
16	RYM-19	50.0	170.0	93.4	9.0	4	2	5	11	5	2	4	1
17	RYM-20	50.0	177.0	98.0	6.0	4	1	8	6	5	6	4	1
18	RYM-21	47.0	167.0	92.6	9.0	4	1	6	6	5	4	4	1
19	RYM-22	47.0	124.0	73.6	11.0	3	1	6	6	5	4	4	1
20	RYM-23	50.0	178.0	98.0	13.0	4	1	5	11	5	2	4	1
21	RYM-25	49.0	166.0	84.2	27.0	4	1	5	11	3	2	2	1
22	RYM-26	50.0	182.0	87.4	21.0	4	1	8	6	5	6	4	1
23	RYM-27	50.0	162.0	83.4	21.0	4	1	5	11	5	2	4	1
24	RYM-28	47.0	158.0	90.2	23.0	4	1	5	11	5	2	2	1
25	RYM-30	50.0	107.0	86.6	23.0	4	1	5	11	5	2	4	1
26	RYM-31	53.0	139.0	103.7	5.0	4	2	5	6	5	9	4	1
27	RYM-32	55.0	125.0	96.7	9.0	4	2	5	5	7	2	4	1
28	RYM-33	46.0	102.0	70.2	11.0	4	2	8	6	5	6	4	1

S. No.	Accession No.	Quantitative characters				Qualitative characters							
		Days to 50% flowering	Plant height	Inflorescence length	Yield / Plant	Inflorescence Spineness	Growth habit	Leaf colour	Inflorescence Colour	Inflorescence Compactness	Stem Colour	Inflorescence shape	Stem surface
29	RYM-34	54.0	110.0	69.2	7.0	4	1	8	6	3	6	4	1
30	RYM-35	49.0	114.0	81.4	25.0	4	2	5	11	5	2	2	1
31	RYM-36	50.0	140.0	82.8	13.0	4	1	5	11	5	2	4	1
32	RYM-37	50.0	78.0	55.8	11.0	3	1	8	6	3	6	4	1
33	RYM-4	53.0	166.0	86.2	5.0	4	1	6	6	5	6	4	1
34	RYM-9	49.0	106.0	77.4	8.0	4	1	5	11	3	2	4	1
35	RYM-11	49.0	118.0	79.2	5.0	3	1	8	6	5	6	4	1
36	RYM-13	50.0	89.0	67.2	7.0	4	1	5	11	5	2	4	1
37	RYM-24	48.0	122.0	71.4	13.0	4	1	6	6	5	6	4	1
38	RYM-29	49.0	116.0	69.8	4.0	4	1	5	11	5	2	4	1
Means for Check varieties													
	GA-1	55.0	158.0	101.5	87.0	4	1	5	11	5	9	4	1
	GA-2	46.0	141.0	76.5	88.0	4	1	7	6	5	4	4	1
	Minimum	46.0	78.0	55.8	4.0	3	1	5	5	3	2	2	1
	Maximum	60.0	182.0	103.7	88.0	4	2	8	11	7	9	4	1
	Mean	50.2	142.9	83.0	18.3								
	SD	3.4	25.5	10.3	17.6								
	CV % phenotypic	6.9	17.9	12.4	96.1								

Qualitative Descriptor: Inflorescence Spineness: 3-Prickly, 4-Spiny; Growth Habit: 1- Erect, 2-Spreading; Leaf Colour: 5-Green, 6-Greenish orange, 8-Pinkish green; Inflorescence Colour: 5- Orange, 6-Pink, 7-Dark pink, 11-Green; Inflorescence Compactness: 3-Lax, 5-Intermediate, 7-Dense; Stem Colour: 2-Yellowish green, 4-Pink, 8-Yellowish green with red streak, 9- Yellowish green pink streak; Inflorescence shape: 2- Semi drooping, 4-Strait; Stem surface: 1-Smooth.

Table 106. Promising lines in grain amaranths germplasm (kharif, 2005) for various characters at various locations (Plain).

S.No.	Characters	Range	Promising lines	Highest value of best check
Rahuri (Accessions 50)				
1.	Days to 50% flowering	32.0-56.0	IC423400, IC415317, IC423548, IC415268, IC423544, EC519549, IC415282, IC423408, IC415271, IC423410, IC425466, IC415252, IC415314, IC415316, IC415462, IC421885, IC415220, IC415226, IC415250, IC415254, IC415258, IC415264, IC415448, IC415387 < (40.0 days)	Annapurna (48.0 days)
2.	Plant height (cm)	70.1-192.8	EC519554, EC524457, EC519549, EC519531, EC519543 > (162.0 cm)	GA-2 (162.0 cm)
3.	Inflorescence length (cm)	18.0-60.0	EC519549, EC519531, EC519543, IC415282, IC423548, IC415264, EC524457, IC415220, IC423400, IC423408, IC423544, IC415314, EC519532 > (44.0 cm)	GA-1 (40.0 cm)
4.	Inflorescence girth (cm)	6.0-28.0	EC519543, EC519531, EC519554, IC415282, IC415220, EC519549, EC519517, EC519526, IC415284, EC519522 > (22.0 cm)	GA-2 (18.4 cm)
5.	Weight / 10 ml volume	7.5-75.0	IC415220 > (74.0 g)	Annapurna (7.58 g)
6.	Yield (q/ha)	3.70-37.04	IC415331, EC519558, EC524457, EC519543, IC415282, EC519532, IC415220, EC519517, EC519526, EC519549, EC519542, IC415272, IC415271, IC415453, EC519522, EC519554, EC519512, IC415284, EC519531, IC415224, IC415462, IC415320, IC415316, IC415290, IC415243, IC415387, IC415252, EC519548, IC423398, IC4152266, IC415250, IC415258, EC519527, IC415236 > (6.60 q/ha)	Annapurna (5.25 q/ha)
Bangalore (Accessions 50)				
1.	Plant height (cm)	36.0-152.0	EC19554, EC519522 > (147.0 cm)	GA-1 (147.0 cm)
2.	Panicle length (cm)	22.0-53.0	IC415448, EC519558 > (50.0 cm)	GA-1 (47.0 cm)
3.	Days to flowering	29.0-51.0	IC415318, IC423410, IC415282, IC415316, IC415268, IC423548, IC415297, IC415314 < (31.0 days)	Annapurna (35.0 days)
4.	Days to maturity	60.0-92.0	IC423410, IC423548, IC415293, IC415252, IC415331, IC415224, IC415268, IC415317, IC415272, EC519512, IC415284, IC423398 < (65.0 days)	Annapurna (71.0 days)

S.No.	Characters	Range	Promising lines	Highest value of best check
Mettupalayam (Accessions 50)				
1.	Plant height (cm)	70.1-192.8	EC519558, EC519554, EC519517, EC519522, EC519542 > (164.0 cm)	GA-2 (148.0 cm)
2.	Panicle length (cm)	34.6-76.0	EC519558, EC519542, EC415448, EC519554 > (55.0 cm)	GA-2 (52.6 cm)
3.	Days to 50% flowering	30.0-46.0	IC415297, IC415317, IC415243, IC423410, IC415290, IC415314, IC415274, IC415320, IC415254, IC415236, IC415272 < (32.0 days)	Annapurna (37.0 days)
4.	Days to maturity	62.0-105.0	IC415297, IC415317, IC423410, IC415290, IC415314, IC415320, IC415254, IC415236, IC415272, IC415316, IC415220, IC423548, IC415284, IC415252, IC415266, IC415271, IC415282, IC415258 < (63.0 days)	Suvarna (79.0 days)
5.	Grain yield/plant (g)	4.0-20.0	IC415236 > (18.0 g)	Suvarna (18.0 g)
Best over all locations kharif 2005				
1.	Days to 50% flowering	31.7-50.7	IC423410, IC423548, IC415317, IC415282, IC415268, IC415314 < (33.0 days)	Annapurna (40.0 days)
2.	Days to maturity	71.0-100.7	IC423410, IC415268, IC415252, IC415224, IC423548, IC421885 < (73.0 days)	Suvarna (79.0 days)
3.	Plant height (cm)	63.9-165.5	EC519554, EC519522, EC519531, EC519558, EC519557, EC519526 > (144.0 cm)	Suvarna (133.4 cm)
4.	Panicle length (cm)	30.9-53.0	EC519558, EC519531 > (48.0 cm)	Suvarna (44.8 cm)

Table 107: Multilocation evaluation of germplasm lines in grain amaranth at Rahuri, Bangalore and Mettupalayam – Plains (2005)

S. No.	Accession No.	Days to flowering				Days to maturity				Plant height (cm)				Panicle length (cm)				Grain yield/plant (g)		
		Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean
1	EC519512	53.0	35.0	36.0	41.3	104.0	63.0	79.0	82.0	143.0	58.0	119.0	106.7	44.0	37.0	50.6	43.9	0.8	10.4	5.6
2	EC519517	51.0	46.0	43.0	46.7	94.0	90.0	79.0	87.7	118.0	117.0	166.6	133.9	42.0	36.0	52.8	43.6	1.3	12.0	6.6
3	EC519522	54.0	47.0	45.0	48.7	91.0	90.0	79.0	86.7	148.0	149.0	165.8	154.3	40.0	41.0	47.4	42.8	4.0	8.4	6.2
4	EC519526	53.0	46.0	45.0	48.0	90.0	90.0	79.0	86.3	149.0	130.0	153.4	144.1	41.0	39.0	52.0	44.0	2.1	8.6	5.4
5	EC519527	44.0	35.0	35.0	38.0	89.0	65.0	89.0	81.0	124.0	56.0	108.8	96.3	38.0	29.0	40.6	35.9	1.4	16.4	8.9
6	EC519531	48.0	46.0	45.0	46.3	102.0	90.0	79.0	90.3	166.0	129.0	158.6	151.2	57.0	42.0	48.0	49.0	3.7	10.2	6.9
7	EC519532	53.0	47.0	38.0	46.0	98.0	90.0	79.0	89.0	145.0	77.0	138.6	120.2	45.0	38.0	39.8	40.9	0.7	10.0	5.4
8	EC519542	40.0	46.0	37.0	41.0	96.0	84.0	89.0	89.7	150.0	96.0	164.2	136.7	40.0	38.0	57.8	45.3	1.8	18.0	9.9
9	EC519543	47.0	46.0	46.0	46.3	100.0	88.0	89.0	92.3	163.0	79.0	141.2	127.7	54.0	27.0	41.8	40.9	1.2	10.0	5.6
10	EC519548	41.0	33.0	33.0	35.7	97.0	75.0	79.0	83.7	107.0	81.0	117.0	101.7	38.0	37.0	51.4	42.1	2.2	8.2	5.2
11	EC519549	35.0	35.0	34.0	34.7	90.0	75.0	79.0	81.3	168.0	80.0	93.4	113.8	60.0	40.0	38.2	46.1	1.7	8.6	5.1
12	EC519554	53.0	46.0	45.0	48.0	97.0	90.0	89.0	92.0	169.0	152.0	175.4	165.5	40.0	47.0	56.0	47.7	3.2	16.4	9.8
13	EC519557	52.0	35.0	44.0	43.7	104.0	83.0	79.0	88.7	169.0	118.0	148.6	145.2	48.0	42.0	52.0	47.3	1.5	8.6	5.1
14	EC519558	54.0	40.0	45.0	46.3	104.0	90.0	105.0	99.7	147.0	100.0	192.8	146.6	32.0	51.0	76.0	53.0	3.6	10.2	6.9
15	IC415220	38.0	35.0	32.0	35.0	93.0	67.0	62.0	74.0	146.0	47.0	94.2	95.7	48.0	28.0	41.8	39.3	1.4	17.2	9.3
16	IC415224	41.0	35.0	33.0	36.3	93.0	61.0	62.0	72.0	112.0	58.0	97.4	89.1	35.0	32.0	38.8	35.3	1.7	17.4	9.6
17	IC415236	42.0	34.0	31.0	35.7	95.0	66.0	62.0	74.3	98.0	64.0	94.8	85.6	27.0	38.0	40.6	35.2	1.7	20.0	10.9
18	IC415243	41.0	35.0	30.0	35.3	97.0	60.0	79.0	78.7	107.0	54.0	98.8	86.6	30.0	29.0	45.8	34.9	1.2	8.4	4.8

S. No.	Accession No.	Days to flowering				Days to maturity				Plant height (cm)				Panicle length (cm)				Grain yield/plant (g)		
		Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean
19	IC415250	38.0	33.0	35.0	35.3	93.0	65.0	62.0	73.3	89.0	53.0	98.6	80.2	19.0	30.0	46.0	31.7	1.1	12.0	6.6
20	IC415252	37.0	35.0	32.0	34.7	94.0	60.0	62.0	72.0	75.0	36.0	88.2	66.4	44.0	22.0	40.6	35.5	1.1	8.0	4.6
21	IC415254	38.0	35.0	31.0	34.7	95.0	65.0	62.0	74.0	74.0	46.0	90.0	70.0	42.0	27.0	41.4	36.8	0.5	11.2	5.9
22	IC415258	38.0	31.0	32.0	33.7	95.0	65.0	62.0	74.0	66.0	49.0	76.6	63.9	44.0	27.0	35.0	35.3	0.4	14.4	7.4
23	IC415264	38.0	35.0	33.0	35.3	94.0	67.0	62.0	74.3	65.0	48.0	81.2	64.7	49.0	26.0	35.8	36.9	0.7	11.2	5.9
24	IC415266	38.0	35.0	32.0	35.0	95.0	65.0	62.0	74.0	63.0	52.0	105.6	73.5	43.0	27.0	40.4	36.8	0.9	12.0	6.5
25	IC415268	34.0	30.0	34.0	32.7	89.0	63.0	62.0	71.3	115.0	66.0	94.6	91.9	36.0	37.0	35.8	36.3	1.2	10.4	5.8
26	IC415271	36.0	33.0	32.0	33.7	97.0	66.0	62.0	75.0	102.0	66.0	95.6	87.9	29.0	39.0	38.6	35.5	1.5	9.2	5.4
27	IC415272	41.0	33.0	31.0	35.0	97.0	63.0	62.0	74.0	115.0	56.0	84.0	85.0	36.0	35.0	34.6	35.2	0.4	9.4	4.9
28	IC415274	42.0	34.0	31.0	35.7	94.0	68.0	79.0	80.3	96.0	58.0	102.4	85.5	19.0	32.0	46.0	32.3	1.1	10.4	5.8
29	IC415282	35.0	30.0	32.0	32.3	99.0	65.0	62.0	75.3	145.0	68.0	82.0	98.3	51.0	40.0	38.0	43.0	1.7	10.8	6.3
30	IC415284	41.0	35.0	32.0	36.0	97.0	63.0	62.0	74.0	147.0	49.0	97.2	97.7	37.0	29.0	40.8	35.6	0.8	12.6	6.7
31	IC415290	41.0	35.0	31.0	35.7	96.0	66.0	62.0	74.7	116.0	46.0	114.0	92.0	36.0	25.0	51.0	37.3	0.2	16.2	8.2
32	IC415297	40.0	30.0	30.0	33.3	98.0	67.0	62.0	75.7	155.0	65.0	105.2	108.4	39.0	33.0	51.4	41.1	1.3	8.6	4.9
33	IC415314	37.0	30.0	31.0	32.7	94.0	65.0	62.0	73.7	118.0	55.0	99.4	90.8	46.0	27.0	47.2	40.1	1.1	10.6	5.9
34	IC415316	37.0	30.0	32.0	33.0	98.0	65.0	62.0	75.0	106.0	68.0	109.4	94.5	38.0	39.0	50.4	42.5	1.1	8.4	4.8
35	IC415317	33.0	33.0	30.0	32.0	95.0	63.0	62.0	73.3	121.0	66.0	104.4	97.1	44.0	35.0	48.4	42.5	1.3	10.2	5.8
36	IC415318	42.0	29.0	33.0	34.7	95.0	65.0	62.0	74.0	67.0	72.0	96.4	78.5	20.0	35.0	49.6	34.9	1.4	6.8	4.1
37	IC415320	41.0	31.0	31.0	34.3	97.0	65.0	62.0	74.7	110.0	63.0	98.4	90.5	41.0	39.0	42.4	40.8	1.7	9.0	5.3
38	IC415331	40.0	32.0	35.0	35.7	96.0	61.0	62.0	73.0	116.0	52.0	91.0	86.3	27.0	33.0	47.6	35.9	1.1	6.0	3.5
39	IC415387	39.0	34.0	36.0	36.3	97.0	65.0	79.0	80.3	122.0	65.0	100.6	95.9	27.0	34.0	44.6	35.2	2.0	9.2	5.6

S. No.	Accession No.	Days to flowering				Days to maturity				Plant height (cm)				Panicle length (cm)				Grain yield/plant (g)		
		Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Rahuri	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean
40	IC415448	38.0	34.0	35.0	35.7	92.0	70.0	79.0	80.3	90.0	82.0	125.4	99.1	18.0	53.0	57.0	42.7	2.4	11.2	6.8
41	IC415453	41.0	35.0	36.0	37.3	95.0	65.0	62.0	74.0	129.0	54.0	92.2	91.7	29.0	30.0	39.6	32.9	1.1	10.2	5.7
42	IC415462	37.0	32.0	33.0	34.0	91.0	65.0	79.0	78.3	97.0	76.0	105.8	92.9	19.0	42.0	46.2	35.7	1.3	12.2	6.7
43	IC415466	36.0	35.0	32.0	34.3	93.0	65.0	79.0	79.0	88.0	54.0	106.2	82.7	24.0	31.0	46.6	33.9	1.5	12.4	6.9
44	IC421885	37.0	33.0	33.0	34.3	90.0	65.0	62.0	72.3	100.0	55.0	89.2	81.4	18.0	29.0	45.8	30.9	1.1	12.6	6.8
45	IC423398	42.0	36.0	36.0	38.0	94.0	63.0	79.0	78.7	103.0	62.0	122.2	95.7	29.0	32.0	53.4	38.1	0.6	14.0	7.3
46	IC423400	32.0	37.0	45.0	38.0	94.0	82.0	105.0	93.7	136.0	79.0	70.1	95.0	48.0	32.0	42.3	40.8	0.3	4.0	2.2
47	IC423408	35.0	35.0	34.0	34.7	96.0	65.0	62.0	74.3	145.0	48.0	102.6	98.5	47.0	28.0	46.2	40.4	1.1	8.4	4.8
48	IC423410	36.0	29.0	30.0	31.7	91.0	60.0	62.0	71.0	120.0	51.0	93.0	88.0	43.0	30.0	44.4	39.1	1.1	8.6	4.9
49	IC423544	34.0	35.0	34.0	34.3	95.0	65.0	79.0	79.7	120.0	68.0	104.8	97.6	47.0	39.0	39.8	41.9	1.5	9.2	5.4
50	IC423548	33.0	30.0	32.0	31.7	95.0	60.0	62.0	72.3	119.0	61.0	93.4	91.1	50.0	34.0	41.8	41.9	1.4	9.6	5.5
Means for check varieties																				
	Annapurna (C)	48.0	35.0	37.0	40.0	89.0	71.0	89.0	83.0	67.4	69.0	124.2	86.9	21.0	28.0	51.4	33.5	9.0	16.4	12.7
	GA1 (C)	56.0	50.0	46.0	50.7	112.0	92.0	92.0	98.7	157.4	147.0	92.1	132.2	40.0	47.0	42.6	43.2	16.0	11.8	13.9
	GA2 (C)	55.0	51.0	46.0	50.7	106.0	91.0	105.0	100.7	162.0	84.0	148.0	131.3	39.4	26.0	52.6	39.3	12.0	12.6	12.3
	Suvarna (C)			44.0	44.0			79.0	79.0			133.4	133.4			44.8	44.8		18.0	18.0
	Minimum	32.0	29.0	30.0	31.7	89.0	60.0	62.0	71.0	63.0	36.0	70.1	63.9	18.0	22.0	34.6	30.9	0.2	4.0	2.2
	Maximum	56.0	51.0	46.0	50.7	112.0	92.0	105.0	100.7	169.0	152.0	192.8	165.5	60.0	53.0	76.0	53.0	16.0	20.0	18.0
	Mean	41.6	36.1	35.7	37.9	95.7	70.8	73.1	79.8	119.7	72.3	112.0	101.8	37.7	34.4	45.8	39.4	2.0	11.2	6.8
	SD	6.7	5.8	5.3	5.5	4.5	10.7	12.8	7.9	30.4	28.1	27.8	24.6	10.6	6.8	7.2	4.8	2.7	3.3	2.7
	CV(%)	16.1	16.1	15.0	14.4	4.7	15.1	17.5	9.9	25.4	38.8	24.8	24.1	28.0	19.7	15.7	12.1	134.5	29.8	40.3
	Phenotypic																			

Table 108. Promising lines in rice bean germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines	Highest value of best check
Bangalore (Accessions 100)				
1.	Plant height (cm)	19.0-69.6	LRB-118, LRB-99, LRB-53 > (65.0 cm)	RBL-6 (65.5 cm)
2.	No. of branches	1.1-2.4	LRB-1, LRB-71-1 > (2.3)	RBL-35 (2.3)
3.	No. of pods per plant	0.9-39.3	LRB-63 > (39.0)	RBL-50 (39.0)
4.	Days to flowering	41.0-51.0	LRB-54, LRB-25, LRB-21-2, LRB-29-1, LRB-28, LRB-19, LRB-94 < (42.0 days)	RBL-50 (42.0 days)
5.	Days to maturity	72.0-91.0	LRB-114, LRB-35, LRB-18, LRB-116, LRB-10, LRB-26, LRB-21-2, LRB-4, LRB-107, LRB-36, LRB-33-1, LRB-111, LRB-73-1, LRB-50, LRB-6, LRB-24 < (79.0 days)	RBL-35 (82.0 days)
Ludhiana (Accessions 103)				
1.	Days to flowering	59.0-70.0	LRB74-2, RBL35, LRB 6, LRB75-1, LRB77, LRB78 < (61.0 days),	RBL-6 (64.4 days)
2.	Plant height (cm)	44.0-144.0	LRB89, LRB50, LRB71-2, LRB107, LRB35, LRB91, LRB114, LRB100, LRB111, LRB51, LRB92, LRB80, LRB33-1, LRB52, LRB99, LRB94, LRB67, LRB110, LRB72-2, LRB115, LRB31 > (114.0 cm)	RBL-6 (110.7 cm)
3.	100 seed weight (g)	5.5-8.6	LRB66, LRB114, LRB24, LRB49, LRB21, LRB87, LRB85, LRB9, LRB71-2, LRB51, LRB50, LRB22, LRB 10, LRB65, LRB21-1, LRB20, LRB23, LRB13, LRB93, LRB102, LRB 6, LRB54, RBL 50(C3) > (7.5 g)	RBL-6 (7.2 g)
4.	Yield (q/ha)	0.8-35.0	LRB28, LRB102, LRB81, LRB101, LRB99, LRB80, LRB117, LRB17, LRB40-1 > (29.0 q/ha)	RBL-6 (21.7 q/ha)
Rahuri (Accessions 100)				
1.	Days to maturity	59.0-99.0	LRB49, LRB741, LRB712 < (85.0 days)	RBL-35 (85.6 days)
2.	Plant height (cm)	36.0-157.0	LRB7, LRB66, LRB722, LRB49, LRB53, LRB60, LRB62, LRB55, LRB8, LRB2, LRB65, LRB743, LRB50 > (144.0 cm)	RBL-35 (135 cm)
3.	No. of primary branches	3.0-5.0	LRB66, LRB722, LRB62, LRB55, LRB743, LRB50, LRB712, LRB711, LRB85, LRB87, LRB104, LRB46, LRB56, LRB63, LRB101, LRB24, LRB102, LRB52, LRB44, LRB81, LRB23 > (4.0)	RBL-6 (3.9)
4.	No. of pods per plant	4.9-52.0	LRB104, LRB119, LRB101, LRB92, LRB100, LRB109, LRB116, LRB110, LRB87, LRB89, LRB111, LRB94, LRB118 > (47.0)	RBL-6 (38.9)

S.No.	Characters	Range	Promising lines	Highest value of best check
5.	100 seed weight (g)	5.0-5.8	LRB12, LRB13, LRB742, LRB10, LRB212, LRB401, LRB49, LRB116 > (5.5 g)	RBL-35 (5.32 g)
6.	Yield (q/ha)	1.1-17.2	LRB4, LRB22, LRB32, LRB81, LRB63, LRB65, LRB221, LRB17, LRB18, LRB60, LRB5, LRB24, LRB211, LRB31, LRB712, LRB311, LRB7, LRB11, LRB36, LRB14, LRB331, LRB743, LRB29, LRB87, LRB13, LRB26, LRB56, LRB23, LRB25, LRB2, LRB1, LRB10, LRB62, LRB27, LRB34, LRB104 > (11.0 q/ha)	RBL-6 (9.86 q/ha)
Ranchi (Accessions 100)				
1.	Days to flowering	40.0-83.0	LRB 40-1 > (42.5 days)	RBL-35 (42.86 days)
2.	Days to maturity	96.0-120.0	LRB 85, LRB 116 < (97.5 days)	RBL-35 (97.88 days)
3.	Plant height (cm)	73.0-129.5	LRB 19, LRB 11, LRB 5, LRB 8, LRB 28, LRB 1, LRB 2, LRB 81, LRB 51, LRB 91, LRB 115, LRB 73-1, LRB 101, LRB 102, LRB 107, LRB 16, LRB 2, LRB 71-1, LRB 119, LRB 114, LRB 93, LRB 111, LRB 118, LRB 54, LRB 100, LRB 14 > (109.5 cm)	RBL-35 (97.13 cm)
4.	No. of primary branches	1.5-4.5	LRB 75-1, LRB 67, LRB 115, LRB 31, LRB 79, LRB 58, LRB 53, LRB 48, LRB 50, LRB 78, LRB 68, LRB 13, LRB 116 > (3.5)	RBL-50 (2.94)
5.	No. of pods per plant	8.5-36.0	LRB 67, LRB 48, LRB 74-2, LRB 77, LRB 78, LRB 1, LRB 40-1, LRB 87, LRB 100, LRB 4 > (24.5)	RBL-35 (22.06)
6.	Pod length (cm)	6.0-10.0	LRB 1, LRB 40-1, LRB 117, LRB 102, LRB 116, LRB 17, LRB 71-1, LRB 8, LRB 6 > (9.0.0 cm)	RBL-35 (8.38 cm)
7.	Seeds per pods	4.0-9.5	LRB 7, LRB 1, LRB 92, LRB 8, LRB 6, LRB 28, LRB 101, LRB 11, LRB 79 > (8.0)	RBL-6 (7.50)
8.	100 seed weight (g)	5.1-7.8	LRB 55, LRB 77, LRB 75-1, LRB 74-1, LRB 10, LRB 117, LRB 110, LRB 22-1, LRB 21-1, LRB 53, LRB 31, LRB 66, LRB 93, LRB 29, LRB 11, LRB 18, LRB 36 > (7.0 g)	RBL-6 (6.41 g)
Delhi (Accessions 124)				
1.	Days to flowering	40.0-124.0	LRB-28 < (60.0 days)	RBL-35 (60.7 days)
2.	Seeds per pod	5.0-18.0	LRB-45, LRB-15, LRB-79, LRB-14, LRB-116, LRB-12, LRB-17, LRB-67, LRB-43, LRB-68, LRB-33-1, LRB-49, LRB-44, LRB-87, LRB-40-1, LRB- 4-2, LRB-2, LRB-101, LRB-85 > (9.4)	RBL-6 (8.42)

S.No.	Characters	Range	Promising lines	Highest value of best check
3.	Days to maturity	102.0-161.0	LRB-47, IC-364080 < (121.0 days)	RBL-35 (121.0 days)
4.	Plant height (cm)	14.2-185.4	LRB-109, LRB-114, LRB-74-1, LRB-104, LRB-21-1, LRB-46, LRB-24, LRB-77, LRB-29, LRB-73-1, LRB-74-2, LRB-44, LRB-35-1, LRB-117, LRB-22, LRB-8 > (155.0 cm)	RBL-6 (132.81 cm)
5.	No. of primary branches	2.4-9.32	DPRP-57, DPRP-32, LRB-63, DPRP-54, LRB-65, LRB-93, LRB- 7, LRB-52, LRB-66, LRB-62, LRB-12, LRB-74-1, LRB-104, LRB-74-2, LRB-34, LRB-10, LRB-5, LRB-81, LRB-74-3, LRB-54, DPRP-59, LRB-56, LRB-73-1, DPRP-53, LRB-53, DPRP-10 > (5.4)	RBL-6 (4.56)
6.	Seed yield per plant (g)	5.0-95.0	LRB-43, LRB-68, LRB-18, LRB-71-1, LRB-44, LRB-6, LRB-5, LRB-11, LRB-2, LRB-71-2, LRB-118, LRB-33-1, LRB-119, LRB-42, LRB-17, LRB- 7, DPRP-40, LRB-28, LRB-9, LRB-46, LRB-110, LRB-26, LRB-85, LRB- 0, LRB-48, LRB-72-2 > (65.0 g)	RBL-6 (56.36g)
7.	Seed yield (q/ha)	0.8-32.8	LRB-73-1, LRB-74-1, LRB-68, LRB-114, LRB-46, LRB-72-2, LRB-11, LRB-71-2, LRB-109, LRB-115, LRB-119, LRB-107, LRB-6, LRB-77, LRB- 5, LRB-43, LRB-71-1, LRB-117, LRB-2, LRB-87, LRB-28, LRB-40-1 > (3.5 q/ha)	RBL-50 (15.3 q/ha)
8.	100 seed weight (g)	2.8-6.8	LRB-21, LRB-46, LRB-45, LRB-19, IC-364061, LRB-91, IC-364066, LRB-20, LRB-43, LRB-17, LRB-16, LRB-37, LRB-14, LRB-56, LRB-55, LRB-60, LRB-18, LRB-89, LRB-12, LRB-15, LRB-33-1, LRB-94, LRB-10 > (5.7 g)	RBL50 – 5.05
9.	No. of pods per plant	6.0-133.0	LRB-53, LRB-104, LRB-52, LRB-10, LRB-6, LRB-19, LRB-20, LRB-109, LRB-51, LRB-33-1, LRB-74-3, LRB-62, LRB-74-1, LRB-114, LRB-9, LRB-71-2, DPRP-32, LRB-77, LRB-118, LRB-110, LRB-79, LRB-8, LRB-17 > (83.6)	RBL-6 (70.44)
10.	No. of pods per cluster	2.3-5.6	LRB-85, LRB-71-2, LRB-74-2, LRB-52, LRB-24, LRB-80, LRB-17, LRB-67, LRB-15 > (4.8)	RBL-50 (3.8)
S.K. Nagar (Accessions 100)				
1.	Days to flowering	77.0-101.0	LRB-104, LRB-21-2, LRB-93 < (78.0 days)	RBL-35 (81.0 days)
2.	Days to maturity	113.0-146.0	LRB-21-2, LRB-104, LRB-17, LRB-111 < (118.0 days)	RBL-35 (118.0 days)

S.No.	Characters	Range	Promising lines	Highest value of best check
3.	Plant height (cm)	55.5-92.6	LRB-14, LRB-12, LRB-16, LRB-2, LRB-13, LRB-15, LRB-22-1, LRB-1, LRB-21, LRB-104, LRB-11, LRB-6, LRB-52 > (75.0 cm)	RBL-6 (68.98 cm)
4.	Branches per plant	1.3-5.2	LRB-104, LRB-16, LRB -66, LRB -65, LRB-7, LRB-52, LRB-12, LRB-109, LRB-14, LRB-21, LRB-21-1, LRB-107, LRB-19, LRB-35-1, LRB-13, LRB -75-1, LRB -71-1, LRB-11, LRB-6 > (3.19)	RBL-50 (2.39)
5.	Yield per plant (g)	0.2-7.3	LRB-91, LRB-12, LRB-14, LRB-2, LRB-118, LRB-21, LRB-16, LRB-93, LRB-1, LRB-15, LRB-7, LRB-5, LRB-13, LRB-6, LRB-8, LRB-22-1, LRB-92, LRB-19 > (2.10 g)	RBL-50 (1.13g)
Bhubaneshwar (Accessions 120)				
1.	Days to flowering	43.0-51.0	BRB01, BRB12, BRB13, BRB17, BRB18, LRB002, LRB004, LRB005, LRB006, LRB011, LRB017, LRB018, LRB019, LRB029, LRB031, LRB031-1, LRB032, LRB033, LRB035, LRB036, LRB063, LRB065, LRB067, LRB072-2, LRB074-1, LRB074-2, LRB078, LRB079, LRB080, LRB081, LRB085, LRB087, LRB089, LRB117, LRB118 < (44.0 days)	RBL-35 (44.6 days)
2.	Days to maturity	89.0-102.0	LRB022-1, RB024, LRB056, LRB058, LRB060, LRB062, LRB100, LRB101, LRB102, LRB104, LRB055, LRB022, LRB023, LRB025, LRB026, LRB027, LRB028, LRB053, LRB054 < (91.0 days)	RBL-35 (98.0 days)
3.	Plant height (cm)	24.0-89.2	LRB031, BRB08, BRB10, LRB007, LRB009, LRB006, BRB07, LRB047, LRB031-1, LRB043, LRB048, LRB040-1, LRB073-1, LRB042, LRB037, LRB033, LRB036 > (70.2 cm)	RBL-6 (61.7 cm)
4.	Branches per plant	1.0-5.0	BRB20, LRB047, BRB18, BRB08, BRB07, LRB074-1, BRB17, LRB048, LRB110, LRB079, LRB073-1, BRB19, LRB075-1, BRB14 > (3.7)	RBL-35 (2.6)
5.	Clusters per plant	4.0-22.2	BRB19, BRB14, BRB20, LRB006, LRB118, BRB08, BRB10, LRB077, BRB15, LRB047, LRB079, LRB065, BRB17, LRB085 > (16.2)	RBL-50 (11.6)
6.	Pods per plant	8.8-47.2	BRB06, BRB19, BRB15, LRB118, BRB14, LRB043, BRB10, LRB115, BRB08, BRB03, LRB109, LRB047, LRB065, LRB110, BRB09, LRB074-2, LRB001, LRB006, BRB04, LRB051, LRB073-1, BRB13, LRB042, LRB002 > (34.6)	RBL-50 (27.8)
7.	Pod length (cm)	6.5-9.9	LRB050, BRB03, LRB116, LRB085, LRB094, LRB044, LRB023, LRB074-1, BRB19, LRB117, BRB18, LRB114, LRB035, LRB014, LRB034, LRB043, LRB048, LRB119 BRB02 LRB046 > (9.0 cm)	RBL-50 (8.9 cm)

S.No.	Characters	Range	Promising lines	Highest value of best check
8.	Seeds per pod	4.0-9.7	LRB093, BRB10, BRB03, LRB031-1, BRB04, LRB020, BRB05, BRB01, LRB025, LRB099, LRB002, LRB019, LRB094, LRB044, BRB12, LRB079, LRB015, LRB085, LRB091, LRB056, LRB036, LRB116, LRB017, LRB092, LRB053 > (7.0)	RBL-50 (6.6)
9.	100 seed weight (g)	4.2-9.2	LRB065, BRB13, LRB117, LRB118, LRB049, LRB085, LRB014, LRB023, LRB050, LRB016, LRB119, LRB043, BRB02, LRB073-1, LRB087, LRB021, LRB029, BRB03, LRB114, LRB055, LRB032, BRB10, LRB017, LRB075-1, LRB035 > (7.05 g)	RBL-35 (6.6 g)
10.	Seed yield per plant (g)	2.7-17.4	BRB10, BRB20, BRB15, LRB118, LRB019, BRB08, LRB085, LRB077, BRB06, LRB006, BRB01, BRB19, BRB03, LRB102, LRB033-1 > (10.41 g)	RBL-35 (8.3 g)
11.	Yield (q/ha)	3.5-17.3	BRB10, LRB115, BRB06, BRB15, LRB109, BRB19, BRB14, LRB081, BRB08, BRB01, BRB03, LRB110, LRB118, BRB09, BRB07, BRB05, LRB043, LRB020, LRB075-1 > (3.4 q/ha)	RBL-50 (2.39 q/ha)
Best entries over locations (100 Accessions) (Adj. value)				
1.	Plant height (cm)	71.4-109.9	LRB073-1, LRB071-1, LRB071-2, LRB033-1, LRB074-1, LRB114, LRB107, LRB029, LRB072-2, LRB074-2, LRB109 > (100.0 cm)	RBL-50 (100.0 cm)
2.	No. of primary branches	2.2-3.9	LRB075-1, LRB074-3, LRB104, LRB073-1, LRB052, LRB065, LRB074-2, LRB067, LRB074-1, LRB066, LRB035-1, LRB044, LRB063, LRB079, LRB048, LRB072-2, LRB047, LRB045, LRB109 > (3.4)	RBL-50 (2.9)
3.	Seed yield per plant (g)	3.3-31.2	LRB071-2, LRB072-2, LRB034, LRB019, LRB044, LRB073-1, LRB071-1, LRB074-2, LRB007, LRB006, LRB077, LRB045, LRB119, LRB004, LRB074-3, LRB018, LRB043, LRB047, LRB012 > (19.0 g)	RBL-6 (7.0 g)
4.	No. of pods per plant	20.4-45.1	LRB074-2, LRB071-2, LRB109, LRB074-1, LRB053, LRB074-3, LRB073-1, LRB118, LRB104, LRB075-1, LRB033-1 > (40.0)	RBL-35 (37.7)
5.	Seed per pod	5.6-10.8	LRB045, LRB079, LRB012, LRB116, LRB101, LRB017, LRB092, LRB093, LRB014, LRB031-1, LRB015, LRB019, LRB044, LRB056, LRB002 > (7.7)	RBL-50 (7.7)
6.	100 seed weight (g)	5.4-6.8	LRB114, LRB021, LRB117, LRB094, LRB010, LRB065, LRB085, LRB012, LRB111, LRB087, LRB049, LRB016, LRB020 > (6.4 g)	RBL-6 (6.0 g)
7.	Seed yield (q/ha)	9.1-20.5	LRB081, LRB028, LRB073-1, LRB074-1, LRB117, LRB017, LRB043, LRB018, LRB087, LRB119, LRB107, LRB080, LRB006, LRB068, LRB115, LRB071-2, LRB046, LRB071-1, LRB044, LRB101, LRB072-2, LRB065, LRB040-1, LRB118, LRB110, LRB004 > (15.0 q/ha)	RBL-50 (12.9 q/ha)

Table 109. Multilocation evaluation of germplasm lines in rice bean at Rahuri, Bangalore and Mettupalayam – Plains (2005)

S. No.	Accession No.	Days to 50% flowering										Days to maturity																					
		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.		
1	LRB001	86.0	83.2	46.0	59.0	57.0	51.0	93.0	65.0	65.3	64.9	126.0	124.1	80.0	119.0	107.1	94.0	93.6	99.0	134.0	119.0	110.1	112.8										
2	LRB002	85.0	82.2	44.0	65.0	56.0	43.0	82.0	64.0	62.7	62.3	121.0	119.1	88.0	116.0	104.1	93.0	92.6	99.0	136.0	123.0	110.9	107.7										
3	LRB004	90.0	87.2	43.0	66.0	54.0	43.0	79.0	64.0	62.7	62.3	129.0	127.1	78.0	114.0	102.1	92.0	91.6	99.0	137.0	125.0	110.6	110.0										
4	LRB005	86.0	83.2	46.0	68.0	55.0	43.0	79.0	63.0	62.9	62.5	127.0	125.1	83.0	115.0	103.1	92.0	91.6	99.0	136.0	125.0	111.0	108.3										
5	LRB006	85.0	82.2	45.0	44.0	56.0	43.0	82.0	60.0	59.3	58.9	123.0	121.1	78.0	111.0	99.1	93.0	92.6	99.0	136.0	125.0	109.3	108.0										
6	LRB007	87.0	84.2	46.0	70.0	56.0	46.0	75.0	64.0	63.4	63.0	126.0	124.1	80.0	118.0	106.1	96.0	95.6	99.0	137.0	125.0	111.6	109.3										
7	LRB008	90.0	87.2	44.0	69.0	54.0	46.0	82.0	65.0	64.3	63.9	131.0	129.1	84.0	107.0	95.1	90.0	89.6	101.0	135.0	125.0	110.4	107.8										
8	LRB009	91.0	88.2	45.0	65.0	55.0	46.0	89.0	66.0	65.3	64.9	129.0	127.1	81.0	113.0	101.1	93.0	92.6	101.0	135.0	125.0	111.0	109.4										
9	LRB010	92.0	89.2	45.0	49.0	57.0	46.0	72.0	64.0	60.7	60.3	129.0	127.1	77.0	114.0	102.1	90.0	89.6	101.0	134.0	125.0	110.0	108.6										
10	LRB011	87.0	84.2	45.0	61.0	56.0	43.0	72.0	65.0	61.3	60.9	121.0	119.1	80.0	115.0	103.1	89.0	88.6	101.0	136.0	123.0	109.3	106.8										
11	LRB012	94.0	91.2	45.0	66.0	56.0	46.0	103.0	66.0	68.0	67.6	127.0	124.8	81.0	113.0	101.1	93.0	94.6	99.0	131.0	123.0	109.6	107.6										
12	LRB013	92.0	89.2	45.0	65.0	57.0	46.0	103.0	64.0	67.4	67.0	126.0	123.8	80.0	114.0	102.1	94.0	95.6	99.0	133.0	124.0	110.0	108.4										
13	LRB014	91.0	88.2	43.0	69.0	56.0	46.0	90.0	65.0	65.7	65.3	123.0	120.8	80.0	110.0	108.5	93.0	94.6	102.0	135.0	125.0	109.7	109.4										
14	LRB015	91.0	88.2	45.0	66.0	57.0	51.0	82.0	64.0	65.1	64.7	129.0	126.8	81.0	107.0	105.5	94.0	95.6	102.0	135.0	109.0	108.1	107.7										
15	LRB016	94.0	91.2	44.0	63.0	58.0	51.0	79.0	66.0	65.0	64.6	132.0	129.8	80.0	112.0	110.5	95.0	96.6	102.0	130.0	123.0	110.6	110.4										
16	LRB017	79.0	76.2	51.0	52.0	54.0	43.0	72.0	67.0	59.7	59.3	116.0	113.8	88.0	111.0	109.5	89.0	90.6	102.0	133.0	119.0	108.3	106.8										
17	LRB018	90.0	87.2	44.0	58.0	57.0	43.0	79.0	65.0	62.3	61.9	129.0	126.8	77.0	113.0	111.5	94.0	95.6	102.0	131.0	123.0	109.9	111.1										
18	LRB019	95.0	92.2	41.0	56.0	58.0	43.0	79.0	64.0	62.3	61.9	131.0	128.8	80.0	108.0	106.5	95.0	96.6	102.0	133.0	123.0	110.3	109.6										
19	LRB020	94.0	91.2	45.0	57.0	54.0	46.0	83.0	65.0	63.4	63.0	130.0	127.8	85.0	107.0	105.5	89.0	90.6	102.0	133.0	125.0	110.1	109.1										
20	LRB021	87.0	84.2	48.0	67.0	58.0	51.0	93.0	66.0	67.1	66.7	122.0	119.8	79.0	105.0	103.5	95.0	96.6	96.0	135.0	125.0	108.1	108.7										

S. No.	Accession No.	Plant height (cm)												No. of primary branches																	
		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.
1	LRB001	86.2	76.9	48.1	118.5	143.0	142.9	65.2	64.7	126.0	88.0	96.4	95.0	3.2	3.6	2.4	3.5	3.0	2.4	2.3	4.4	4.1	3.1	3.2							
2	LRB002	88.6	79.4	41.5	117.5	145.0	144.9	59.6	59.1	150.6	82.0	97.8	96.4	2.7	3.1	1.8	2.5	4.0	3.4	3.3	4.4	4.1	3.1	3.1							
3	LRB004	65.1	55.9	38.2	109.5	139.0	138.9	61.3	60.8	140.3	98.0	93.1	91.7	3.1	3.5	1.6	3.5	4.0	2.1	2.0	3.8	3.4	3.0	3.0							
4	LRB005	71.5	62.3	55.2	125.5	137.0	136.9	59.6	59.1	147.4	100.0	99.5	98.1	2.9	3.3	1.1	3.5	3.0	2.8	2.7	5.8	5.5	3.2	3.2							
5	LRB006	76.2	67.0	41.0	109.5	135.0	134.9	80.6	80.1	129.6	63.0	90.7	89.3	3.2	3.6	1.8	3.0	4.0	2.6	2.5	3.8	3.5	3.1	3.1							
6	LRB007	69.3	60.0	41.5	104.0	157.0	156.9	81.6	81.1	118.4	96.0	95.4	94.0	4.2	4.6	1.3	3.0	3.0	2.6	2.5	3.2	2.9	2.9	2.9							
7	LRB008	74.3	65.1	30.0	124.0	146.0	145.9	55.8	55.3	157.0	110.0	99.6	98.2	3.1	3.6	1.7	2.0	4.0	1.6	1.5	4.8	4.5	2.9	2.9							
8	LRB009	68.5	59.3	44.1	107.5	144.0	143.9	80.8	80.3	134.4	90.0	95.6	94.2	2.7	3.1	1.3	2.0	3.0	3.2	3.1	4.0	3.7	2.7	2.7							
9	LRB010	61.2	52.0	58.8	104.1	140.0	139.9	57.6	57.1	150.4	44.0	88.0	86.6	2.6	3.0	1.2	3.0	3.0	2.4	2.3	5.8	5.5	3.0	3.0							
10	LRB011	76.2	67.0	46.1	129.5	136.0	135.9	61.0	60.5	130.5	95.0	96.3	94.9	3.2	3.6	1.3	3.0	4.0	1.8	1.7	3.0	2.7	2.7	2.7							
11	LRB012	92.1	92.6	41.5	93.0	139.0	139.6	52.4	51.9	132.0	89.0	91.3	91.4	4.2	4.1	1.5	3.5	3.0	1.6	1.5	6.2	5.0	3.3	3.1							
12	LRB013	88.5	89.0	37.4	73.0	136.0	136.6	38.6	38.1	130.8	73.0	82.5	82.6	3.3	3.2	1.6	4.0	4.0	1.8	1.7	3.4	2.2	3.0	2.8							
13	LRB014	92.6	93.1	42.1	110.0	134.0	134.6	42.2	41.7	119.4	64.0	86.3	86.4	3.9	3.8	1.7	3.5	4.0	2.4	2.3	5.4	4.2	3.5	3.3							
14	LRB015	88.2	88.7	37.2	107.0	143.0	143.6	56.4	55.9	130.6	52.0	87.8	87.9	2.6	2.5	1.4	2.5	3.0	2.4	2.3	3.4	2.2	2.5	2.3							
15	LRB016	89.2	89.7	52.4	112.0	132.0	132.6	42.0	41.5	148.0	106.0	97.4	97.5	5.2	5.1	1.7	3.0	3.0	2.4	2.3	3.8	2.6	3.2	3.0							
16	LRB017	87.5	88.0	47.5	102.0	130.0	130.6	47.6	43.6	128.8	82.0	89.3	88.9	3.1	3.1	1.4	3.0	4.0	2.6	2.8	3.4	2.2	2.9	2.7							
17	LRB018	61.3	61.8	60.2	93.5	133.0	133.6	51.2	47.2	137.6	83.0	88.5	88.1	2.1	2.1	2.2	3.0	4.0	2.2	2.4	3.6	2.4	2.9	2.7							
18	LRB019	71.1	71.6	34.3	129.5	133.0	133.6	50.8	46.8	150.0	90.0	94.1	93.7	3.6	3.5	1.3	2.5	3.0	1.8	2.0	2.6	1.4	2.5	2.3							
19	LRB020	62.2	62.7	43.2	101.0	129.0	129.6	50.6	46.6	127.2	72.0	83.6	83.2	2.2	2.1	1.5	3.0	4.0	2.0	2.2	3.4	2.2	2.7	2.5							
20	LRB021	79.6	80.1	44.5	95.5	136.0	136.6	45.8	41.8	144.2	93.0	91.2	90.8	3.7	3.7	1.4	2.0	4.0	1.6	1.8	3.0	1.8	2.6	2.4							

S. No.	Accession No.	Seed Yield/plant (g)								No. of pod per plant								Pod length (cm)											
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean	
		Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	
1	LRB001	3.7	2.8	0.5	9.4	9.6	50.0	15.9	6.2	3.1	26.0	37.6	38.4	68.4	27.0	32.4	32.6	9.5	8.9	8.8	9.1								
2	LRB002	4.7	3.8	1.9	10.1	10.3	80.0	24.2	16.2	18.1	15.0	35.0	35.8	64.6	29.0	32.3	32.5	8.5	9.5	8.1	8.7								
3	LRB004	0.5	-0.4	0.4	7.5	7.7	60.0	17.1	22.3	4.1	25.0	25.3	26.1	56.2	34.0	28.9	29.1	8.0	7.3	7.8	7.7								
4	LRB005	3.3	2.4	1.5	5.9	6.2	80.0	22.7	17.2	12.4	17.0	23.6	24.4	83.6	20.0	31.3	31.5	8.5	8.6	7.9	8.3								
5	LRB006	2.5	1.6	0.5	11.2	11.4	85.0	24.8	23.6	5.3	13.0	36.8	37.6	98.4	23.0	35.3	35.5	9.5	9.0	8.4	9.0								
6	LRB007	3.4	2.5	0.2	9.0	9.2	60.0	18.1	24.3	0.9	16.0	30.6	31.4	62.4	31.0	28.2	28.3	8.5	7.8	6.9	7.7								
7	LRB008	2.5	1.6	0.2	5.7	6.0	60.0	17.1	16.9	2.6	14.0	24.2	25.0	84.2	22.0	29.4	29.6	9.5	9.7	8.7	9.3								
8	LRB009	1.4	0.5	0.9	9.2	9.5	70.0	20.4	17.5	6.0	20.0	33.2	34.0	89.0	29.0	35.4	35.6	6.5	6.7	8.3	7.2								
9	LRB010	0.7	-0.2	0.5	7.2	7.5	68.0	19.1	19.5	6.8	23.0	30.6	31.4	101.6	28.0	38.0	38.2	7.5	7.8	9.0	8.1								
10	LRB011	1.2	0.3	2.2	5.1	5.4	65.0	18.4	18.5	9.6	18.5	17.6	18.4	65.4	30.0	28.2	28.4	8.5	6.9	8.0	7.8								
11	LRB012	6.4	6.8	0.3	5.6	5.8	55.0	16.8	20.0	3.2	17.0	17.4	18.2	76.4	25.0	27.8	28.0	9.0	8.2	8.6	8.6								
12	LRB013	3.1	3.5	0.7	4.7	4.9	50.0	14.6	15.9	1.5	21.0	15.4	16.2	72.8	28.0	27.7	27.9	8.0	7.3	8.5	7.9								
13	LRB014	4.8	5.2	1.4	4.3	4.5	50.0	15.1	15.1	5.1	18.5	18.2	19.0	71.0	29.0	28.4	28.5	8.5	10.7	9.2	9.5								
14	LRB015	3.5	3.9	0.7	6.3	6.5	57.0	16.9	15.5	4.0	14.0	20.2	21.0	71.8	21.0	26.2	26.4	6.5	9.1	7.7	7.8								
15	LRB016	3.7	4.1	0.6	3.3	3.5	55.0	15.7	16.3	3.6	18.5	12.6	13.4	66.4	21.0	24.4	24.6	7.5	8.7	7.6	7.9								
16	LRB017	1.7	2.1	0.3	6.9	7.7	75.0	21.0	16.3	2.5	15.5	21.6	22.2	84.0	33.0	31.3	31.4	9.5	9.6	9.0	9.4								
17	LRB018	0.7	1.1	0.5	8.7	9.6	90.0	25.0	21.5	5.0	16.0	24.8	25.4	71.0	31.0	29.6	29.7	7.5	9.4	8.5	8.5								
18	LRB019	2.2	2.6	0.9	13.7	14.5	50.0	16.7	26.9	3.9	13.5	26.2	26.8	95.6	26.0	33.0	33.2	8.5	8.9	9.0	8.8								
19	LRB020	0.5	0.9	0.3	7.6	8.4	40.0	12.1	15.1	2.5	21.5	26.4	27.0	95.2	29.0	34.9	35.0	7.0	9.4	8.8	8.4								
20	LRB021	4.4	4.7	0.8	3.1	3.9	49.0	14.3	12.2	7.3	19.0	9.4	10.0	75.0	24.0	26.9	27.1	8.5	9.8	8.5	8.9								

S. No.	Accession No.	Seeds per pod						100 seed wt (g)										
		Ranchi		Bhubneshwar		Delhi	Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean	
		Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.
1	LRB001	9.0	5.2	5.4	8.0	6.9	7.5	6.6	6.3	5.0	6.1	6.3	5.0	4.7	5.5	5.7	5.6	
2	LRB002	6.0	7.5	7.7	9.6	7.7	7.8	6.4	6.0	5.1	5.8	6.0	4.5	4.2	7.2	5.8	5.7	
3	LRB004	7.0	6.1	6.3	7.0	6.6	6.8	6.0	5.6	5.4	5.6	5.8	5.0	4.7	6.9	5.8	5.7	
4	LRB005	7.0	4.6	4.8	7.4	5.9	6.4	5.8	5.4	5.5	5.8	6.0	5.5	5.2	7.2	5.9	5.9	
5	LRB006	8.5	4.6	4.8	8.6	6.6	7.3	6.4	6.1	5.5	6.1	6.3	5.0	4.7	7.7	6.1	6.1	
6	LRB007	9.5	5.6	5.8	7.4	7.1	7.6	6.2	5.9	5.0	5.7	5.9	4.5	4.2	7.4	5.8	5.7	
7	LRB008	8.5	6.3	6.5	7.6	7.2	7.5	5.7	5.4	5.4	6.2	6.4	5.0	4.7	7.3	5.8	5.8	
8	LRB009	5.5	4.8	5.0	6.2	5.4	5.6	6.3	5.9	5.3	6.8	7.0	5.3	5.0	8.0	6.3	6.2	
9	LRB010	6.0	5.8	6.0	6.8	6.1	6.3	7.4	7.1	5.6	6.5	6.7	6.0	5.7	7.9	6.7	6.6	
10	LRB011	8.5	6.5	6.7	6.6	7.1	7.3	7.0	6.7	5.4	6.4	6.6	4.5	4.2	7.0	6.2	6.0	
11	LRB012	8.0	6.4	6.6	10.6	7.9	8.4	6.9	6.5	5.8	6.9	7.1	6.0	6.0	7.4	6.6	6.6	
12	LRB013	8.0	5.2	5.4	7.8	6.6	7.1	5.9	5.5	5.7	6.5	6.7	5.8	5.7	7.7	6.2	6.3	
13	LRB014	7.0	6.4	6.6	10.6	7.6	8.1	6.2	6.3	5.3	7.6	7.8	6.0	6.0	6.8	6.4	6.4	
14	LRB015	5.5	7.3	7.5	11.2	7.9	8.1	6.5	6.6	5.4	6.6	6.8	6.0	6.0	6.2	6.2	6.2	
15	LRB016	6.0	5.3	5.5	9.2	6.5	6.9	6.2	6.3	5.5	7.6	7.8	6.0	6.0	6.9	6.4	6.5	
16	LRB017	7.5	7.1	7.0	10.2	8.0	8.2	5.6	5.7	5.2	7.2	6.9	6.0	6.0	6.9	6.1	6.1	
17	LRB018	6.0	6.6	6.5	8.6	6.9	7.0	7.0	7.1	5.0	6.6	6.3	6.0	6.0	7.0	6.5	6.3	
18	LRB019	8.0	7.4	7.3	8.4	7.8	7.9	6.1	6.2	5.2	7.0	6.6	6.5	6.5	7.4	6.4	6.4	
19	LRB020	7.0	7.7	7.6	8.6	7.7	7.7	6.7	6.8	5.4	6.8	6.4	6.0	6.0	7.8	6.6	6.5	
20	LRB021	8.0	6.2	6.1	8.8	7.3	7.6	5.9	6.0	5.4	7.4	7.0	6.8	6.7	8.3	6.6	6.7	

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	Ludhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
1	LRB001	57.0	35.0	85.0	59.0	11.7	8.5	9.4	10.1	11.1	22.1	13.6	12.9	15.8	15.7	4.4	4.0
2	LRB002	58.0	45.0	85.0	62.7	11.7	8.5	11.5	12.3	20.6	17.5	15.3	14.7	11.8	11.7	3.6	4.0
3	LRB004	59.0	31.0	85.0	58.3	17.2	14.0	11.5	12.3	15.8	18.3	15.7	15.1	8.4	8.3	4.2	4.0
4	LRB005	51.0	42.0	75.0	56.0	8.3	5.1	8.7	9.4	18.1	8.8	10.9	10.3	12.2	12.1	3.0	4.2
5	LRB006	57.0	35.0	85.0	59.0	13.9	10.7	11.7	12.5	22.2	19.6	16.9	16.2	19.8	19.7	4.2	4.0
6	LRB007	59.0	37.0	85.0	60.3	13.5	10.3	11.5	12.3	12.5	14.6	13.0	12.4	15.0	14.9	4.0	4.2
7	LRB008	52.0	36.0	85.0	57.7	7.8	4.6	6.9	7.6	18.1	17.1	12.5	11.8	10.8	10.7	3.8	3.2
8	LRB009	58.0	33.0	85.0	58.7	1.1	-2.1	9.4	10.1	18.6	20.4	12.4	11.8	11.6	11.5	4.4	3.7
9	LRB010	57.0	29.0	75.0	53.7	11.1	7.9	9.0	9.8	16.7	4.2	10.2	9.6	12.6	12.5	3.4	1.5
10	LRB011	57.0	32.0	70.0	53.0	13.3	10.1	6.7	7.5	13.3	8.3	10.4	9.8	7.4	7.3	4.8	4.5
11	LRB012	53.0	55.0	80.0	62.7	9.7	10.1	8.1	8.8	12.2	11.3	10.3	10.6	7.2	7.1	3.6	5.0
12	LRB013	57.0	53.0	80.0	63.3	11.7	12.0	6.7	7.5	12.8	10.4	10.4	10.7	7.2	7.1	4.0	4.2
13	LRB014	59.0	50.0	85.0	64.7	12.8	13.1	4.8	5.5	14.7	20.0	13.1	13.3	7.8	7.7	3.6	4.0
14	LRB015	55.0	44.0	70.0	56.3	9.4	9.8	7.1	7.8	11.4	7.9	9.0	9.2	11.6	11.5	5.0	3.0
15	LRB016	58.0	59.0	85.0	67.3	9.7	10.1	6.5	7.3	15.8	17.5	12.4	12.7	5.6	5.5	3.8	7.0
16	LRB017	57.0	48.0	80.0	61.7	14.7	15.1	7.1	8.2	17.2	29.2	17.1	17.4	9.6	10.1	5.0	3.7
17	LRB018	59.0	40.0	75.0	58.0	13.9	14.2	9.4	10.5	16.7	25.8	16.5	16.8	11.0	11.5	4.4	4.7
18	LRB019	52.0	46.0	80.0	59.3	7.2	7.6	12.3	13.4	10.3	9.2	9.7	10.1	12.6	13.1	3.6	5.2
19	LRB020	58.0	57.0	75.0	63.3	10.6	10.9	13.1	14.2	12.5	10.8	11.7	12.1	11.0	11.5	4.8	3.0
20	LRB021	51.0	48.0	80.0	59.7	9.4	9.8	6.3	7.5	9.4	13.3	9.6	10.0	5.4	5.9	2.3	2.7

S. No.	Accession No.	Days to 50% flowering										Days to maturity											
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean			
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.		
21	LRB021-1	87.0	84.5		58.0	55.0	51.0	96.0	67.0	69.0	68.6	122.0	121.1		104.0	102.5	92.0	93.3	96.0	138.0	125.0	112.8	107.8
22	LRB021-2	77.0	74.5		68.0	58.0	51.0	82.0	65.0	66.8	66.4	113.0	112.1		105.0	103.5	97.0	98.3	96.0	136.0	125.0	112.0	111.8
23	LRB022	87.0	84.5	46.0	56.0	54.0	51.0	79.0	65.0	62.6	62.2	120.0	119.1	81.0	102.0	100.5	89.0	90.3	89.0	135.0	125.0	105.9	109.8
24	LRB022-1	92.0	89.5		53.0	56.0	46.0	79.0	63.0	64.8	64.4	129.0	128.1		107.0	105.5	93.0	94.3	89.0	135.0	125.0	113.0	108.3
25	LRB023	92.0	89.5	45.0	70.0	56.0	51.0	77.0	67.0	65.4	65.1	133.0	132.1	80.0	113.0	111.8	93.0	94.3	89.0	135.0	125.0	109.7	114.5
26	LRB024	99.0	96.5	48.0	55.0	54.0	46.0	82.0	64.0	64.0	63.6	138.0	137.1	78.0	114.0	112.8	89.0	90.3	89.0	135.0	125.0	109.7	109.9
27	LRB025	100.0	97.5	45.0	64.0	57.0	51.0	85.0	65.0	66.7	66.4	142.0	141.1	80.0	112.0	110.8	95.0	96.3	89.0	137.0	123.0	111.1	110.7
28	LRB026	95.0	92.5	41.0	65.0	54.0	51.0	93.0	66.0	66.4	66.1	132.0	131.1	79.0	112.0	110.8	89.0	90.3	89.0	136.0	119.0	108.0	108.0
29	LRB027	95.0	92.5	45.0	63.0	56.0	51.0	93.0	65.0	66.9	66.5	134.0	133.1	77.0	111.0	109.8	93.0	94.3	89.0	123.0	121.0	106.9	107.0
30	LRB028	95.0	92.5	41.0	83.0	55.0	51.0	40.0	65.0	61.4	61.1	136.0	135.1	85.0	109.0	107.8	92.0	93.3	89.0	124.0	122.0	108.1	106.9
31	LRB029	92.0	96.5		55.0	55.0	43.0	93.0	63.0	66.8	67.6	129.0	130.8		114.0	112.8	92.0	93.0	91.0	131.0	125.0	113.7	109.8
32	LRB031	90.0	94.5	45.0	54.0	55.0	43.0	79.0	66.0	61.7	62.4	128.0	129.8	87.0	110.0	108.8	92.0	93.0	91.0	126.0	125.0	108.4	112.3
33	LRB031-1	92.0	96.5		50.0	54.0	43.0	72.0	66.0	62.8	63.6	127.0	128.8		111.0	109.8	89.0	90.0	98.0	121.0	125.0	111.8	108.5
34	LRB032	87.0	91.5	45.0	51.0	56.0	43.0	79.0	65.0	60.9	61.5	123.0	124.8	80.0	116.0	114.8	93.0	94.0	98.0	136.0	125.0	110.1	115.4
35	LRB033	90.0	94.5	45.0	53.0	58.0	43.0	93.0	65.0	63.9	64.5	128.0	129.8	80.0	109.0	107.8	95.0	96.0	98.0	132.0	125.0	109.6	109.8
36	LRB033-1	92.0	96.5		64.0	56.0	46.0	93.0	67.0	69.7	70.4	121.0	122.8		111.0	109.8	93.0	94.0	98.0	136.0	125.0	114.0	109.4
37	LRB034	98.0	102.5	48.0	55.0	58.0	46.0	90.0	67.0	66.0	66.6	134.0	135.8	79.0	110.0	115.8	95.0	96.0	98.0	135.0	125.0	110.9	117.6
38	LRB035	92.0	96.5	44.0	53.0	59.0	43.0	89.0	65.0	63.6	64.2	129.0	130.8	75.0	111.0	116.8	96.0	97.0	98.0	138.0	125.0	110.3	112.1
39	LRB035-1	92.0	96.5		57.0	48.0	51.0	89.0	66.0	67.2	67.9	128.0	129.8		111.0	116.8	93.0	94.0	98.0	138.0	121.0	114.8	110.4
40	LRB036	100.0	104.5	44.0	62.0	54.0	43.0	100.0	65.0	66.9	67.5	143.0	144.8	78.0	117.0	122.8	89.0	90.0	101.0	138.0	121.0	112.4	119.6

S. No.	Accession No.	Plant height (cm)												No. of primary branches																	
		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.
21	LRB021-1	75.5	73.9			90.0	127.0	122.3	31.2	27.2	166.6	84.0	95.7	94.0	3.7	3.7			2.0	4.0	1.6	1.8	3.0	3.0	2.9	2.9					
22	LRB021-2	65.3	63.7			75.5	125.0	120.3	45.4	41.4	126.4	92.0	88.3	86.5	2.5	2.5			2.0	3.0	1.2	1.4	4.2	4.2	2.6	2.6					
23	LRB022	69.9	68.3	61.5		78.0	133.0	128.3	44.2	40.2	157.2	82.0	89.4	87.9	2.9	2.9	1.3		2.0	4.0	1.0	1.2	5.2	5.2	2.7	2.8					
24	LRB022-1	86.3	84.7			89.0	131.0	126.3	44.2	40.2	124.2	75.0	91.6	89.9	2.2	2.2			2.5	4.0	1.0	1.2	3.6	3.6	2.7	2.7					
25	LRB023	72.1	70.5	42.2		92.5	129.0	124.3	47.6	43.6	136.4	85.0	86.4	84.9	1.5	1.5	2.0		1.5	5.0	1.4	1.6	5.2	5.2	2.8	2.8					
26	LRB024	62.1	60.5	58.5		79.0	134.0	129.3	34.0	30.0	165.2	85.0	88.3	86.8	1.9	1.9	1.9		2.5	5.0	1.0	1.2	5.4	5.4	2.9	3.0					
27	LRB025	68.5	67.0	45.7		101.0	130.0	125.3	33.8	29.8	148.6	92.0	88.5	87.0	2.5	2.5	1.9		2.5	4.0	1.6	1.8	3.4	3.4	2.6	2.7					
28	LRB026	62.2	60.6	53.0		79.2	118.0	113.3	31.0	27.0	134.6	87.0	80.7	79.2	2.1	2.2	1.4		3.0	4.0	1.4	1.6	3.8	3.8	2.6	2.7					
29	LRB027	61.5	59.9	41.9		90.5	137.0	132.3	31.0	27.0	120.4	114.0	85.2	83.7	3.1	3.2	2.0		2.0	4.0	1.0	1.2	5.4	5.4	2.9	3.0					
30	LRB028	69.9	68.3	29.2		122.5	126.0	121.3	24.0	20.0	135.2	102.0	87.0	85.5	2.2	2.2	1.9		2.0	3.0	1.0	1.2	4.2	4.2	2.4	2.4					
31	LRB029	66.3	68.7			106.5	132.0	137.9	58.6	57.1	164.4	79.0	101.1	102.3	2.5	2.7			2.5	4.0	1.6	1.7	3.8	4.5	2.9	3.1					
32	LRB031	72.1	74.5	45.2		105.0	133.0	138.9	89.2	87.7	127.8	115.0	98.2	99.2	2.3	2.5	2.0		4.0	4.0	1.6	1.7	4.0	4.7	3.0	3.1					
33	LRB031-1	59.3	61.7			92.0	124.0	129.9	75.0	73.5	135.4	93.0	96.4	97.6	2.3	2.4			2.0	4.0	2.2	2.3	3.4	4.1	2.8	3.0					
34	LRB032	63.2	65.6	41.5		101.0	132.0	137.9	67.4	65.9	116.6	100.0	88.8	89.8	3.2	3.3	1.9		2.5	4.0	2.4	2.5	2.6	3.3	2.8	2.9					
35	LRB033	68.2	70.7	33.2		95.7	118.0	123.9	71.6	70.1	141.2	112.0	91.4	92.4	3.2	3.3	1.5		2.5	3.0	1.8	1.9	3.8	4.5	2.6	2.8					
36	LRB033-1	62.1	64.5			92.0	124.0	129.9	69.4	67.9	152.0	120.0	103.3	104.4	2.2	2.3			2.0	4.0	3.0	3.1	4.2	4.9	3.1	3.3					
37	LRB034	68.3	70.7	53.9		107.5	120.0	125.9	60.4	58.9	150.8	110-	93.5	94.6	3.2	3.3	1.3		1.5	4.0	2.0	2.1	5.8	6.5	3.0	3.1					
38	LRB035	69.5	71.9	47.0		103.0	133.0	138.9	60.0	58.5	129.0	128.0	95.6	96.6	2.2	2.3	1.8		2.5	3.0	2.8	2.9	4.8	5.5	2.8	3.0					
39	LRB035-1	67.8	70.2			94.0	123.0	128.9	57.6	56.1	159.2	85.0	97.8	98.9	3.3	3.4			2.5	3.0	2.6	2.7	5.0	5.7	3.3	3.5					
40	LRB036	68.2	70.7	62.0		79.0	119.0	124.9	71.0	69.5	88.2	97.0	83.5	84.5	2.2	2.3	1.4		2.0	4.0	2.6	2.7	4.6	5.3	2.8	3.0					

S. No.	Accession No.	Seed Yield/plant (g)								No. of pod per plant								Pod length (cm)											
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean	
		Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	
21	LRB021-1	0.8	0.5		3.4	4.2	10.0	4.7	13.6			12.0	12.6	13.2	42.4	29.0	24.0	24.2			7.5	8.0	8.6	8.0					
22	LRB021-2	0.7	0.5		4.2	5.1	30.0	11.6	5.2			15.0	10.2	10.8	36.0	26.0	21.8	22.0			7.0	10.2	7.6	8.3					
23	LRB022	1.9	1.6	3.3	6.0	6.8	35.0	11.5	12.8	16.3		10.5	19.8	20.4	38.2	32.0	23.4	23.5			7.5	8.2	7.9	7.9					
24	LRB022-1	2.4	2.1		4.1	5.0	20.0	8.8	11.3			18.0	16.2	16.8	50.0	26.0	27.6	27.7			7.0	7.6	8.2	7.6					
25	LRB023	0.5	0.2	0.6	5.7	6.5	35.0	10.4	8.9	3.7		12.5	17.4	18.0	52.2	29.0	23.0	23.1			8.5	8.7	9.6	8.9					
26	LRB024	0.8	0.5	0.2	4.1	5.0	50.0	13.8	10.3	1.4		18.0	13.0	13.6	69.0	29.0	26.1	26.2			8.0	9.3	7.7	8.3					
27	LRB025	1.2	0.9	0.0	5.2	6.1	35.0	10.4	14.3	3.6		12.0	14.0	14.6	74.8	25.0	25.9	26.0			8.5	9.3	9.0	8.9					
28	LRB026	0.7	0.4	1.7	4.3	5.2	70.0	19.2	10.1	8.7		14.5	11.9	12.5	60.8	29.0	25.0	25.1			8.0	7.8	8.1	8.0					
29	LRB027	1.1	0.8	0.8	4.8	5.7	45.0	12.9	19.6	5.6		17.0	16.8	17.4	59.4	24.0	24.6	24.7			7.0	8.7	7.4	7.7					
30	LRB028	0.7	0.4	0.3	2.9	3.7	70.0	18.5	12.5	4.5		21.5	11.2	11.8	56.2	25.0	23.7	23.8			9.0	8.0	8.6	8.5					
31	LRB029	1.2	1.7		3.5	4.0	55.0	19.9	19.0			12.0	11.0	11.2	81.6	27.0	32.9	33.0			8.0	7.9	7.9	7.9					
32	LRB031	1.0	1.5	0.2	2.7	3.2	30.0	8.5	19.9	3.8		15.5	11.4	11.6	45.0	26.0	20.3	20.4			7.5	9.2	8.4	8.4					
33	LRB031-1	0.3	0.8		4.3	4.9	35.0	13.2	9.0			14.0	14.4	14.6	62.0	23.0	28.4	28.4			8.5	8.7	8.8	8.7					
34	LRB032	0.7	1.2	0.2	5.9	6.5	30.0	9.2	14.2	1.3		15.5	28.2	28.4	42.2	27.0	22.8	22.9			8.0	7.6	7.8	7.8					
35	LRB033	1.1	1.6	0.3	6.3	6.8	35.0	10.7	9.7	2.5		23.0	23.8	24.0	67.2	21.0	27.5	27.5			8.0	8.6	8.6	8.4					
36	LRB033-1	0.7	1.2		10.8	11.4	75.0	28.8	12.0			14.0	34.4	34.6	91.4	26.0	41.5	41.5			8.5	10.0	8.8	9.1					
37	LRB034	0.7	1.2	0.9	4.3	4.8	45.0	12.7	27.0	5.1		12.5	16.8	17.0	67.6	23.0	25.0	25.0			8.5	9.3	9.2	9.0					
38	LRB035	0.8	1.3	1.0	5.9	6.5	50.0	14.4	13.4	5.6		15.0	20.6	20.8	75.0	22.0	27.6	27.7			7.5	8.8	9.2	8.5					
39	LRB035-1	0.5	1.0		6.5	7.1	15.0	7.4	14.8			19.5	29.0	29.2	72.2	21.0	35.4	35.5			8.0	10.2	8.2	8.8					
40	LRB036	0.9	1.4	1.7	9.7	10.2	40.0	13.1	8.9	10.1		9.0	34.2	34.4	46.8	27.0	25.4	25.5			7.5	6.1	8.2	7.3					

S. No.	Accession No.	Seeds per pod						100 seed wt (g)										
		Ranchi		Bhubneshwar		Delhi	Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean	
		Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	
21	LRB021-1	6.5	4.8	4.7	7.2	5.8	6.1	7.2	7.3	5.4	5.7	5.4	5.2	4.9	7.8	6.4	6.1	
22	LRB021-2	6.5	5.8	5.7	9.0	6.8	7.1	6.8	6.9	5.6	7.0	6.6	3.5	3.2	7.2	6.2	5.9	
23	LRB022	7.0	6.2	6.1	8.0	6.8	7.0	6.0	6.1	5.5	5.5	5.1	5.5	5.2	7.9	6.1	6.0	
24	LRB022-1	6.0	6.0	5.9	7.6	6.4	6.5	7.2	7.3	5.2	4.2	3.9	3.5	3.2	7.5	5.8	5.4	
25	LRB023	8.0	6.3	6.2	8.0	7.1	7.4	5.9	5.6	5.4	7.6	7.3	4.0	3.7	7.8	6.1	6.0	
26	LRB024	7.0	6.6	6.5	9.0	7.3	7.5	6.3	6.0	5.4	5.5	5.2	5.0	4.7	8.5	6.1	6.0	
27	LRB025	7.5	7.5	7.4	7.8	7.6	7.6	6.4	6.1	5.3	6.8	6.5	4.0	3.7	7.0	5.9	5.7	
28	LRB026	7.0	6.5	6.4	7.0	6.7	6.8	6.0	5.7	5.5	6.3	6.0	5.3	5.0	6.2	5.8	5.7	
29	LRB027	5.5	6.1	6.0	8.4	6.5	6.6	5.8	5.5	5.4	5.6	5.3	5.5	5.2	6.6	5.7	5.6	
30	LRB028	8.5	6.3	6.2	7.4	7.1	7.4	6.4	6.1	5.5	6.0	5.7	4.5	4.2	7.4	6.0	5.8	
31	LRB029	6.0	5.9	6.1	7.8	6.4	6.6	7.1	6.8	5.3	7.4	7.2	5.1	5.7	7.3	6.5	6.4	
32	LRB031	7.0	5.9	6.1	7.8	6.7	7.0	7.1	6.8	5.4	5.2	5.1	4.5	5.1	6.9	6.0	5.9	
33	LRB031-1	7.5	7.9	8.1	8.6	8.0	8.1	6.1	5.8	5.5	6.7	6.6	5.0	5.6	6.9	6.0	6.1	
34	LRB032	6.5	4.0	4.2	6.6	5.3	5.8	5.8	5.5	5.4	7.3	7.1	5.5	6.1	6.6	6.0	6.1	
35	LRB033	7.5	6.3	6.5	8.6	7.2	7.5	5.1	4.8	5.1	6.1	6.0	4.5	5.1	7.2	5.5	5.6	
36	LRB033-1	7.5	5.5	5.7	10.0	7.2	7.7	6.1	5.8	5.5	7.0	6.9	6.0	6.6	6.7	6.2	6.3	
37	LRB034	7.5	6.2	6.4	8.8	7.2	7.6	6.2	6.2	5.4	6.6	6.5	5.5	6.1	7.5	6.2	6.3	
38	LRB035	7.0	4.6	4.8	7.6	6.0	6.5	6.3	6.3	5.2	7.1	7.0	5.5	6.1	7.1	6.2	6.3	
39	LRB035-1	7.0	6.2	6.4	9.0	7.1	7.5	5.9	5.9	5.3	5.6	5.5	5.5	6.1	6.9	5.8	5.9	
40	LRB036	6.0	7.2	7.4	5.0	6.4	6.1	7.0	7.0	5.2	5.8	5.7	5.5	6.1	6.9	6.2	6.2	

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	Ludhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
21	LRB021-1	59.0	12.0	80.0	50.3	13.9	15.0	10.2	11.3	5.6	16.3	11.5	12.0	7.4	7.9	3.6	4.2
22	LRB021-2	49.0	15.0	85.0	49.7	10.8	11.9	7.7	8.8	8.9	16.7	11.0	11.6	4.0	4.5	4.6	4.0
23	LRB022	59.0	10.0	85.0	51.3	16.7	17.7	6.9	8.0	10.6	14.6	12.2	12.7	9.6	10.1	4.2	3.0
24	LRB022-1	54.0	20.0	80.0	51.3	15.0	16.1	6.5	7.6	7.8	10.4	9.9	10.5	8.6	9.1	3.2	4.2
25	LRB023	58.0	19.0	80.0	52.3	11.7	12.7	8.8	10.0	8.9	15.0	11.1	11.6	9.4	9.9	3.4	2.7
26	LRB024	56.0	28.0	75.0	53.0	13.9	15.0	6.5	7.6	15.6	17.5	13.4	13.9	6.8	7.3	5.2	4.2
27	LRB025	57.0	32.0	80.0	56.3	11.7	12.7	5.8	6.9	21.9	10.8	12.6	13.1	7.2	7.7	4.4	1.3
28	LRB026	55.0	25.0	85.0	55.0	11.7	12.7	4.8	5.9	18.3	22.1	14.2	14.8	6.0	6.5	4.2	3.5
29	LRB027	58.0	27.0	85.0	56.7	11.1	12.2	4.8	5.9	9.7	25.8	12.9	13.4	8.0	8.5	4.2	6.7
30	LRB028	53.0	22.0	85.0	53.3	10.6	11.6	4.6	5.7	20.0	36.3	17.9	18.4	6.2	6.7	3.4	4.7
31	LRB029	56.0	28.0	85.0	56.3	12.2	12.0	6.5	7.6	15.0	22.5	14.1	14.3	6.2	7.3	4.4	5.0
32	LRB031	59.0	19.0	85.0	54.3	13.9	13.7	7.5	8.5	6.9	18.3	11.7	11.9	6.0	7.1	2.8	5.5
33	LRB031-1	58.0	20.0	80.0	52.7	13.6	13.4	7.7	8.7	7.8	10.0	9.8	10.0	7.6	8.7	3.8	5.2
34	LRB032	57.0	20.0	80.0	52.3	16.7	16.5	10.8	11.8	3.9	26.7	14.5	14.7	10.6	11.7	4.2	5.0
35	LRB033	54.0	33.0	85.0	57.3	10.3	10.1	10.8	11.8	11.7	18.8	12.9	13.1	10.4	11.5	3.6	5.2
36	LRB033-1	58.0	29.0	85.0	57.3	12.5	12.3	11.7	12.8	10.0	18.8	13.2	13.5	14.4	15.5	3.6	6.5
37	LRB034	57.0	32.0	80.0	56.3	11.1	10.9	6.5	7.6	9.4	16.7	10.9	11.2	7.2	8.3	4.0	3.7
38	LRB035	52.0	35.0	85.0	57.3	10.0	9.8	6.0	7.0	10.6	20.8	11.8	12.1	10.2	11.3	4.8	4.7
39	LRB035-1	50.0	27.0	80.0	52.3	6.4	6.2	10.8	11.8	3.3	15.0	8.9	9.1	13.2	14.3	4.0	5.0
40	LRB036	55.0	19.0	80.0	51.3	13.3	13.1	10.6	11.6	5.3	22.9	13.0	13.2	15.2	16.3	3.0	4.0

S. No.	Accession No.	Days to 50% flowering										Days to maturity											
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean			
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	
41	LRB037	95.0	104.5	44.0	64.0	56.0	46.0	85.0	67.0	65.3	66.6	132.0	140.8	83.0	114.0	119.8	93.0	96.3	101.0	135.0	121.0	111.3	113.1
42	LRB040-1	95.0	104.5		42.0	55.0	51.0	90.0	68.0	66.8	68.4	134.0	142.8		116.0	121.8	93.0	96.3	101.0	137.0	121.0	117.0	114.7
43	LRB042	95.0	104.5	45.0	57.0	58.0	51.0	82.0	64.0	64.6	65.9	132.0	140.8	89.0	113.0	118.8	95.0	98.3	101.0	137.0	121.0	112.6	119.5
44	LRB043	95.0	104.5	44.0	59.0	55.0	46.0	73.0	61.0	61.9	63.2	132.0	140.8	80.0	112.0	117.8	93.0	96.3	101.0	134.0	125.0	111.0	114.8
45	LRB044	92.0	101.5	44.0	53.0	56.0	46.0	75.0	68.0	62.0	63.4	130.0	138.8	84.0	99.0	104.8	93.0	96.3	101.0	132.0	125.0	109.1	111.1
46	LRB045	97.0	106.5	44.0	53.0	58.0	51.0	89.0	66.0	65.4	66.8	139.0	147.8	80.0	112.0	117.8	95.0	98.3	98.0	135.0	125.0	112.0	115.1
47	LRB046	92.0	101.5	46.0	60.0	59.0	51.0	70.0	65.0	63.3	64.6	129.0	137.8	81.0	105.0	110.8	96.0	99.3	97.0	136.0	125.0	109.9	112.3
48	LRB047	92.0	101.5	44.0	57.0	60.0	51.0	90.0	65.0	65.6	66.9	131.0	139.8	79.0	107.0	112.8	97.0	100.3	98.0	102.0	125.0	105.6	108.4
49	LRB048	94.0	103.5	46.0	52.0	55.0	46.0	90.0	66.0	64.1	65.5	136.0	144.8	83.0	104.0	110.1	93.0	96.3	98.0	136.0	125.0	110.7	112.7
50	LRB049	92.0	101.5	46.0	65.0	54.0	46.0	87.0	66.0	65.1	66.5	128.0	136.8	82.0	99.0	105.1	59.0	62.3	98.0	137.0	125.0	104.0	106.7
51	LRB050	97.0	106.9	45.0	64.0	61.0	51.0	83.0	68.0	67.0	68.4	136.0	145.4	78.0	107.0	113.1	96.0	99.3	97.0	132.0	125.0	110.1	113.4
52	LRB051	90.0	99.9	44.0	55.0	60.0	51.0	85.0	70.0	65.0	66.4	129.0	138.4	87.0	109.0	115.1	95.0	98.3	97.0	132.0	125.0	110.6	112.0
53	LRB052	92.0	101.9	44.0	65.0	61.0	51.0	79.0	66.0	65.4	66.8	131.0	140.4	80.0	100.0	106.1	97.0	100.3	96.0	131.0	125.0	108.6	112.3
54	LRB053	92.0	101.9	44.0	68.0	60.0	51.0	89.0	67.0	67.3	68.7	130.0	139.4	79.0	111.0	117.1	96.0	99.3	89.0	131.0	125.0	108.7	111.6
55	LRB054	97.0	106.9	41.0	63.0	58.0	51.0	89.0	67.0	66.6	68.0	137.0	146.4	80.0	110.0	116.1	95.0	98.3	89.0	133.0	125.0	109.9	112.4
56	LRB055	99.0	108.9	46.0	69.0	63.0	47.0	92.0	67.0	69.0	70.4	139.0	148.4	80.0	111.0	117.1	99.0	102.3	89.0	131.0	125.0	110.6	113.3
57	LRB056	92.0	101.9	45.0	48.0	62.0	46.0	82.0	64.0	62.7	64.1	126.0	135.4	84.0	109.0	115.1	98.0	101.3	89.0	128.0	123.0	108.1	110.3
58	LRB058	98.0	107.9	44.0	54.0	61.0	46.0	89.0	66.0	65.4	66.8	141.0	150.4	79.0	105.0	111.1	97.0	100.3	89.0	128.0	122.0	108.7	112.1
59	LRB060	92.0	101.9	44.0	55.0	56.0	46.0	91.0	67.0	64.4	65.8	135.0	144.4	84.0	102.0	108.1	95.0	98.3	89.0	129.0	122.0	108.0	110.0
60	LRB062	90.0	99.9	44.0	69.0	56.0	46.0	93.0	70.0	66.9	68.3	129.0	138.4	80.0	112.0	118.1	93.0	96.3	89.0	137.0	125.0	109.3	112.6
61	LRB063	86.0	79.9	44.0	57.0	63.0	43.0	82.0	66.0	63.0	62.1	125.0	120.1	80.0	104.0	107.1	99.0	98.6	91.0	123.0	125.0	106.7	106.4

S. No.	Accession No.	Plant height (cm)												No. of primary branches																	
		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.
41	LRB037	58.3	60.1	30.3	87.5	129.0	127.3	72.6	71.1	126.2	96.0	85.7	85.5	2.2	2.3	1.8	2.0	3.0	3.2	3.3	3.0	3.4	2.5	2.6							
42	LRB040-1	59.2	61.0		84.0	131.0	129.3	74.4	72.9	144.6	70.0	93.9	93.6	2.5	2.5		3.5	3.0	3.0	3.1	4.0	4.4	3.2	3.3							
43	LRB042	57.6	59.4	28.8	87.5	128.0	126.3	72.8	71.3	154.0	65.0	84.8	84.6	2.2	2.2	1.8	2.2	4.0	3.6	3.7	3.4	3.8	2.9	2.9							
44	LRB043	55.6	57.4	51.4	89.5	119.0	117.3	75.0	73.5	127.2	92.0	87.1	86.9	2.2	2.2	1.2	2.2	4.0	3.4	3.5	3.8	4.2	2.8	2.9							
45	LRB044	59.2	61.0	46.5	88.0	133.0	131.3	53.0	51.5	159.4	86.0	89.3	89.1	2.2	2.3	1.4	3.0	5.0	3.4	3.5	5.2	5.6	3.4	3.5							
46	LRB045	55.5	57.3	45.1	94.5	127.0	125.3	64.8	66.2	110.2	102.0	85.6	85.8	3.2	3.2	1.6	3.5	4.0	3.2	3.1	4.4	4.8	3.3	3.4							
47	LRB046	55.7	57.5	32.6	86.5	135.0	133.3	58.4	59.8	166.4	83.0	88.2	88.4	2.6	2.6	1.7	2.5	5.0	2.8	2.7	3.8	4.2	3.1	3.1							
48	LRB047	58.3	60.1	52.9	91.0	131.0	129.3	77.2	78.6	130.4	73.0	87.7	87.9	2.1	2.2	1.3	3.0	4.0	4.8	4.7	4.8	5.2	3.3	3.4							
49	LRB048	59.1	60.9	36.0	92.2	132.0	130.3	74.6	76.0	127.4	100.0	88.8	89.0	2.3	2.4	1.4	4.0	3.0	4.2	4.1	5.2	5.6	3.4	3.4							
50	LRB049	62.2	64.0	31.3	85.5	148.0	146.3	45.4	46.8	143.4	111.0	89.5	89.8	2.2	2.3	1.7	2.0	3.0	2.0	1.9	4.0	4.4	2.5	2.5							
51	LRB050	68.7	75.2	61.8	88.5	145.0	136.6	49.8	51.2	149.0	137.0	100.0	99.9	2.2	2.3	1.5	4.0	5.0	1.8	1.7	3.2	2.6	2.9	2.9							
52	LRB051	74.1	80.5	57.1	114.0	135.0	126.6	40.0	41.4	108.2	123.0	93.1	93.0	2.3	2.5	1.9	3.0	4.0	2.8	2.7	5.2	4.6	3.2	3.1							
53	LRB052	76.2	82.7	42.1	100.5	134.0	125.6	42.2	43.6	154.2	119.0	95.5	95.4	4.2	4.4	1.5	3.5	5.0	1.6	1.5	6.4	5.8	3.7	3.6							
54	LRB053	62.1	68.5	66.5	92.5	148.0	139.6	46.2	47.6	128.2	104.0	92.5	92.4	2.3	2.4	1.3	4.0	4.0	1.6	1.5	5.6	5.0	3.1	3.0							
55	LRB054	66.2	72.7	50.5	110.0	144.0	135.6	36.4	37.8	122.2	98.0	89.6	89.5	1.9	2.1	1.3	3.0	4.0	1.6	1.5	5.8	5.2	2.9	2.8							
56	LRB055	63.1	69.5	38.2	100.5	147.0	138.6	33.6	35.0	121.4	97.0	85.8	85.7	1.5	1.7	1.8	3.5	5.0	1.0	0.9	4.0	3.4	2.8	2.7							
57	LRB056	57.2	63.7	28.4	98.0	135.0	126.6	36.0	37.4	113.3	89.0	79.6	79.5	2.3	2.5	1.5	2.5	5.0	1.0	0.9	5.8	5.2	3.0	2.9							
58	LRB058	58.2	64.7	43.1	92.5	129.0	120.6	27.4	28.8	135.8	113.0	85.6	85.5	2.3	2.5	2.0	4.0	4.0	1.0	0.9	4.2	3.6	2.9	2.8							
59	LRB060	59.2	65.7	36.9	96.5	147.0	138.6	25.2	26.6	110.7	93.0	81.2	81.1	2.4	2.5	1.8	2.5	4.0	1.0	0.9	5.4	4.8	2.8	2.8							
60	LRB062	62.2	68.6	63.6	112.0	147.0	138.6	26.0	27.4	139.8	112.0	94.7	94.6	2.3	2.5	1.4	2.5	5.0	1.0	0.9	6.2	5.6	3.1	3.0							
61	LRB063	59.1	57.9	50.4	97.5	135.0	135.9	48.4	51.5	108.0	104.0	86.1	86.5	2.7	1.6	1.6	3.0	5.0	2.0	1.7	7.2	7.7	3.6	3.4							

S. No.	Accession No.	Seed Yield/plant (g)								No. of pod per plant								Pod length (cm)											
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean	
		Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	
41	LRB037	0.2	0.2	0.2	6.7	7.2	50.0	14.3	12.3	2.2	14.0	31.4	31.6	69.8	28.0	29.1	29.1	9.0	8.6	8.5	8.7								
42	LRB040-1	0.3	0.3		4.9	5.5	48.0	17.7	14.0		25.5	20.4	20.6	61.4	30.0	34.3	34.4	9.5	10.2	8.6	9.4								
43	LRB042	0.4	0.4	0.2	8.3	8.8	75.0	21.0	19.1	4.5	13.0	35.0	35.2	82.2	30.0	32.9	33.0	6.0	8.9	8.0	7.6								
44	LRB043	0.3	0.3	1.4	8.4	8.9	95.0	26.3	21.1	8.8	20.0	43.2	43.4	61.8	28.0	32.4	32.4	8.0	10.3	9.1	9.1								
45	LRB044	0.5	0.5	0.5	9.7	10.2	85.0	23.9	26.8	6.0	23.0	32.6	32.8	76.8	35.0	34.7	34.7	7.5	9.8	9.6	9.0								
46	LRB045	0.5	0.5	0.6	8.8	8.1	50.0	15.0	23.5	2.9	13.5	28.2	28.4	59.2	34.0	27.6	27.6	8.0	7.7	8.9	8.2								
47	LRB046	0.7	0.6	0.4	6.7	6.1	70.0	19.4	14.3	3.1	18.5	23.0	23.2	74.8	38.0	31.5	31.5	7.0	10.2	9.1	8.8								
48	LRB047	0.6	0.6	0.9	10.0	9.3	70.0	20.4	20.1	12.0	18.0	39.2	39.4	68.2	40.0	35.5	35.5	9.0	7.6	8.7	8.4								
49	LRB048	0.2	0.2	0.3	8.4	7.7	68.0	19.2	19.7	2.1	26.5	31.8	32.0	52.4	36.0	29.8	29.8	7.5	9.5	9.1	8.7								
50	LRB049	0.5	0.5	0.2	5.2	4.6	50.0	14.0	18.3	1.8	16.0	16.8	17.0	35.0	34.0	20.7	20.8	8.5	10.0	7.8	8.8								
51	LRB050	0.7	1.0	1.1	6.3	5.7	60.0	17.0	14.2	9.3	22.0	17.6	17.8	76.6	42.0	33.5	33.5	9.0	9.1	9.9	9.3								
52	LRB051	0.5	0.8	0.3	7.6	6.9	65.0	18.3	17.2	3.5	16.5	35.8	36.0	92.2	39.0	37.4	37.4	7.5	8.3	7.8	7.9								
53	LRB052	1.6	2.0	0.2	4.8	4.1	60.0	16.7	17.8	3.7	12.0	13.0	13.2	102.2	44.0	35.0	35.0	7.5	7.7	8.7	8.0								
54	LRB053	0.6	0.9	2.5	6.6	6.0	58.0	16.9	16.8	22.9	22.5	18.8	19.0	112.4	40.0	43.3	43.4	6.5	8.8	7.8	7.7								
55	LRB054	0.6	0.9	1.3	5.7	5.1	35.0	10.7	16.6	11.0	18.0	19.6	19.8	68.2	39.0	31.2	31.2	7.5	8.3	7.9	7.9								
56	LRB055	0.2	0.5	1.1	4.2	3.5	45.0	12.6	10.1	9.5	16.0	16.4	16.6	68.2	44.0	30.8	30.9	7.5	8.8	7.7	8.0								
57	LRB056	0.2	0.5	0.2	4.0	3.3	40.0	11.1	12.5	2.2	18.0	13.4	13.6	68.8	45.0	29.5	29.5	8.0	9.0	8.5	8.5								
58	LRB058	0.4	0.7	0.6	3.9	3.3	35.0	10.0	11.1	6.5	22.5	13.0	13.2	63.6	40.0	29.1	29.2	6.5	8.2	7.8	7.5								
59	LRB060	1.4	1.7	0.2	3.3	2.7	60.0	16.2	10.0	1.6	22.0	10.6	10.8	72.0	42.0	29.6	29.7	7.5	8.0	6.8	7.4								
60	LRB062	0.2	0.5	2.9	2.7	2.1	58.0	16.0	15.7	27.6	14.5	8.8	9.0	90.2	41.0	36.4	36.5	8.5	7.3	6.9	7.6								
61	LRB063	0.5	1.0	4.8	5.2	4.8	40.0	12.6	16.7	39.3	21.5	13.6	12.0	6.8	44.0	25.0	24.7	6.5	8.6	7.3	7.5								

S. No.	Accession No.	Seeds per pod						100 seed wt (g)										
		Ranchi		Bhubneshwar		Delhi	Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean	
		Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.
41	LRB037	7.5	5.4	5.6	7.2	6.4	6.8	6.8	6.8	5.5	7.1	6.9	6.0	6.2	6.3	6.4	6.3	
42	LRB040-1	7.0	4.7	4.9	9.8	6.6	7.2	6.8	6.8	5.6	6.8	6.7	5.0	5.2	7.1	6.4	6.3	
43	LRB042	4.0	6.4	6.6	7.8	6.2	6.1	5.1	5.1	5.4	6.9	6.8	4.5	4.7	7.2	5.7	5.8	
44	LRB043	6.5	5.3	5.5	10.0	6.8	7.3	5.9	5.9	5.4	7.4	7.3	6.0	6.2	7.2	6.3	6.4	
45	LRB044	6.0	7.3	7.5	10.0	7.7	7.8	5.8	5.8	5.4	6.2	6.1	5.5	5.7	6.6	5.9	5.9	
46	LRB045	8.0	6.5	6.4	18.0	9.7	10.8	5.8	5.8	5.3	6.1	5.6	6.5	6.7	7.0	6.1	6.1	
47	LRB046	5.5	6.1	6.0	9.0	6.7	6.8	5.7	5.7	5.4	6.9	6.4	6.5	6.7	7.1	6.2	6.2	
48	LRB047	8.0	5.1	5.0	7.0	6.3	6.7	6.8	6.8	5.1	6.6	6.1	5.3	5.4	5.8	6.1	5.8	
49	LRB048	6.5	5.8	5.7	9.0	6.8	7.1	6.4	6.4	5.4	6.7	6.2	5.5	5.7	7.3	6.3	6.2	
50	LRB049	8.0	4.9	4.8	10.0	6.9	7.6	5.9	5.9	5.6	7.9	7.4	5.0	5.2	8.4	6.4	6.5	
51	LRB050	6.5	6.5	6.4	9.2	7.2	7.4	6.4	6.4	5.3	7.6	7.1	4.0	4.2	7.9	6.3	6.2	
52	LRB051	6.0	5.7	5.6	7.8	6.3	6.5	6.4	6.4	5.1	6.0	5.5	5.0	5.2	7.9	6.1	6.0	
53	LRB052	7.0	6.4	6.3	8.0	6.9	7.1	6.2	6.2	5.4	6.1	5.6	5.0	5.2	7.3	6.0	5.9	
54	LRB053	5.5	7.1	7.0	8.0	6.9	6.8	7.1	7.2	5.4	5.8	5.3	5.5	5.7	7.4	6.4	6.2	
55	LRB054	6.0	6.4	6.3	7.8	6.6	6.7	6.7	6.7	5.3	6.5	6.0	5.5	5.7	7.7	6.4	6.3	
56	LRB055	7.0	4.6	4.5	8.2	6.1	6.6	6.5	6.5	5.0	7.3	6.8	6.0	6.2	7.5	6.5	6.4	
57	LRB056	7.0	7.2	7.1	9.2	7.6	7.8	6.2	6.2	5.4	5.8	5.3	6.0	6.2	6.8	6.1	6.0	
58	LRB058	5.5	6.3	6.2	7.8	6.5	6.5	6.5	6.5	5.3	5.7	5.2	5.0	5.2	6.6	5.9	5.8	
59	LRB060	7.0	5.6	5.5	7.6	6.4	6.7	6.0	6.0	5.5	5.5	5.0	6.0	6.2	6.6	5.9	5.9	
60	LRB062	6.5	6.0	5.9	7.2	6.4	6.5	6.3	6.4	5.5	5.3	4.8	5.5	5.7	6.4	5.9	5.7	
61	LRB063	6.5	6.5	6.8	7.8	6.9	7.0	6.4	6.3	5.4	5.8	5.6	4.5	3.9	7.5	6.0	5.7	

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	udhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
41	LRB037	55.0	23.0	85.0	54.3	8.3	7.4	7.1	8.2	15.6	22.1	13.3	13.3	12.0	13.1	4.2	4.2
42	LRB040-1	56.0	28.0	85.0	56.3	9.2	8.2	3.8	4.9	20.0	29.2	15.5	15.6	10.4	11.5	3.6	5.0
43	LRB042	57.0	24.0	75.0	52.0	10.6	9.6	11.3	12.4	16.1	21.7	14.9	14.9	13.4	14.5	4.4	4.7
44	LRB043	50.0	29.0	85.0	54.7	6.7	5.7	13.5	14.5	21.7	25.4	16.8	16.8	16.2	17.3	4.2	6.0
45	LRB044	55.0	33.0	85.0	57.7	7.8	6.8	10.6	11.6	16.7	27.5	15.6	15.7	12.2	13.3	3.4	3.7
46	LRB045	54.0	36.0	85.0	58.3	7.8	6.8	8.3	7.8	17.8	25.0	14.7	14.3	13.8	13.0	3.0	3.0
47	LRB046	65.0	31.0	85.0	60.3	10.6	9.6	8.7	8.2	25.0	20.4	16.2	15.8	13.2	12.4	4.0	5.2
48	LRB047	57.0	29.0	85.0	57.0	10.6	9.6	11.0	10.5	18.6	21.3	15.3	15.0	18.0	17.2	4.4	3.7
49	LRB048	55.0	35.0	85.0	58.3	6.1	5.2	9.2	8.7	16.7	13.3	11.3	11.0	15.8	15.0	3.6	5.2
50	LRB049	54.0	30.0	85.0	56.3	7.8	6.8	4.8	4.3	10.3	17.9	10.2	9.8	8.4	7.6	3.0	4.2
51	LRB050	53.0	49.0	85.0	62.3	8.9	9.5	5.4	4.9	13.1	14.2	10.4	10.4	10.4	9.6	4.2	3.5
52	LRB051	51.0	24.0	85.0	53.3	8.1	8.7	11.2	10.7	11.7	13.8	11.2	11.2	12.4	11.6	4.0	4.0
53	LRB052	52.0	32.0	85.0	56.3	9.4	10.0	7.5	7.0	12.8	19.6	12.3	12.3	7.2	6.4	5.2	6.0
54	LRB053	54.0	20.0	85.0	53.0	7.2	7.8	8.1	7.6	13.3	13.8	10.6	10.6	10.4	9.6	3.0	4.5
55	LRB054	52.0	24.0	85.0	53.7	7.8	8.4	6.9	6.4	9.2	20.0	11.0	11.0	9.2	8.4	4.4	3.2
56	LRB055	51.0	30.0	80.0	53.7	7.8	8.4	6.5	6.0	8.1	20.8	10.8	10.8	6.6	5.8	2.8	4.5
57	LRB056	58.0	25.0	85.0	56.0	11.7	12.3	6.5	6.0	8.3	27.5	13.5	13.5	7.4	6.6	4.4	3.7
58	LRB058	56.0	29.0	85.0	56.7	10.6	11.1	6.7	6.2	5.6	16.7	9.9	9.9	6.2	5.4	3.5	4.5
59	LRB060	57.0	30.0	85.0	57.3	13.9	14.5	4.6	4.1	7.5	21.7	11.9	11.9	5.8	5.0	4.4	4.2
60	LRB062	55.0	27.0	85.0	55.7	11.1	11.7	3.5	3.0	8.9	25.8	12.3	12.3	4.8	4.0	4.2	3.2
61	LRB063	57.0	21.0	85.0	54.3	16.1	16.8	6.7	6.3	6.1	21.3	12.5	12.6	8.2	9.1	4.0	3.0

S. No.	Accession No.	Days to 50% flowering										Days to maturity											
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean			
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	
62	LRB065	86.0	79.9	44.0	55.0	65.0	43.0	79.0	66.0	62.6	61.7	124.0	119.1	80.0	104.0	107.1	98.0	97.6	98.0	124.0	125.0	107.6	107.3
63	LRB066	90.0	83.9	45.0	58.0	63.0	46.0	85.0	65.0	64.6	63.7	128.0	123.1	88.0	103.0	106.1	99.0	98.6	98.0	126.0	125.0	109.6	108.1
64	LRB067	90.0	83.9	45.0	53.0	50.0	43.0	82.0	64.0	61.0	60.1	128.0	123.1	89.0	102.0	105.1	86.0	85.6	98.0	125.0	123.0	107.3	106.8
65	LRB068	87.0	80.9	44.0	63.0	56.0	46.0	85.0	66.0	63.9	63.0	123.0	118.1	87.0	108.0	111.1	92.0	91.6	99.0	135.0	125.0	109.9	109.8
66	LRB071-1	90.0	83.9		60.0	58.0	46.0	89.0	65.0	68.0	67.0	124.0	119.1		117.0	120.1	95.0	94.6	101.0	134.0	125.0	116.0	111.6
67	LRB071-2	90.0	83.9		53.0	62.0	46.0	89.0	66.0	67.7	66.6	131.0	126.1		110.0	113.1	68.0	67.6	101.0	133.0	125.0	111.3	111.0
68	LRB072-2	92.0	85.9		64.0	57.0	43.0	82.0	67.0	67.5	66.5	136.0	131.1		114.0	117.1	87.0	86.6	101.0	136.0	123.0	116.2	115.8
69	LRB073-1	97.0	90.9		65.0	65.0	46.0	93.0	67.0	72.2	71.1	140.0	135.1		118.0	121.1	98.0	97.6	101.0	135.0	123.0	119.2	118.8
70	LRB074-1	99.0	92.9		59.0	61.0	43.0	93.0	65.0	70.0	69.0	142.0	137.1		117.0	120.1	67.0	66.6	101.0	137.0	123.0	114.5	114.1
71	LRB074-2	92.0	89.2		44.0	59.0	43.0	75.0	59.0	62.0	61.5	129.0	127.4		119.0	122.1	96.0	94.0	101.0	130.0	120.0	115.8	115.8
72	LRB074-3	92.0	89.2		64.0	59.0	46.0	79.0	64.0	67.3	66.9	126.0	124.4		118.0	121.1	96.0	94.0	101.0	134.0	120.0	115.8	115.8
73	LRB075-1	92.0	89.2		53.0	63.0	46.0	82.0	60.0	66.0	65.5	127.0	125.4		117.0	116.1	98.0	96.0	101.0	133.0	121.0	116.2	115.4
74	LRB077	92.0	89.2	45.0	56.0	62.0	46.0	75.0	60.0	62.3	61.9	127.0	125.4	80.0	116.0	115.1	97.0	95.0	101.0	135.0	123.0	111.3	115.8
75	LRB078	90.0	87.2	45.0	45.0	58.0	43.0	82.0	60.0	60.4	60.0	122.0	120.4	79.0	120.0	119.1	95.0	93.0	101.0	125.0	123.0	109.3	108.8
76	LRB079	100.0	97.2	43.0	51.0	68.0	43.0	90.0	63.0	65.4	65.0	146.0	144.4	80.0	114.0	113.1	97.0	95.0	97.0	133.0	121.0	112.6	111.8
77	LRB080	97.0	94.2	45.0	53.0	58.0	43.0	82.0	65.0	63.3	62.9	137.0	135.4	81.0	111.0	110.1	95.0	93.0	97.0	131.0	121.0	110.4	109.6
78	LRB081	91.0	88.2	43.0	55.0	59.0	43.0	89.0	65.0	63.6	63.2	128.0	126.4	84.0	105.0	104.1	96.0	94.0	97.0	136.0	122.0	109.7	108.6
79	LRB085	101.0	98.2	46.0	43.0	58.0	43.0	89.0	63.0	63.3	62.9	147.0	145.4	80.0	96.0	95.1	95.0	93.0	102.0	131.0	125.0	110.9	110.8
80	LRB087	92.0	89.2	44.0	52.0	52.0	43.0	82.0	63.0	61.1	60.7	124.0	122.4	80.0	103.0	102.1	88.0	86.0	102.0	131.0	125.0	107.6	106.9
81	LRB089	95.0	92.2	44.0	64.0	52.0	43.0	75.0	66.0	62.7	62.3	131.0	126.8	81.0	108.0	107.1	88.0	84.0	102.0	134.0	125.0	109.9	108.4

S. No.	Accession No.	Plant height (cm)												No. of primary branches																	
		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.
62	LRB065	61.3	60.0	36.0	94.5	145.0	145.9	59.4	62.5	133.8	112.0	91.7	92.1	4.3	3.2	1.4	2.0	4.0	3.6	3.3	7.0	7.5	3.7	3.6							
63	LRB066	68.2	67.0	45.2	88.0	149.0	149.9	57.2	60.3	149.2	98.0	93.5	94.0	4.4	3.3	1.7	2.0	5.0	2.4	2.1	6.2	6.7	3.6	3.5							
64	LRB067	57.2	56.0	51.8	92.0	140.0	140.9	57.0	60.1	115.6	116.0	89.9	90.3	2.7	1.6	1.6	4.5	4.0	2.4	2.1	6.8	7.3	3.7	3.5							
65	LRB068	62.2	61.0	34.1	80.0	36.0	36.9	60.2	63.3	129.2	95.0	71.0	71.4	2.3	1.2	1.6	4.0	4.0	3.0	2.7	3.8	4.3	3.1	3.0							
66	LRB071-1	68.9	67.6		111.5	140.0	140.9	69.4	72.5	154.8	107.0	108.6	109.1	3.2	2.1		2.5	5.0	3.0	2.7	2.6	3.1	3.3	3.1							
67	LRB071-2	58.1	56.9		104.5	143.0	143.9	68.2	71.3	120.0	135.0	104.8	105.3	2.2	1.1		3.0	5.0	2.8	2.5	4.4	4.9	3.5	3.3							
68	LRB072-2	63.8	62.6		78.5	148.0	148.9	60.6	63.7	142.4	115.0	101.4	101.9	3.2	2.1		2.5	5.0	2.4	2.1	4.8	5.3	3.6	3.4							
69	LRB073-1	59.3	58.1		112.5	144.0	144.9	73.2	76.3	162.8	105.0	109.5	109.9	2.1	1.0		3.5	4.0	4.0	3.7	5.6	6.1	3.8	3.7							
70	LRB074-1	61.6	60.3		94.5	134.0	134.9	65.4	68.5	170.0	88.0	102.2	102.7	2.1	1.0		2.0	4.0	4.4	4.1	5.8	6.3	3.7	3.5							
71	LRB074-2	74.1	66.4		90.0	135.0	136.9	64.4	67.5	160.0	85.0	101.4	101.0	2.2	1.8		3.5	4.0	3.0	2.7	5.8	5.7	3.7	3.5							
72	LRB074-3	62.2	54.5		74.5	145.0	146.9	66.8	69.9	140.4	73.0	93.6	93.2	2.6	2.2		2.5	5.0	3.6	3.3	5.8	5.7	3.9	3.7							
73	LRB075-1	63.2	55.5		109.5	137.0	138.9	60.4	63.5	129.2	86.0	97.5	97.1	3.3	2.8		4.5	4.0	4.0	3.7	4.6	4.5	4.1	3.9							
74	LRB077	58.2	50.5	54.0	103.0	139.0	140.9	63.0	66.1	165.0	92.0	96.3	95.9	3.2	2.8	1.2	3.0	4.0	3.2	2.9	4.6	4.5	3.2	3.1							
75	LRB078	62.1	54.5	42.6	86.5	143.0	144.9	58.2	61.3	119.0	91.0	86.1	85.7	2.2	1.7	1.2	4.0	4.0	2.6	2.3	5.0	4.9	3.2	3.0							
76	LRB079	63.2	55.5	46.4	96.0	132.0	133.9	57.4	56.0	147.5	90.0	90.4	89.3	2.2	1.8	1.7	4.0	4.0	4.2	4.2	5.0	4.9	3.5	3.4							
77	LRB080	62.2	54.5	45.9	86.0	126.0	127.9	48.8	47.4	133.0	121.0	89.0	88.0	2.1	1.7	2.0	2.0	4.0	3.6	3.6	4.2	4.1	3.0	2.9							
78	LRB081	58.1	50.4	28.6	117.0	130.0	131.9	51.3	49.9	145.8	92.0	89.0	88.0	2.2	1.8	1.6	3.0	5.0	2.7	2.7	5.8	5.7	3.4	3.3							
79	LRB085	57.2	49.5	47.5	87.0	140.0	141.9	62.2	60.8	130.0	105.0	89.8	88.8	2.2	1.8	1.7	3.0	5.0	3.0	3.0	3.8	3.7	3.1	3.0							
80	LRB087	59.2	51.5	44.0	85.0	138.0	139.9	46.4	45.0	144.6	108.0	89.3	88.3	3.2	2.8	1.3	3.0	5.0	2.4	2.4	4.2	4.1	3.2	3.1							
81	LRB089	68.2	73.7	55.6	92.0	139.0	141.3	47.6	46.2	133.8	144.0	97.2	98.1	2.2	2.6	1.7	3.0	4.0	2.0	2.0	3.4	3.8	2.7	2.9							

S. No.	Accession No.	Seed Yield/plant (g)									No. of pod per plant							Pod length (cm)											
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean	
		Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	
62	LRB065	1.2	1.7	1.3	8.1	7.8	65.0	18.9	13.5	7.5	12.5	38.8	37.2	65.4	43.0	33.4	33.1	7.0	7.6	8.2	7.6								
63	LRB066	2.0	2.5	0.4	7.7	7.3	60.0	17.5	19.0	7.6	10.0	31.6	30.0	65.8	43.0	31.6	31.3	7.5	8.1	8.5	8.0								
64	LRB067	0.6	1.1	0.9	9.1	8.8	60.0	17.7	17.6	9.5	32.0	30.0	28.4	74.6	41.0	37.4	37.1	8.5	8.5	8.4	8.5								
65	LRB068	1.1	1.6	0.7	9.9	9.6	90.0	25.4	18.0	5.3	19.5	32.8	31.2	69.4	39.0	33.2	32.9	8.0	10.2	8.4	8.9								
66	LRB071-1	2.1	2.6		6.3	6.0	88.0	32.1	24.8		14.5	28.0	26.4	58.4	41.0	35.5	35.1	9.5	8.4	8.6	8.8								
67	LRB071-2	0.6	1.1		4.9	4.5	80.0	28.5	31.2		16.0	30.0	28.4	88.4	46.0	45.1	44.7	9.0	9.5	8.8	9.1								
68	LRB072-2	0.9	1.4		6.7	6.4	68.0	25.2	29.3		20.0	25.0	23.4	69.4	42.0	39.1	38.7	8.0	10.1	8.5	8.9								
69	LRB073-1	0.4	0.9		8.7	8.4	40.0	16.4	25.8		17.5	35.6	34.0	81.2	38.0	43.1	42.7	9.0	7.7	9.0	8.6								
70	LRB074-1	0.7	1.2		7.7	7.3	65.0	24.4	16.2		18.0	30.2	28.6	89.4	40.0	44.4	44.0	8.5	9.4	9.4	9.1								
71	LRB074-2	1.2	0.3		9.1	8.7	60.0	23.4	24.7		26.5	37.8	36.2	77.6	40.0	45.5	45.1	7.5	10.0	8.4	8.6								
72	LRB074-3	0.6	-0.3		7.6	7.2	50.0	19.4	22.3		13.5	23.6	22.0	91.2	46.0	43.6	43.2	7.2	7.8	8.6	7.9								
73	LRB075-1	0.6	-0.3		7.5	7.2	60.0	22.7	19.0		23.5	29.8	28.2	75.4	39.0	41.9	41.5	6.5	9.0	7.5	7.7								
74	LRB077	0.2	-0.7	0.7	11.8	11.5	55.0	16.9	23.6	3.8	26.5	29.6	28.0	87.2	36.0	36.6	36.3	9.0	9.3	8.5	8.9								
75	LRB078	0.7	-0.2	1.2	5.0	4.7	65.0	18.0	15.0	10.6	26.0	19.6	18.0	67.2	37.0	32.1	31.8	8.0	10.3	7.4	8.6								
76	LRB079	0.6	-0.3	2.0	8.6	8.2	50.0	15.3	18.5	15.5	16.0	31.0	28.8	84.6	40.0	37.4	37.0	8.5	10.8	8.3	9.2								
77	LRB080	0.6	-0.3	0.4	7.5	7.1	50.0	14.6	14.7	0.9	11.0	23.8	21.6	68.8	43.0	29.5	29.1	7.0	7.0	8.7	7.6								
78	LRB081	0.2	-0.7	0.3	8.3	7.8	65.0	18.4	14.4	1.7	16.0	24.1	21.9	64.6	45.0	30.3	29.8	7.5	8.2	8.1	7.9								
79	LRB085	0.3	-0.5	0.3	12.5	12.1	70.0	20.8	19.2	4.8	17.5	32.6	30.4	57.6	43.0	31.1	30.7	6.5	9.8	9.7	8.7								
80	LRB087	0.6	-0.3	0.9	6.6	6.2	65.0	18.3	19.1	6.7	25.5	25.8	23.6	80.4	49.0	37.5	37.0	9.0	10.4	8.5	9.3								
81	LRB089	1.0	1.5	1.1	7.1	6.7	60.0	17.3	18.5	4.7	22.0	26.2	24.0	69.4	48.0	34.1	33.6	9.0	8.8	8.1	8.6								

S. No.	Accession No.	Seeds per pod						100 seed wt (g)										
		Ranchi		Bhubneshwar		Delhi	Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean	
		Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.
62	LRB065	5.0	6.0	6.3	8.2	6.4	6.5	6.8	6.8	5.5	9.2	9.1	4.5	3.9	7.8	6.8	6.6	
63	LRB066	6.5	6.4	6.7	8.2	6.9	7.1	7.1	7.1	5.4	6.6	6.4	5.0	4.4	8.6	6.6	6.4	
64	LRB067	6.5	5.6	5.9	10.2	7.0	7.5	6.9	6.9	5.5	5.9	5.7	5.3	4.6	7.1	6.2	6.0	
65	LRB068	6.0	6.9	7.2	10.0	7.5	7.7	6.0	6.0	5.0	6.4	6.2	5.5	4.9	7.2	6.0	5.9	
66	LRB071-1	7.0	6.5	6.8	8.0	7.1	7.3	6.5	6.5	5.5	6.4	6.2	5.0	4.4	7.0	6.2	5.9	
67	LRB071-2	7.5	5.7	6.0	9.0	7.0	7.5	6.1	6.1	5.2	6.9	6.8	5.8	5.1	7.9	6.3	6.2	
68	LRB072-2	5.5	6.6	6.9	9.0	7.0	7.1	5.7	5.6	5.3	6.6	6.4	5.1	4.5	6.9	5.9	5.8	
69	LRB073-1	6.5	6.1	6.4	7.8	6.7	6.9	5.8	5.7	5.3	7.4	7.2	5.3	4.6	6.9	6.1	6.0	
70	LRB074-1	6.5	6.8	7.1	8.8	7.3	7.5	7.4	7.4	5.1	6.6	6.4	4.0	3.4	6.8	6.2	5.8	
71	LRB074-2	6.0	6.3	6.6	9.8	7.2	7.4	7.0	6.9	5.6	6.8	6.6	4.3	4.4	7.1	6.3	6.1	
72	LRB074-3	6.5	6.7	7.0	7.0	6.8	6.8	7.0	7.0	5.4	6.8	6.6	4.0	4.1	6.6	6.1	5.9	
73	LRB075-1	6.5	5.1	5.4	9.0	6.5	7.0	7.5	7.7	5.4	7.1	6.9	4.5	4.6	6.4	6.4	6.2	
74	LRB077	7.5	6.9	7.2	8.0	7.4	7.6	7.8	7.9	5.4	6.6	6.5	5.0	5.1	6.8	6.6	6.3	
75	LRB078	7.0	6.0	6.3	8.0	6.8	7.1	6.3	6.5	5.3	6.2	6.0	4.0	4.1	6.7	5.8	5.7	
76	LRB079	8.5	7.3	7.2	11.0	8.5	8.9	6.8	6.9	5.4	5.9	6.2	4.0	4.1	6.5	5.9	5.8	
77	LRB080	5.5	6.8	6.7	6.2	6.3	6.1	6.6	6.8	5.2	7.0	7.3	4.0	4.1	6.6	6.0	6.0	
78	LRB081	6.0	6.3	6.2	7.8	6.6	6.7	6.5	6.7	5.3	6.2	6.5	5.0	5.1	7.3	6.2	6.2	
79	LRB085	6.0	7.2	7.1	9.4	7.4	7.5	6.0	6.1	5.4	7.7	7.9	5.2	5.3	8.1	6.4	6.6	
80	LRB087	8.0	5.4	5.3	9.8	7.1	7.7	6.2	6.4	5.2	7.4	7.7	5.0	5.1	8.2	6.4	6.5	
81	LRB089	6.5	6.8	6.7	7.8	7.0	7.0	6.1	6.3	5.3	7.0	7.2	6.0	5.9	6.7	6.2	6.3	

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	Ludhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
62	LRB065	58.0	22.0	85.0	55.0	15.0	15.7	9.2	8.8	13.6	24.2	15.5	15.6	17.6	18.5	4.0	4.2
63	LRB066	52.0	18.0	85.0	51.7	10.5	11.2	11.3	10.9	15.6	12.5	12.5	12.5	14.6	15.5	3.8	4.2
64	LRB067	54.0	22.0	80.0	52.0	6.1	6.9	10.4	10.0	18.9	21.7	14.3	14.3	12.4	13.3	5.0	3.2
65	LRB068	51.0	24.0	85.0	53.3	5.6	6.3	11.5	11.1	29.2	17.5	15.9	16.0	13.2	14.1	4.6	5.0
66	LRB071-1	55.0	26.0	85.0	55.3	9.4	10.2	10.8	10.3	21.4	20.8	15.6	15.7	9.0	9.9	3.8	4.7
67	LRB071-2	59.0	20.0	80.0	53.0	13.9	14.6	8.7	8.2	23.6	17.1	15.8	15.9	10.6	11.5	5.4	4.5
68	LRB072-2	56.0	36.0	85.0	59.0	8.9	9.6	9.4	9.0	25.0	18.8	15.5	15.6	11.4	12.3	3.6	5.0
69	LRB073-1	54.0	37.0	85.0	58.7	7.2	8.0	11.3	10.9	32.8	21.7	18.3	18.3	13.0	13.9	3.8	5.5
70	LRB074-1	54.0	31.0	80.0	55.0	7.2	8.0	9.2	8.8	30.6	25.8	18.2	18.3	14.8	15.7	4.8	3.7
71	LRB074-2	52.0	45.0	75.0	57.3	8.4	8.3	10.4	10.0	15.0	20.0	13.4	13.3	14.0	14.9	5.4	2.0
72	LRB074-3	55.0	37.0	70.0	54.0	12.2	12.1	9.0	8.6	12.8	16.7	12.7	12.5	12.2	13.1	3.8	3.2
73	LRB075-1	50.0	42.0	80.0	57.3	7.8	7.7	12.9	12.5	10.8	27.5	14.7	14.6	14.4	15.3	3.0	3.2
74	LRB077	51.0	48.0	80.0	59.7	7.2	7.1	10.0	9.6	22.2	20.8	15.1	14.9	18.4	19.3	4.4	4.2
75	LRB078	50.0	38.0	80.0	56.0	8.3	8.2	6.7	6.3	17.2	24.6	14.2	14.1	9.4	10.3	4.0	4.7
76	LRB079	52.0	43.0	80.0	58.3	8.1	7.9	9.4	9.1	15.0	24.2	14.2	14.1	17.6	16.9	3.4	3.0
77	LRB080	57.0	50.0	80.0	62.3	9.4	9.3	11.2	10.8	13.6	31.7	16.5	16.4	13.6	12.9	5.2	4.0
78	LRB081	59.0	49.0	85.0	64.3	16.7	16.6	14.4	14.1	18.9	32.5	20.6	20.5	9.2	8.5	3.2	4.0
79	LRB085	54.0	31.0	80.0	55.0	10.5	10.3	10.2	9.9	15.8	23.3	15.0	14.8	17.2	16.5	5.6	2.7
80	LRB087	56.0	42.0	80.0	59.3	12.2	12.1	7.1	6.8	20.3	27.5	16.8	16.7	10.2	9.5	3.2	3.7
81	LRB089	57.0	43.0	80.0	60.0	10.0	10.9	5.4	5.1	13.9	22.9	13.0	13.2	10.2	9.5	4.4	4.7

S. No.	Accession No.	Days to 50% flowering										Days to maturity											
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean			
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	
82	LRB091	95.0	92.2	45.0	62.0	56.0	46.0	90.0	65.0	65.6	65.2	130.0	125.8	81.0	113.0	112.1	92.0	88.0	102.0	134.0	125.0	111.0	109.7
83	LRB092	91.0	88.2	45.0	64.0	58.0	46.0	100.0	65.0	67.0	66.6	127.0	122.8	85.0	103.0	102.1	94.0	90.0	102.0	134.0	125.0	110.0	108.1
84	LRB093	77.0	74.2	44.0	62.0	55.0	47.0	82.0	66.0	61.9	61.5	120.0	115.8	83.0	106.0	105.1	91.0	87.0	96.0	135.0	125.0	108.0	107.0
85	LRB094	90.0	87.2	41.0	57.0	56.0	47.0	87.0	65.0	63.3	62.9	126.0	121.8	88.0	105.0	105.5	92.0	88.0	96.0	135.0	125.0	109.6	107.7
86	LRB099	99.0	96.2	46.0	46.0	58.0	51.0	98.0	66.0	66.3	65.9	134.0	129.8	81.0	104.0	104.5	94.0	90.0	96.0	133.0	121.0	109.0	108.9
87	LRB100	100.0	97.2	45.0	65.0	52.0	46.0	85.0	63.0	65.1	64.7	146.0	141.8	79.0	110.0	110.5	88.0	84.0	89.0	125.0	121.0	108.3	107.5
88	LRB101	95.0	92.2	44.0	46.0	54.0	46.0	89.0	66.0	62.9	62.5	132.0	127.8	79.0	112.0	112.5	90.0	86.0	89.0	123.0	123.0	106.9	105.7
89	LRB102	87.0	84.2	42.0	54.0	55.0	46.0	72.0	63.0	59.9	59.5	123.0	118.8	80.0	112.0	112.5	91.0	87.0	89.0	124.0	125.0	106.3	105.0
90	LRB104	77.0	74.2	42.0	57.0	51.0	46.0	85.0	65.0	60.4	60.0	116.0	111.8	81.0	103.0	103.5	87.0	83.0	89.0	133.0	125.0	104.9	103.6
91	LRB107	94.0	89.9	44.0	59.0	58.0	47.0	75.0	67.0	63.4	62.8	131.0	126.8	78.0	112.0	112.5	94.0	90.3	91.0	135.0	125.0	109.4	108.8
92	LRB109	92.0	87.9	44.0	60.0	59.0	47.0	79.0	64.0	63.6	63.0	129.0	124.8	82.0	104.0	104.5	95.0	91.3	99.0	137.0	125.0	110.1	108.5
93	LRB110	90.0	85.9	42.0	56.0	58.0	48.0	82.0	66.0	63.1	62.6	122.0	117.8	79.0	107.0	107.5	94.0	90.3	98.0	134.0	125.0	108.4	107.8
94	LRB111	78.0	73.9	44.0	55.0	52.0	48.0		67.0	57.3	56.6	117.0	112.8	78.0	110.0	110.5	88.0	84.3	98.0		125.0	102.7	101.6
95	LRB114	91.0	86.9	44.0	64.0	58.0	46.0	90.0	67.0	65.7	65.1	128.0	123.8	72.0	111.0	111.5	94.0	90.3	98.0	138.0	125.0	109.4	109.2
96	LRB115	97.0	92.9	48.0	57.0	52.0	46.0	79.0	66.0	63.6	63.0	134.0	129.8	85.0	113.0	113.5	88.0	84.3	102.0	135.0	125.0	111.7	108.8
97	LRB116	92.0	87.9	44.0	56.0	56.0	46.0	75.0	64.0	61.9	61.3	126.0	121.8	77.0	97.0	97.5	92.0	88.3	102.0	122.0	121.0	105.3	105.4
98	LRB117	92.0	87.9	48.0	60.0	61.0	43.0	79.0	64.0	63.9	63.3	124.0	119.8	79.0	103.0	103.5	96.0	92.3	102.0	137.0	125.0	109.4	108.1
99	LRB118	95.0	90.9	45.0	58.0	60.0	43.0	82.0	65.0	64.0	63.4	132.0	127.8	84.0	110.0	110.5	96.0	92.3	102.0	135.0	125.0	112.0	110.2
100	LRB119	93.0	88.9	44.0	51.0	49.0	46.0	77.0	63.0	60.4	59.8	130.0	125.8	79.0	111.0	111.5	86.0	82.3	102.0	136.0	125.0	109.9	109.5
101	LRB211			42.0						42.0	42.0				80.0							80.0	79.0
102	LRB212			41.0						41.0	41.0				78.0							78.0	80.0

S. No.	Accession No.	Plant height (cm)												No. of primary branches																	
		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Ludhiana		Mean		S.K. Nagar		Bangalore		Ranchi		Rahuri		Bhubneshwar		Delhi		Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.
82	LRB091	67.6	73.0	38.7	113.5	137.0	139.3	45.2	43.8	14.2	127.0	77.6	78.5	2.2	2.6	1.7	3.0	3.0	1.8	1.8	4.6	5.0	2.7	2.9							
83	LRB092	63.2	68.7	48.9	81.5	136.0	138.3	43.0	41.6	133.2	122.0	89.7	90.6	2.2	2.6	1.8	2.0	4.0	2.0	2.0	4.0	4.4	2.7	2.8							
84	LRB093	57.8	63.3	39.3	110.5	137.0	139.3	40.8	39.4	130.2	113.0	89.8	90.7	2.3	2.8	1.9	3.5	3.0	1.0	1.0	6.8	7.2	3.1	3.2							
85	LRB094	62.1	67.5	19.0	76.0	135.0	137.3	39.8	38.4	126.2	117.0	82.2	83.1	2.9	3.4	1.5	2.0	4.0	2.6	2.6	4.6	5.0	2.9	3.1							
86	LRB099	72.1	77.6	67.9	83.5	135.0	137.3	43.0	41.6	137.8	117.0	93.8	94.7	3.1	3.6	1.4	3.0	3.0	1.0	1.0	3.8	4.2	2.6	2.7							
87	LRB100	68.1	73.6	58.5	110.0	130.0	132.3	46.6	45.2	125.0	124.0	94.6	95.5	2.2	2.6	2.3	2.5	4.0	2.0	2.0	4.6	5.0	2.9	3.1							
88	LRB101	63.1	68.6	50.5	112.0	135.0	137.3	55.8	54.4	152.0	83.0	93.1	94.0	2.1	2.6	1.4	2.0	5.0	2.8	2.8	3.8	4.2	2.9	3.0							
89	LRB102	72.1	77.5	50.5	112.0	134.0	136.3	55.8	54.4	154.4	103.0	97.4	98.3	2.3	2.8	1.3	3.5	5.0	1.6	1.6	4.6	5.0	3.1	3.2							
90	LRB104	79.2	84.6	58.0	103.0	136.0	138.3	50.0	48.6	167.0	90.0	97.6	98.5	5.2	5.6	1.8	2.0	5.0	1.8	1.8	5.8	6.2	3.6	3.7							
91	LRB107	69.1	72.2	49.9	112.0	134.0	137.3	55.6	57.8	154.8	132.0	101.1	102.3	3.6	3.8	1.9	3.0	4.0	1.8	1.8	4.4	4.7	3.1	3.2							
92	LRB109	76.1	79.2	43.5	104.0	131.0	134.3	58.0	60.2	185.4	99.0	99.6	100.8	3.9	4.1	1.7	3.5	3.0	3.6	3.6	4.0	4.3	3.3	3.4							
93	LRB110	62.1	65.2	50.3	107.0	129.0	132.3	63.0	65.2	150.0	116.0	96.8	98.0	2.1	2.3	1.4	3.5	3.0	4.2	4.2	3.8	4.1	3.0	3.1							
94	LRB111	61.6	64.7	50.0	110.0	135.0	138.3	51.4	53.6		123.0	88.5	89.9	2.2	2.4	1.6	1.5	4.0	1.6	1.6			2.2	2.2							
95	LRB114	69.2	72.3	44.7	111.0	134.0	137.3	55.6	57.8	170.0	125.0	101.4	102.6	2.6	2.8	1.1	2.5	3.0	2.6	2.6	3.6	3.9	2.6	2.7							
96	LRB115	58.2	61.3	40.1	113.0	135.0	138.3	59.6	61.8	138.0	115.0	94.1	95.4	2.2	2.4	1.5	4.0	3.0	2.2	2.2	3.2	3.5	2.7	2.8							
97	LRB116	58.1	61.2	51.8	97.0	130.0	133.3	53.4	55.6	140.8	111.0	91.7	93.0	2.2	2.4	1.3	3.8	3.0	2.4	2.4	4.0	4.3	2.8	2.9							
98	LRB117	62.2	65.3	63.0	103.0	133.0	136.3	59.4	61.6	158.2	83.0	94.5	95.8	2.7	2.9	1.6	3.0	3.0	2.2	2.2	3.0	3.3	2.6	2.7							
99	LRB118	69.2	72.3	69.6	110.0	136.0	139.3	70.2	72.4	124.2	108.0	98.2	99.4	2.2	2.4	1.5	2.0	3.0	3.2	3.2	5.4	5.7	2.9	3.0							
100	LRB119	72.1	75.2	48.0	111.0	135.0	138.3	56.0	58.2	144.0	112.0	96.9	98.1	2.2	2.4	1.4	2.0	3.0	1.8	1.8	3.6	3.9	2.3	2.4							
101	LRB211			27.5								27.5	27.5			1.5							1.5	1.5							
102	LRB212			44.6								44.6	44.6			1.8							1.8	1.8							

S. No.	Accession No.	Seed Yield/plant (g)								No. of pod per plant								Pod length (cm)											
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean	
		Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.
82	LRB091	7.3	7.8	0.4	5.6	5.2	57.0	17.6	18.5	2.9	23.5	26.6	24.4	52.4	47.0	30.5	30.0	7.5	9.6	9.0	8.7								
83	LRB092	2.4	2.8	0.3	6.2	5.7	55.0	15.9	16.5	9.1	22.5	27.4	25.2	62.2	50.0	34.2	33.8	8.0	8.1	8.6	8.2								
84	LRB093	3.7	4.1	0.3	5.1	4.7	35.0	11.0	16.0	1.9	24.5	27.0	24.8	61.6	44.0	31.8	31.4	7.0	9.7	6.5	7.7								
85	LRB094	0.8	1.2	0.2	7.5	7.0	30.0	9.6	10.9	3.6	11.0	21.0	18.8	73.2	48.0	31.4	30.9	6.5	10.3	9.7	8.8								
86	LRB099	1.1	1.5	1.3	4.9	4.4	45.0	13.0	9.0	1.1	19.5	24.6	22.4	62.6	46.0	30.8	30.3	8.0	9.5	8.9	8.8								
87	LRB100	0.7	1.2	0.8	8.4	8.0	55.0	16.2	13.9	5.4	25.5	22.6	20.4	72.0	50.0	35.1	34.7	8.0	7.7	8.1	7.9								
88	LRB101	0.7	1.1	0.3	9.8	9.3	50.0	15.2	16.6	3.9	10.0	29.2	27.0	75.6	51.0	33.9	33.5	9.0	9.2	8.7	9.0								
89	LRB102	1.2	1.7	1.4	10.9	10.4	45.0	14.6	15.6	9.9	21.0	21.2	19.0	68.0	46.0	33.2	32.8	9.5	8.7	8.3	8.8								
90	LRB104	1.4	1.8	0.8	9.6	9.2	50.0	15.4	14.3	3.7	24.0	25.2	23.0	106.2	52.0	42.2	41.8	9.0	10.1	8.7	9.3								
91	LRB107	0.6	0.5	1.8	4.8	5.1	60.0	16.8	14.1	10.1	19.0	14.2	14.6	74.0	47.0	32.9	32.9	7.8	9.4	8.4	8.5								
92	LRB109	1.1	1.0	2.0	10.2	10.5	65.0	19.6	18.3	19.0	20.0	40.0	40.4	92.6	50.0	44.3	44.4	8.2	9.0	8.0	8.4								
93	LRB110	0.4	0.3	0.7	10.4	10.8	70.0	20.4	19.5	5.7	16.0	38.8	39.2	86.2	50.0	39.3	39.4	8.0	9.9	8.4	8.8								
94	LRB111	0.3	0.2	1.2	7.1	7.5		2.9	19.6	4.8	8.5	26.2	26.6		48.0	21.9	22.0	7.5		8.2	7.9								
95	LRB114	0.2	0.2	1.0	8.2	8.5	60.0	17.4	3.3	6.9	14.0	23.6	24.0	89.0	47.0	36.1	36.2	7.5	9.3	9.2	8.7								
96	LRB115	0.2	0.1	0.3	10.4	10.8	40.0	12.7	18.0	3.7	23.0	40.8	41.2	60.8	47.0	35.1	35.1	8.5	7.9	8.8	8.4								
97	LRB116	0.3	0.2	0.3	9.4	9.7	60.0	17.5	12.6	4.4	17.0	34.6	35.0	69.2	50.0	35.0	35.1	9.5	10.2	9.7	9.8								
98	LRB117	1.0	0.9	0.9	8.0	8.4	50.0	15.0	17.4	5.1	21.5	27.0	27.4	46.2	4.9	20.9	21.0	9.5	7.0	9.3	8.6								
99	LRB118	1.7	1.6	1.7	13.9	14.2	75.0	23.1	16.7	21.0	13.0	44.0	44.4	86.2	48.0	42.4	42.5	8.5	8.4	8.7	8.5								
100	LRB119	4.4	4.3	1.1	8.4	8.8	75.0	22.2	22.5	5.4	9.5	31.2	31.6	55.6	52.0	30.7	30.8	7.5	9.4	9.1	8.7								
101	LRB211				0.3			0.3	38.0	4.4						4.4	4.4												
102	LRB212				1.5			1.5	0.3	8.2						8.2	8.2												

S. No.	Accession No.	Seeds per pod						100 seed wt (g)										
		Ranchi		Bhubneshwar		Delhi	Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean	
		Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.
82	LRB091	7.0	7.2	7.1	8.8	7.5	7.6	5.9	6.1	5.2	7.0	7.3	6.2	6.0	7.1	6.2	6.3	
83	LRB092	9.0	7.1	7.0	8.4	7.9	8.1	6.9	7.1	5.4	5.3	5.6	4.5	4.4	7.2	6.1	5.9	
84	LRB093	6.0	9.7	9.6	8.6	8.5	8.1	7.1	7.2	5.5	6.0	6.3	5.2	5.0	7.7	6.5	6.4	
85	LRB094	5.5	7.3	7.2	9.0	7.3	7.2	7.0	7.4	5.4	6.6	6.8	6.0	5.9	7.5	6.6	6.6	
86	LRB099	7.0	7.5	7.4	8.8	7.7	7.7	6.9	7.3	5.3	6.1	6.3	5.8	5.6	7.4	6.5	6.4	
87	LRB100	8.0	5.8	5.7	7.6	6.8	7.1	6.0	6.5	5.2	6.7	6.9	4.0	3.9	6.8	5.9	5.9	
88	LRB101	8.5	6.9	6.8	9.6	8.0	8.3	6.2	6.6	5.4	7.0	7.3	5.0	4.9	6.0	6.0	6.0	
89	LRB102	8.0	6.2	6.1	8.0	7.1	7.4	6.1	6.5	5.5	5.7	6.0	5.0	4.9	7.7	6.1	6.1	
90	LRB104	7.0	6.7	6.6	8.4	7.2	7.3	6.3	6.8	5.4	5.4	5.7	5.0	4.9	7.5	6.1	6.0	
91	LRB107	6.5	6.3	6.1	9.0	7.0	7.2	6.8	7.2	5.2	6.2	6.4	5.2	5.5	7.5	6.3	6.4	
92	LRB109	6.0	6.6	6.4	8.6	6.9	7.0	5.9	6.4	5.4	5.1	5.3	5.1	5.4	7.3	5.9	6.0	
93	LRB110	6.5	4.5	4.3	9.0	6.1	6.6	7.2	7.7	5.0	5.6	5.8	4.0	4.3	6.5	6.0	5.9	
94	LRB111	6.5	6.4	6.2		6.4	6.4	6.7	7.2	5.4	5.8	6.0			7.5	6.5	6.5	
95	LRB114	7.0	5.1	4.9	9.0	6.5	7.0	6.2	6.7	5.2	7.3	7.5	5.8	6.1	8.5	6.6	6.8	
96	LRB115	8.0	6.5	6.3	7.4	7.1	7.2	6.6	7.0	5.1	6.7	7.0	5.1	5.4	7.5	6.3	6.4	
97	LRB116	7.5	7.1	6.9	10.6	8.0	8.3	6.8	7.3	5.6	6.5	6.7	5.2	5.5	7.1	6.4	6.4	
98	LRB117	6.5	6.6	6.4	6.6	6.5	6.5	7.3	7.7	5.0	7.9	8.2	5.0	5.3	7.1	6.7	6.7	
99	LRB118	7.0	6.3	6.1	8.0	6.9	7.0	5.7	6.2	5.2	7.9	8.1	5.0	5.3	6.8	6.1	6.3	
100	LRB119	6.0	7.0	6.8	9.2	7.3	7.3	6.2	6.6	5.1	7.5	7.7	5.7	6.0	6.8	6.3	6.4	
101	LRB211																	
102	LRB212																	

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	udhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
82	LRB091	59.0	38.0	80.0	59.0	7.8	8.6	5.0	4.7	13.1	21.2	11.8	11.9	9.2	8.5	3.6	4.0
83	LRB092	53.0	40.0	85.0	59.3	10.5	11.3	10.8	10.5	14.2	17.1	13.1	13.3	10.2	9.5	4.2	4.0
84	LRB093	54.0	39.0	85.0	59.3	7.2	8.1	10.6	10.3	4.7	18.3	10.2	10.3	9.4	8.7	3.6	4.0
85	LRB094	52.0	50.0	85.0	62.3	7.3	8.2	7.3	7.0	6.1	21.7	10.6	10.7	12.2	11.5	3.8	4.5
86	LRB099	54.0	45.0	80.0	59.7	5.1	6.0	10.6	10.3	8.1	31.7	13.8	14.0	9.4	8.7	3.8	2.7
87	LRB100	52.0	40.0	85.0	59.0	8.9	9.7	7.5	7.2	11.1	25.0	13.1	13.3	9.6	8.9	3.2	3.7
88	LRB101	53.0	45.0	80.0	59.3	10.0	10.9	9.8	9.5	10.0	32.1	15.5	15.6	13.0	12.3	4.0	4.7
89	LRB102	55.0	33.0	85.0	57.7	9.4	10.3	8.1	7.8	7.8	32.9	14.6	14.7	8.4	7.7	3.8	4.0
90	LRB104	57.0	39.0	80.0	58.7	11.1	12.0	8.5	8.2	11.1	24.2	13.7	13.8	11.4	10.7	3.2	4.7
91	LRB107	55.0	33.0	85.0	57.7	9.2	10.0	6.7	6.0	22.8	26.7	16.3	16.4	6.0	5.1	4.8	4.7
92	LRB109	52.0	38.0	85.0	58.3	6.1	7.0	14.6	13.9	23.6	14.2	14.6	14.7	15.0	14.1	4.8	4.5
93	LRB110	54.0	27.0	85.0	55.3	7.3	8.2	13.7	13.0	19.4	21.3	15.4	15.5	15.0	14.1	3.6	5.2
94	LRB111	56.0		85.0	70.5	8.9	9.8	11.7	11.0		7.5	9.4	9.4	13.2	12.3		4.0
95	LRB114	54.0	32.0	85.0	57.0	6.1	7.0	11.2	10.5	26.1	10.0	13.3	13.4	12.6	11.7	4.4	4.2
96	LRB115	50.0	30.0	80.0	53.3	5.6	6.4	16.3	15.7	23.6	18.3	16.0	16.0	13.6	12.7	3.2	3.2
97	LRB116	53.0	28.0	75.0	52.0	5.6	6.4	11.3	10.7	13.3	21.3	12.9	12.9	14.2	13.3	4.8	4.0
98	LRB117	54.0	27.0	85.0	55.3	8.8	9.7	11.2	10.5	21.4	29.2	17.6	17.7	4.0	3.1	3.0	4.2
99	LRB118	52.0	29.0	85.0	55.3	5.6	6.4	13.5	12.8	19.4	23.3	15.4	15.5	19.4	18.5	4.8	3.7
100	LRB119	56.0	26.0	85.0	55.7	6.1	7.0	11.5	10.8	23.3	25.4	16.6	16.6	12.2	11.3	3.6	5.5
101	LRB211																
102	LRB212																

S. No.	Accession No.	Days to 50% flowering										Days to maturity																
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean								
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.							
103	LRB291			51.0							51.0	51.0										80.0				80.0	78.0	
104	LRB291			41.0							41.0	41.0											80.0				80.0	80.0
105	LRB311			46.0							46.0	46.0											80.0				80.0	80.0
106	LRB331			44.0							44.0	44.0											78.0				78.0	80.0
107	LRB351			44.0							44.0	44.0											80.0				80.0	78.0
108	LRB401			46.0							46.0	46.0											85.0				85.0	80.0
109	LRB711			45.0							45.0	45.0											79.0				79.0	85.0
110	LRB712			44.0							44.0	44.0											81.0				81.0	79.0
111	LRB722			46.0							46.0	46.0											80.0				80.0	81.0
112	LRB731			44.0							44.0	44.0											78.0				78.0	80.0
113	LRB741			45.0							45.0	45.0											80.0				80.0	78.0
114	LRB742			45.0							45.0	45.0											79.0				79.0	80.0
115	LRB743			42.0							42.0	42.0											79.0				79.0	79.0
116	LRB751			44.0							44.0	44.0											85.0				85.0	79.0
117	AKP10/27										124.0	124.0	124.0													161.0	161.0	123.0
118	DPRP006										82.0	82.0	82.0													123.0	123.0	123.0
119	DPRP032										79.0	79.0	79.0													133.0	133.0	133.0
120	DPRP062										77.0	77.0	77.0													124.0	124.0	124.0
121	DPRP063										90.0	90.0	90.0													126.0	126.0	126.0
122	IC364061										100.0	100.0	100.0													123.0	123.0	123.0

S. No.	Accession No.	Seed Yield/plant (g)								No. of pod per plant								Pod length (cm)												
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean		
		Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	
103	LRB291			1.0				1.0	1.5	10.9					10.9	10.9														
104	LRB291			1.3				1.3	1.0	4.7					4.7	4.7														
105	LRB311			0.9				0.9	1.3	6.5					6.5	6.5														
106	LRB331			0.7				0.7	0.9	6.6					6.6	6.6														
107	LRB351			0.4				0.4	0.7	1.5					1.5	1.5														
108	LRB401			0.8				0.8	0.4	8.5					8.5	8.5														
109	LRB711			0.4				0.4	0.8	6.6					6.6	6.6														
110	LRB712			0.3				0.3	0.4	2.3					2.3	2.3														
111	LRB722			0.2				0.2	0.3	1.6					1.6	1.6														
112	LRB731			0.5				0.5	0.2	2.7					2.7	2.7														
113	LRB741			0.8				0.8	0.5	8.0					8.0	8.0														
114	LRB742			1.5				1.5	0.8	5.4					5.4	5.4														
115	LRB743			0.2				0.2	1.5	3.8					3.8	3.8														
116	LRB751			2.5				2.5	0.2	23.7					23.7	23.7														
117	AKP10/27							5.0	5.0	2.5				6.0	6.0	6.0								6.4				6.4		
118	DPRP006							60.0	60.0	5.0				58.4	58.4	58.4								7.4				7.4		
119	DPRP032							55.0	55.0	60.0				87.8	87.8	87.8								7.4				7.4		
120	DPRP062							50.0	50.0	55.0				49.4	49.4	49.4								7.7				7.7		
121	DPRP063							50.0	50.0	50.0				52.8	52.8	52.8								6.3				6.3		
122	IC364061							20.0	20.0	50.0				15.2	15.2	15.2								9.6				9.6		

S. No.	Accession No.	Seeds per pod						100 seed wt (g)										
		Ranchi		Bhubneshwar		Delhi	Mean		Ranchi		Rahuri	Bhubneshwar		Delhi	Ludhiana	Mean		
		Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.
103	LRB291																	
104	LRB291																	
105	LRB311																	
106	LRB331																	
107	LRB351																	
108	LRB401																	
109	LRB711																	
110	LRB712																	
111	LRB722																	
112	LRB731																	
113	LRB741																	
114	LRB742																	
115	LRB743																	
116	LRB751																	
117	AKP10/27					7.0	7.0	7.0					4.5	4.4		4.5	4.4	
118	DPRP006					8.0	8.0	8.0					3.5	3.4		3.5	3.4	
119	DPRP032					7.6	7.6	7.6					4.5	4.4		4.5	4.4	
120	DPRP062					8.8	8.8	8.8					4.0	3.9		4.0	3.9	
121	DPRP063					7.4	7.4	7.4					4.0	3.9		4.0	3.9	
122	IC364061					9.4	9.4	9.4					6.5	6.4		6.5	6.4	

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	Ludhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
103	LRB291																
104	LRB291																
105	LRB311																
106	LRB331																
107	LRB351																
108	LRB401																
109	LRB711																
110	LRB712																
111	LRB722																
112	LRB731																
113	LRB741																
114	LRB742																
115	LRB743																
116	LRB751																
117	AKP10/27		15.0		15.0					0.8		0.8	0.8			2.4	
118	DPRP006		24.0		24.0					8.9		8.9	8.9			3.6	
119	DPRP032		28.0		28.0					19.4		19.4	19.4			4.4	
120	DPRP062		18.0		18.0					6.9		6.9	6.9			2.6	
121	DPRP063		18.0		18.0					8.9		8.9	8.9			3.0	
122	IC364061		20.0		20.0					2.8		2.8	2.8			2.4	

S. No.	Accession No.	Days to 50% flowering										Days to maturity										
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	
123	IC364065						100.0		100.0	100.0									125.0		125.0	125.0
124	IC364066						79.0		79.0	79.0									123.0		123.0	123.0
125	IC364080						90.0		90.0	90.0									112.0		112.0	112.0
126	DPRP010						82.0		82.0	82.0									127.0		127.0	127.0
127	DPRP025						77.0		77.0	77.0									123.0		123.0	123.0
128	DPRP040						86.0		86.0	86.0									126.0		126.0	126.0
129	DPRP053						79.0		79.0	79.0									127.0		127.0	127.0
130	DPRP054						90.0		90.0	90.0									133.0		133.0	133.0
131	DPRP057						85.0		85.0	85.0									129.0		129.0	129.0
132	DPRP059						85.0		85.0	85.0									133.0		133.0	133.0
133	JBT34/30						124.0		124.0	124.0									133.0		133.0	133.0
134	RSP-AKS54						85.0		85.0	85.0									124.0		124.0	124.0
135	BRB01						43.0		43.0	43.0									102.0		102.0	102.0
136	BRB02						46.0		46.0	46.0									102.0		102.0	102.0
137	BRB03						48.0		48.0	48.0									102.0		102.0	102.0
138	BRB04						48.0		48.0	48.0									102.0		102.0	102.0
139	BRB05						48.0		48.0	48.0									102.0		102.0	102.0
140	BRB06						48.0		48.0	48.0									102.0		102.0	102.0
141	BRB07						46.0		46.0	46.0									98.0		98.0	98.0
142	BRB08						48.0		48.0	48.0									98.0		98.0	98.0
143	BRB09						48.0		48.0	48.0									102.0		102.0	102.0

S. No.	Accession No.	Seed Yield/plant (g)							No. of pod per plant							Pod length (cm)						
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi	Mean	Bangalore	Ranchi	Bhubneshwar		Delhi	Rahuri	Mean	Ranchi	Delhi	Bhubneshwar	Mean		
		Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.		
123	IC364065						35.0	35.0	20.0							46.8	46.8	46.8			8.5	8.5
124	IC364066						25.0	25.0	35.0							66.0	66.0	66.0			6.3	6.3
125	IC364080						65.0	65.0	25.0							77.6	77.6	77.6			6.4	6.4
126	DPRP010						45.0	45.0	65.0							58.0	58.0	58.0			6.7	6.7
127	DPRP025						35.0	35.0	45.0							54.0	54.0	54.0			6.8	6.8
128	DPRP040						70.0	70.0	35.0							67.8	67.8	67.8			8.4	8.4
129	DPRP053						45.0	45.0	70.0							64.0	64.0	64.0			8.4	8.4
130	DPRP054						40.0	40.0	45.0							75.8	75.8	75.8			8.5	8.5
131	DPRP057						25.0	25.0	40.0							78.6	78.6	78.6			7.0	7.0
132	DPRP059						50.0	50.0	25.0							56.2	56.2	56.2			6.8	6.8
133	JBT34/30						45.0	45.0	50.0							26.0	26.0	26.0			6.5	6.5
134	RSP-AKS54						45.0	45.0	45.0							25.0	25.0	25.0			8.2	8.2
135	BRB01				11.1	11.4			11.1	28.2						31.8	32.2				8.0	8.0
136	BRB02				7.1	7.5			7.1	7.5						27.8	28.2				9.1	9.1
137	BRB03				10.9	11.2			10.9	11.2						40.4	40.8				9.8	9.8
138	BRB04				10.4	10.7			10.4	10.7						35.8	36.2				9.0	9.0
139	BRB05				9.2	9.6			9.2	9.6						33.0	33.4				8.4	8.4
140	BRB06				11.7	11.1			11.7	11.1						47.2	48.6				8.5	8.5
141	BRB07				9.3	8.8			9.3	8.8						30.8	32.2				8.4	8.4
142	BRB08				12.9	12.3			12.9	12.3						40.5	41.9				8.0	8.0
143	BRB09				9.6	9.0			9.6	9.0						37.8	39.2				8.8	8.8

S. No.	Accession No.	Seeds per pod						100 seed wt (g)												
		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean		
		Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	
123	IC364065					8.0	8.0	8.0							5.5	5.4			5.5	5.4
124	IC364066					9.4	9.4	9.4							6.0	5.9			6.0	5.9
125	IC364080					7.2	7.2	7.2							5.0	4.9			5.0	4.9
126	DPRP010					6.8	6.8	6.8							3.0	3.1			3.0	3.1
127	DPRP025					7.8	7.8	7.8							3.0	3.1			3.0	3.1
128	DPRP040					8.4	8.4	8.4							5.3	5.4			5.3	5.4
129	DPRP053					8.2	8.2	8.2							2.8	2.9			2.8	2.9
130	DPRP054					9.0	9.0	9.0							3.5	3.6			3.5	3.6
131	DPRP057					7.4	7.4	7.4							3.5	3.6			3.5	3.6
132	DPRP059					7.2	7.2	7.2							3.2	3.3			3.2	3.3
133	JBT34/30					7.0	7.0	7.0							4.3	4.4			4.3	4.4
134	RSP-AKS54					8.0	8.0	8.0							4.0	4.1			4.0	4.1
135	BRB01		7.6	7.4			7.5	7.4				6.1	6.3						6.1	6.3
136	BRB02		6.5	6.3			6.4	6.3				7.4	7.7						7.4	7.7
137	BRB03		7.9	7.7			7.8	7.7				7.3	7.6						7.3	7.6
138	BRB04		7.7	7.5			7.6	7.5				6.2	6.4						6.2	6.4
139	BRB05		7.6	7.4			7.5	7.4				6.5	6.8						6.5	6.8
140	BRB06		5.6	5.5			5.5	5.5				6.0	6.4						6.0	6.4
141	BRB07		6.2	6.1			6.1	6.1				6.1	6.5						6.1	6.5
142	BRB08		6.5	6.4			6.4	6.4				6.5	6.9						6.5	6.9
143	BRB09		6.7	6.6			6.6	6.6				5.9	6.3						5.9	6.3

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)	
		Rahuri	Delhi	Ludhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar				
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.			Obs.
123	IC364065		20.0		20.0					9.4			9.4	9.4			3.2	
124	IC364066		20.0		20.0					10.0			10.0	10.0			3.6	
125	IC364080		18.0		18.0					14.4			14.4	14.4			4.6	
126	DPRP010		24.0		24.0					10.3			10.3	10.3			3.6	
127	DPRP025		28.0		28.0					3.1			3.1	3.1			3.4	
128	DPRP040		22.0		22.0					8.9			8.9	8.9			4.4	
129	DPRP053		28.0		28.0					10.8			10.8	10.8			2.4	
130	DPRP054		35.0		35.0					15.3			15.3	15.3			3.4	
131	DPRP057		22.0		22.0					1.9			1.9	1.9			4.8	
132	DPRP059		23.0		23.0					8.1			8.1	8.1			3.4	
133	JBT34/30		35.0		35.0					2.5			2.5	2.5			3.0	
134	RSP-AKS54		19.0		19.0					10.6			10.6	10.6			3.0	
135	BRB01									13.8	13.2		13.8	13.2	13.8	12.9		
136	BRB02									10.8	10.1		10.8	10.1	12.2	11.3		
137	BRB03									13.7	13.0		13.7	13.0	14.4	13.5		
138	BRB04									9.6	8.9		9.6	8.9	15.2	14.3		
139	BRB05									13.5	12.8		13.5	12.8	14.6	13.7		
140	BRB06									16.0	15.0		16.0	15.0	14.8	14.9		
141	BRB07									13.5	12.5		13.5	12.5	15.6	15.7		
142	BRB08									14.0	13.1		14.0	13.1	19.2	19.3		
143	BRB09									13.5	12.5		13.5	12.5	15.0	15.1		

S. No.	Accession No.	Days to 50% flowering										Days to maturity									
		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean		S.K. Nagar		Bangalore	Ranchi	Rahuri	Bhubneshwar	Delhi	Ludhiana	Mean	
		Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.
144	BRB10					48.0			48.0	48.0							102.0			102.0	102.0
145	BRB11					46.0			46.0	46.0							102.0			102.0	102.0
146	BRB12					43.0			43.0	43.0							102.0			102.0	102.0
147	BRB13					43.0			43.0	43.0							98.0			98.0	98.0
148	BRB14					46.0			46.0	46.0							98.0			98.0	98.0
149	BRB15					48.0			48.0	48.0							98.0			98.0	98.0
150	BRB16					46.0			46.0	46.0							98.0			98.0	98.0
151	BRB17					43.0			43.0	43.0							98.0			98.0	98.0
152	BRB18					43.0			43.0	43.0							98.0			98.0	98.0
153	BRB19					46.0			46.0	46.0							98.0			98.0	98.0
154	BRB20					48.0			48.0	48.0							98.0			98.0	98.0
Means for check varieties																					
	RBL-6	90.7		42.0	54.8	51.0	45.5	82.8	64.4	61.6		125.9	91.0	109.8		87.5	99.1	128.8	123.0	109.3	
	RBL-35	81.0		41.0	43.1	46.9	44.6	60.7	64.5	54.5		117.8	82.0	97.9		85.6	98.0	120.9	121.0	103.3	
	RBL-50	90.9		42.0	63.0	55.7	49.8	90.9	65.8	65.4		126.6	87.0	103.8		91.8	98.5	136.0	124.6	109.8	
	Minimum	77.0		41.0	40.0	28.0	43.0	40.0	59.0	41.0		113.0	72.0	96.0		59.0	89.0	102.0	109.0	78.0	
	Maximum	101.0		51.0	83.0	68.0	51.0	124.0	70.0	124.0		147.0	91.0	120.0		99.0	102.0	161.0	126.0	161.0	
	Mean	90.8		44.5	57.6	55.7	46.4	83.2	65.0	62.8		128.1	81.1	108.6		91.5	97.8	131.0	123.5	107.8	
	CD1 (0.05)	NS		1.8	NS	NS	NS	NS	NS	13.5		NS	3.3	NS		NS	NS	NS	NS	12.4	
	CD2 (0.05)	10.6			NS	NS	NS	NS	NS			10.9		10.8		5.3	NS	NS	NS		
	CD3 (0.05)	12.3			NS	NS	NS	NS	NS			12.6		12.4		6.1	NS	NS	NS		
	CD4 (0.05)	9.1			NS	NS	NS	NS	NS			9.4		9.3		4.5	NS	NS	NS		
	CV (%)	3.9		4.1	11.0	7.5	4.5	11.7	2.7	21.5		2.9	4.0	3.3		1.9	3.3	4.3	3.0	11.5	
	Error																				

S. No.	Accession No.	Seed Yield/plant (g)								No. of pod per plant								Pod length (cm)												
		S.K. Nagar		Bangalore		Bhubneshwar		Delhi		Mean		Bangalore		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Delhi		Bhubneshwar		Mean		
		Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	
144	BRB10					17.4	16.8			17.4	16.8					42.2	43.6			42.2	43.6					8.2	8.2			
145	BRB11					9.7	9.1			9.7	9.1					29.0	30.4			29.0	30.4					8.3	8.3			
146	BRB12					8.6	8.0			8.6	8.0					29.6	31.0			29.6	31.0					8.5	8.5			
147	BRB13					6.7	6.1			6.7	6.1					35.4	36.8			35.4	36.8					8.5	8.5			
148	BRB14					10.4	9.8			10.4	9.8					43.8	45.2			43.8	45.2					8.5	8.5			
149	BRB15					15.2	14.7			15.2	14.7					44.6	46.0			44.6	46.0					9.0	9.0			
150	BRB16					8.0	7.5			8.0	7.5					27.2	28.6			27.2	28.6					7.9	7.9			
151	BRB17					7.3	6.7			7.3	6.7					31.8	33.2			31.8	33.2					7.9	7.9			
152	BRB18					8.0	7.4			8.0	7.4					28.4	29.8			28.4	29.8					9.2	9.2			
153	BRB19					10.9	10.3			10.9	10.3					44.6	46.0			44.6	46.0					9.3	9.3			
154	BRB20					15.5	14.9			15.5	14.9					21.0	22.4			21.0	22.4					8.9	8.9			
Means for check varieties																														
	RBL-6	1.2		8.3		7.2		56.4		5.6		19.3		16.1		26.8		70.4		38.9		34.3		8.1		8.6		8.6		8.4
	RBL-35	0.7		12.2		8.3		49.0		7.0		36.5		22.1		28.8		58.8		37.8		36.8		8.4		8.1		8.8		8.4
	RBL-50	1.1		11.5		8.1		44.4		6.9		39.0		19.9		27.8		63.0		38.6		37.7		8.3		8.8		8.9		8.7
	Minimum	0.2		0.0		2.7		5.0		0.2		0.9		8.5		8.8		6.0		4.9		1.5		6.0		6.1		6.5		
	Maximum	7.3		12.2		17.4		95.0		70.0		39.3		36.0		47.2		133.0		52.0		87.8		10.0		10.8		9.9		
	Mean	1.2		1.1		7.6		53.0		17.1		7.4		18.1		26.6		67.1		36.3		32.3		8.1		8.6		8.5		
	CD1 (0.05)	NS		1.8		NS		NS		12.5		7.5		NS		NS		NS		NS		14.5		NS		NS		NS		
	CD2 (0.05)	2.6				2.0		NS						NS		16.3		NS		NS				NS		NS		NS		
	CD3 (0.05)	3.0				2.3		NS						NS		18.8		NS		NS				NS		NS		NS		
	CD4 (0.05)	NS				NS		NS						NS		NS		NS		NS				NS		NS		NS		
	CV (%) Error	71.9		160.5		8.6		35.6		73.0		100.4		29.0		20.1		32.5		23.8		44.8		10.8		204.4		5.6		

S. No.	Accession No.	Seeds per pod						100 seed wt (g)													
		Ranchi		Bhubneshwar		Delhi		Mean		Ranchi		Rahuri	Bhubneshwar		Delhi		Ludhiana	Mean			
		Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.	Obs.	Adj.		
144	BRB10			8.2	8.1			8.1	8.1					7.2	7.6					7.2	7.6
145	BRB11			5.9	5.8			5.8	5.8					6.7	7.1					6.7	7.1
146	BRB12			7.3	7.2			7.2	7.2					6.2	6.5					6.2	6.5
147	BRB13			5.8	5.7			5.7	5.7					8.0	8.4					8.0	8.4
148	BRB14			5.5	5.4			5.4	5.4					5.5	5.9					5.5	5.9
149	BRB15			6.6	6.5			6.5	6.5					6.5	6.9					6.5	6.9
150	BRB16			6.2	6.1			6.1	6.1					6.5	6.9					6.5	6.9
151	BRB17			6.8	6.7			6.7	6.7					5.6	6.0					5.6	6.0
152	BRB18			6.6	6.5			6.5	6.5					6.6	7.0					6.6	7.0
153	BRB19			4.5	4.4			4.4	4.4					6.9	7.3					6.9	7.3
154	BRB20			5.0	4.9			4.9	4.9					6.7	7.1					6.7	7.1
Means for check varieties																					
	RBL-6	7.5	6.4			8.4	7.4			6.4		5.3	6.3		5.0		7.0		6.0		
	RBL-35	6.8	6.3			7.6	6.9			6.3		5.3	6.6		5.0		6.9		6.0		
	RBL-50	6.9	6.6			8.4	7.3			6.1		5.3	6.0		5.1		6.8		5.8		
	Minimum	4.0	4.0			5.0	4.4			5.1		5.0	4.2		2.8		5.5		2.8		
	Maximum	9.5	9.7			18.0	9.7			7.8		5.8	9.2		6.8		8.6		8.0		
	Mean	6.9	6.3			8.4	7.0			6.4		5.3	6.5		5.0		7.1		6.0		
	CD1 (0.05)	NS	NS			NS	0.8			0.3		NS	NS		NS		NS		0.8		
	CD2 (0.05)	NS	1.3			NS				0.8		NS	1.1		1.1		NS				
	CD3 (0.05)	NS	1.5			NS				0.9		NS	1.3		1.2		NS				
	CD4 (0.05)	NS	NS			NS				0.7		NS	1.0		NS		NS				
	CV (%) Error	14.3	6.9			13.7	11.7			4.1		4.2	5.8		7.2		9.8		14.2		

S. No.	Accession No.	Plant stand at maturity				Seed yield (q/ha)								Clusters/ plant		No. of pods per cluster (Delhi)	No. of secondary branches (Ludhiana)
		Rahuri	Delhi	Ludhiana	Mean	Rahuri		Bhubneshwar		Delhi	Ludhiana	Mean		Bhubneshwar			
		Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Adj.		
144	BRB10							17.3	16.4			17.3	16.4	18.5	18.6		
145	BRB11							9.6	8.7			9.6	8.7	11.2	11.3		
146	BRB12							11.3	10.4			11.3	10.4	13.0	13.1		
147	BRB13							11.3	10.4			11.3	10.4	11.6	11.7		
148	BRB14							14.4	13.5			14.4	13.5	22.0	22.1		
149	BRB15							15.8	14.8			15.8	14.8	18.2	18.3		
150	BRB16							9.6	8.7			9.6	8.7	13.6	13.7		
151	BRB17							9.6	8.7			9.6	8.7	17.2	17.3		
152	BRB18							11.2	10.2			11.2	10.2	14.6	14.7		
153	BRB19							14.4	13.5			14.4	13.5	22.2	22.3		
154	BRB20							6.9	6.0			6.9	6.0	21.6	21.7		
Means for check varieties																	
	RBL-6	55.4	27.4	83.1	55.3	9.9		7.5		12.6	21.7	12.9		10.2		3.8	4.1
	RBL-35	54.9	29.9	81.9	55.6	9.3		8.7		9.6	20.3	12.0		10.8		3.6	4.3
	RBL-50	54.8	29.8	80.0	54.9	9.0		9.2		15.3	14.1	11.9		11.6		3.8	3.7
	Minimum	49.0	8.0	70.0	15.0	1.1		3.5		0.8		0.8		4.0		2.3	1.3
	Maximum	65.0	59.0	85.0	70.5	17.2		17.3		35.0		20.6		22.2		5.6	7.0
	Mean	55.0	31.0	82.1	51.8	9.9		9.4		13.5		12.6		11.6		3.9	4.1
	CD1 (0.05)	NS	NS	NS	12.7	NS		NS		NS		3.3		NS		NS	NS
	CD2 (0.05)	NS	NS	NS		4.9		3.9		NS				5.6		NS	NS
	CD3 (0.05)	NS	NS	NS		5.6		4.5		NS				6.5		NS	NS
	CD4 (0.05)	NS	NS	NS		4.2		3.4		NS				4.9		NS	NS
	CV (%) Error	4.3	35.6	5.0	24.5	16.6		13.7		51.6		26.1		15.9		19.0	18.4

Table 110. Promising lines in Faba bean germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines	Highest value of best check
Hisar (Accessions 50)				
1.	Days to flowering	57-99	EC267639, EC329673, IC331587, EC243791, EC329724, IC248945, EC243608, EC243608, EC243834, EC329631, EC329662, EC329708, EC34710, IC117809, IC361497, EC243895, EC267641, EC354951, EC359685, IC347914 < (66.00 days)	Vikrant (72.0 days)
2.	Days to maturity	163-184	EC323731, IC332138, EC243624, IC331549 < (66.00 days)	Vikrant (170.0 days)
3.	Plant height (cm)	43-87	EC354985, EC117744, EC329723, EC117795, EC329605, IC331561, EC329627, HB-202, HB-504, BSH-42, EC243624, EC243631, EC32790, EC329672, EC117739, EC243761, EC329728, EC243793, EC343749, EC329724, EC243575, EC267639, IC331587 > (74.9 cm)	Vikrant (67.0 cm)
4.	Branches per plant	3-8	EC329679, EC10720, IC331549, IC361490 > (6.0)	PRT-7 (5.0)
5.	Cluster per plant	10-54	EC10720, EC108908, EC117745, IC331564, EC329680, EC117758, IC361490, EC243624, EC329728, EC243772, EC329631, EC117705, EC329643, EC117792, EC117755, EC243755, EC243529, EC10845, EC117739, IC361499, EC267640, EC243761, EC361487, EC117726, EC248945, IC348948, IC267646, EC293713, EC354985, EC243631, EC324677, EC243749 > (30.0)	PRT-7 (26.0)
6.	Pod per plant	17-94	EC10720, EC117745, IC276639, EC108908, EC243529, EC243611, EC329631, EC329728, EC329695, EC243761, EC329682, EC243860, EC329643, EC25072, EC243756, IC331564, EC329723, IC361490, EC243772, EC117755, EC329638, EC243624, EC248951, HB-518, EC361487, EC329712, EC354951, IC361485 > (49.0)	PRT-7 (42.0)
7.	Pod length (cm)	3-7	EC329682, EC3296730, EC322967, EC329713, EC243626, EC329588, IC361470, EC267639, IC331587, EC243820, IC117809 > (5.5 cm)	PRT-12 (5.0 cm)
8.	Seed per pod	2-4	EC267639, EC329680, EC329723, EC243036, IC361438, EC25192, EC117842, EC329681, EC247592, IC361426, EC329714, EC243524A, EC321003, EC329812 > (3.0)	PRT-7 (3.0)
9.	100 seed weight (g)	18-42	EC329708, EC117748, EC323731, EC248710, EC243594, EC322967, EC117795, EC329681, EC243860, EC243860, EC248952 > (34.6 g)	Vikrant (28.0 g)

S.No.	Characters	Range	Promising lines	Highest value of best check
10.	Seed yield per plant (g)	5-104	HB-516, HB-504, HB-518, BSH-9, EC243834, IC331587, HB-180, EC243575, EC10845, IC361427, EC243749, HB-193, EC329723, IC331561, EC329682, EC329003, EC243761, EC329713, EC243861, EC243588, EC5864, EC117758, EC117795, EC243820, EC243631, EC329588, EC25192, EC329679, EC359685, EC117784 > (64.0 g)	Vikrant (54.0 g)
Delhi (Accessions 50)				
1.	Days to initial flowering	37.0-99.0	EC243770, EC329605, IC361496, EC329681, EC329723, IC331564, IC361481, EC329662, IC361498, EC010845, EC248945, EC243529, EC343696, IC267647, IC361427, EC117745, EC243784, EC329680, JBT 6/89, EC359685, JPM 7, EC329677 < (41.0 days)	PRT-12 (47.5 days)
2.	Days to 50% flowering	44.0-105.0	EC329681, EC243770, IC361496, EC329723, EC329662, IC361498, EC010845, IC361481, IC331564, EC248945, EC243529, EC343696, IC267647, IC361427, JBT 36/89, EC359685, EC243784, EC329677, EC243036, EC243594 > (49.0 days)	PRT-12 (55.0 days)
3.	Days to pod set	52.0-117.0	EC329723, EC329681, IC361496, EC329662, IC361498, EC010845, IC361481, IC331564, EC243529, IC361427, EC243036, EC243594, EC329605 > (61.0)	PRT-12 (67.3 days)
4.	No. of pods	4.8-103.0	VKS 14/17, EC243808, EC374731, IC276764-2, JBT 36/89, EC329003, IC342752, EC243772, EC117755, KG 3/98, IC346272, JBT 38/144, EC359685, JBT 30/78, EC025072, EC248952, EC243531, EC117745, IC267644, EC117726, EC329662, KG 3/164, EC243529 > (74.8)	PRT-7 (66.8)
5.	Plant height (cm)	27.0-106.4	IC331887, IC331561, IC361496, EC243808, EC117755, EC247592, EC243820, IC361426, EC117784, IC361498, IC331571, EC243631, EC267641 > (91.2 cm)	PRT-7 (78.6 cm)
6.	No. of branches	2.0-10.0	MKS/TRS 1265, EC117755, VKS 14/17, IC117809, EC243584, NAZ/TA 18, IC361498, EC243531, EC024312, EC374731, EC243631, EC329003, EC117726, EC025072, EC329710, EC359685, EC117744, EC117753, EC243036, VKG 17/10, VKG 27/128, IC346272, EC329723, EC329708, IC342752, VKG 27/132, MKS/AKT 2/3 > (6.0)	PRT-7 (5.3)
7.	Pod length (cm)	4.2-12.4	IC493459, IC493453, MKS/TRS 1265, IC493454, IC493458, IC493456, IC493452, IC493451, MKS/AKT 272, IC493455, MKS/AKT 2/3, MKS/AKT 260, IC361481 > (7.5 cm)	PRT-7 (6.4 cm)

S.No.	Characters	Range	Promising lines	Highest value of best check
8.	No. of grains per pod	2.7-4.4	MKS/AKT 2/3, IC361481, EC243036, IC267640, EC329708, IC361498 > (4.0)	PRT-7 (3.7)
9.	Days to maturity	135.0-154.0	MKS/AKT 260, EC117726, EC117784, EC117755, EC329675, EC324677, EC354951, VKS-SCC 7/2, EC243860, JSSR 110 < (139.0 days)	PRT-7 (140.9 days)
10.	Seed yield (q/ha)	0.27-55.50	IC361496, EC243808, EC117755, IC331887, EC117784 > (46.62 q/ha)	PRT-7 (24.76 q/ha)
11.	100 seed weight (g)	9.8-88.9	IC493456, IC493459, IC493457, IC493453, IC493458, IC493451, IC493454, IC493455, IC493452, VKS-SCC 7/15, MKS/AKT 2/3 > (47.65 g)	PRT-12 (28.61 g)

Table 111. Multilocation evaluation of germplasm lines in faba bean at Hisar – Plains (2005)

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
1	BLMK-S-7	96	172	42.5	3	21	28	4.2	3	27.9	32.8
2	BSH-42	69	177	77	4	15	24	4.4	3	28.6	10.2
3	BSH-9	67	176	61.7	6	23	40	5.1	3	28.5	98.8
4	EC10719	88	178	58.3	5	16	27	4.8	3	30.7	12.1
5	EC10720	75	178	62	8	54	94	4.7	3	27	19
6	EC107842	73	176	66	6	17	29	5	3	28.7	31.9
7	EC10845	89	175	64.5	5	34	43	5	3	25.5	82
8	EC108908	80	168	71.3	6	50	61	4.8	3	26.5	62.2
9	EC117361	73	178	64.7	5	24	32	4.8	3	27.4	25.7
10	EC117705	84	181	69.3	5	37	49	4.6	3	30.6	52.7
11	EC117720	73	174	55.9	5	28	48	4.1	3	23.9	22.2
12	EC117724	83	179	55.7	4	17	30	5.4	3	30	41
13	EC117726	79	176	71	5	32	37	4.7	3	28	19.1
14	EC117727	76	181	70.3	4	13	17	4.8	3	32.8	52
15	EC117734	80	175	72.5	4	18	41	5.1	3	29.5	25
16	EC117739	83	174	75.8	6	33	46	3.8	3	26.5	38.5
17	EC117741	83	174	70.8	5	24	34	4.8	3	32	21.5
18	EC117744	68	174	85.2	4	30	49	4.9	3	29.1	30.9
19	EC117745	86	181	70.9	6	47	67	4.9	3	30.6	20.5
20	EC117748	73	176	70.9	5	19	30	4.5	3	39.1	17.9
21	EC117749	69	178	69.8	5	25	40	4	3	23.6	16.7
22	EC117753	79	173	72.3	5	28	35	4.9	3	31	14.5
23	EC117755	69	172	72.1	5	35	53	4.4	3	28.8	17.3

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
24	EC117758	81	177	74.6	5	38	49	5.3	3	23.7	72.5
25	EC117765	75	172	61.3	4	28	46	4.1	3	18.3	31.1
26	EC117784	71	173	71.2	5	30	49	5.4	3	30.7	65.6
27	EC117792	83	173	72	6	35	49	5.4	3	27.4	17.9
28	EC117795	67	174	80.2	5	25	35	5.5	3	36.3	72.2
29	EC117799	66	176	60.4	3	28	42	4.8	3	24.6	13.3
30	EC117818	75	175	70	6	20	35	4.4	3	33.4	29.4
31	EC117842	69	182	69.2	5	20	29	5.3	4	29.1	8.4
32	EC243036	82	174	66.2	4	26	49	5.3	4	23.9	18.4
33	EC24312	83	181	65.6	6	30	39	5.4	3	23.9	51.9
34	EC243524A	75	177	67.2	5	28	42	4.8	4	22.9	6.2
35	EC243529	79	181	69.4	5	34	61	3.1	2	33.3	55.4
36	EC243575	71	172	75.2	6	21	34	4.9	3	24.6	91
37	EC243584	80	176	60.3	4	25	34	5.4	3	30	5.3
38	EC243588	85	172	61	5	24	34	4.6	3	30.5	72.8
39	EC243594	90	169	70.6	4	15	26	3.7	3	36.5	4.7
40	EC243596	78	174	72	5	24	38	4.9	3	29.9	19.7
41	EC243608	63	172	48.9	4	23	39	4.9	3	30.2	50.1
42	EC243608	63	166	68.7	4	27	33	4.7	3	32	22.2
43	EC243611	86	169	64.8	5	30	60	4.3	3	27.1	48.4
44	EC243624	82	164	76.9	6	37	52	4.9	3	29.1	17.2
45	EC243626	71	170	68	5	25	47	5.7	3	21.1	33.8
46	EC243631	72	174	76.5	5	31	46	5.2	3	28.2	71.6
47	EC243637	86	178	63.7	5	30	37	5.2	3	25.5	29.4

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
48	EC243709	69	177	70.1	4	22	37	5.2	3	24.6	10
49	EC243743	68	175	59	4	17	32	4	3	26.4	16.6
50	EC243749	72	179	60.7	4	31	28	4.4	3	26.5	79.2
51	EC243755	86	179	63.2	6	34	44	5.2	3	29.2	15.8
52	EC243756	82	169	59	3	28	55	4.1	3	28.2	42.2
53	EC243761	75	174	75.7	6	32	57	4.9	3	24.9	75.4
54	EC243764	71	169	44	5	18	35	3.5	3	21	17.6
55	EC243766	86	175	46.8	5	26	47	4.5	3	26.4	52
56	EC243770	73	178	65.7	5	21	33	3.8	3	28.7	19
57	EC243772	70	179	66.1	6	37	53	5.3	3	33.1	17.5
58	EC243782	91	170	62	5	28	33	4.8	3	26	21.5
59	EC243784	70	172	55.5	6	14	25	4.5	3	24.8	15.1
60	EC243786	71	178	73.9	5	23	38	4.8	3	29.1	8.5
61	EC243791	59	174	64	4	15	27	5.2	3	30.4	49.2
62	EC243793	84	173	75.5	5	29	47	4.5	3	26.3	17.4
63	EC243808	68	173	60.2	4	21	35	4.8	3	28.9	9
64	EC243820	67	177	58.9	4	21	36	5.6	3	31.7	72
65	EC243834	63	173	66.7	5	20	31	4.8	3	29.3	97
66	EC243860	78	170	65.3	5	23	56	5.5	3	35.8	62.2
67	EC243860	71	177	60.1	4	26	47	5.1	3	35.8	8.3
68	EC243861	71	175	68.8	4	19	28	4.6	3	27.6	74
69	EC243895	65	179	70.7	5	20	29	4.8	3	26.7	15
70	EC247592	72	175	69.2	5	25	37	5.2	4	25.1	8.2
71	EC248710	72	171	63.2	4	17	32	4.5	3	36.6	15.1

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
72	EC248945	70	177	66.2	5	32	45	4.7	3	23.4	15.6
73	EC248951	82	166	70.5	5	26	52	3.9	3	31.9	27.7
74	EC248952	89	181	61.9	4	19	28	4.4	3	35.3	24
75	EC249947	71	172	67	5	22	38	4.4	3	32.1	13
76	EC25072	90	177	62.3	5	29	55	4.9	3	25.9	29.7
77	EC25085	90	181	74.1	4	25	35	4.7	3	29.2	42.2
78	EC25088	78	171	67	4	19	31	4.7	3	26.5	57.2
79	EC251014	67	170	63.8	4	15	24	5.1	3	33	21.7
80	EC25192	74	177	62.1	3	20	35	5.3	4	23.5	68.2
81	EC267639	57	177	75.2	5	27	44	5.6	4	28.8	4.9
82	EC267640	75	174	64.6	5	33	46	4.8	3	28.3	29.5
83	EC267641	65	174	68.2	4	18	30	4.9	3	25.2	18
84	EC267648	80	171	60	4	20	35	4.5	3	21.1	32.1
85	EC267649	71	175	60.3	5	27	49	4.5	3	31.8	9
86	EC293713	84	176	66.3	6	31	40	5	3	30.1	28.1
87	EC321003	72	175	61	3	18	26	4.8	4	28.5	31.4
88	EC322967	76	174	60.4	5	21	31	5.8	3	36.3	47
89	EC323731	75	163	54	4	18	32	5.2	3	38.9	45.1
90	EC324644	86	176	51	4	26	34	3.7	3	26.3	20.5
91	EC324677	76	179	71.7	5	31	37	4.4	3	31.1	41
92	EC32790	70	181	76.2	4	24	32	4.5	3	30	9.4
93	EC329003	73	179	50.9	4	21	34	4.8	3	28.5	75.4
94	EC329588	72	178	60.3	4	18	31	5.7	3	27	70.1
95	EC329605	86	175	79.7	5	19	24	4.7	3	25.4	61.7

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
96	EC329609	75	176	58.8	3	22	31	3.4	3	25.7	13.5
97	EC329627	80	173	78.7	4	17	29	4.5	3	34.6	30.6
98	EC329628	85	171	52.8	5	26	44	4.1	3	21.7	16.8
99	EC329631	63	179	63.3	6	37	59	4.6	3	31.2	35.4
100	EC329638	74	172	63.2	4	30	53	5.2	3	24.7	15.3
101	EC329643	71	171	54	4	37	55	4.5	3	23.1	63.4
102	EC329648	75	174	60.3	4	26	41	4.5	3	33.5	24.2
103	EC329662	63	173	59.3	4	29	42	4.2	3	24.7	35.4
104	EC329667	90	179	57.2	5	27	37	4.6	3	34.6	63.4
105	EC329670	75	179	57.9	5	17	33	3.8	3	28.1	21.5
106	EC329672	67	170	76.1	4	28	39	4.7	3	27.5	24.6
107	EC3296730	57	182	56	3	11	20	5.9	3	23	15.4
108	EC329675	69	181	56.3	6	26	38	4.9	3	27.7	12
109	EC329677	75	177	68.7	4	24	37	4.7	3	25.5	19.5
110	EC329679	75	179	65.8	8	25	37	4.6	3	33	67.4
111	EC329680	73	180	72.1	5	41	36	5.5	4	31.7	19.5
112	EC329681	73	171	73.6	4	16	27	5.3	4	35.8	27.7
113	EC329682	75	173	71.6	4	27	57	6.5	3	30.6	75.4
114	EC329683	80	176	67	3	23	29	5.1	3	26	38.2
115	EC329688	99	173	61	3	10	19	4	3	24	25.8
116	EC329691	73	171	65.7	5	21	27	4.7	3	26.9	19.4
117	EC329693	66	171	43.7	5	24	45	4.3	3	22.9	47.3
118	EC329695	71	174	63.6	5	28	58	4.9	3	26.7	25.5
119	EC329696	86	180	61.1	5	19	23	5	3	27.8	35.4

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
120	EC329700	76	181	61.8	6	19	30	5.1	3	27.8	25
121	EC329707	87	180	54.7	5	24	35	4.9	3	29.3	8.4
122	EC329708	63	171	64	5	26	36	4.5	3	42.1	28.7
123	EC329710	97	170	52.2	4	26	30	4.2	3	27.9	15.1
124	EC329712	70	177	58.3	6	30	50	4.1	3	23.4	19.5
125	EC329713	75	181	58.2	4	15	24	5.8	3	28.1	75
126	EC329714	72	176	65.6	4	23	44	4.8	4	30.4	9.2
127	EC329715	72	176	70	4	21	42	3.8	3	30.6	30.5
128	EC329723	68	168	62	6	29	54	4.7	3	23.9	76
129	EC329723	78	173	81.6	4	20	34	5.5	4	27.8	18.9
130	EC329724	59	181	75.4	3	20	27	5.5	3	27.6	18.9
131	EC329725	72	172	66	5	18	32	5	3	27	44.1
132	EC329728	73	168	75.5	6	37	58	5.2	3	26.7	20.8
133	EC329812	69	176	62.2	4	22	33	4.6	4	28.6	16.3
134	EC343696	69	171	55.1	4	26	44	5	3	23.1	19.4
135	EC343749	70	174	75.5	4	22	41	5.4	3	28	21.4
136	EC343793	86	175	70.5	5	16	26	4.50	3	29	11.5
137	EC343808	74	169	68	5	26	49	4.8	3	28.6	24.1
138	EC343855	86	179	69.2	6	19	38	4.6	3	33.2	5.8
139	EC34710	63	181	68.8	4	20	33	4.7	3	24.6	23.8
140	EC351999	88	168	62.3	6	26	30	3.8	3	32.5	28.7
141	EC354951	65	179	69.3	6	26	50	5	3	30.1	13
142	EC354984	85	175	62.1	5	19	30	3.9	3	31.2	18
143	EC354985	79	179	87.3	5	31	38	5.3	3	28.8	18.4

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
144	EC359685	65	176	74.9	3	20	31	5.4	3	32	66
145	EC361487	85	175	61.3	6	32	50	4.3	3	29.8	62.8
146	EC374731	85	174	64.9	4	16	30	4.4	3	32.7	58.3
147	EC382423	71	181	53	5	13	21	4.5	3	28.10	5.5
148	EC5864	83	169	51.6	5	27	43	3.8	3	32.9	72.7
149	EC7853	77	168	64.3	5	26	36	4.3	3	29.7	27.2
150	HB-180	89	176	55.7	5	22	36	4.7	3	28	91.8
151	HB-181	86	181	69.7	5	25	47	5.2	3	31.3	15.4
152	HB-193	70	175	68.5	5	21	36	4.6	3	25.6	77.1
153	HB-202	76	170	78.4	4	17	27	4.8	3	27.4	41.4
154	HB-303	73	174	68.8	5	20	30	4.7	3	28.8	17.4
155	HB-504	75	171	78	4	18	30	5.1	3	28.4	101
156	HB-516	69	169	68.1	5	18	26	4.8	3	31.4	104
157	HB-518	69	174	66	5	28	51	4.6	3	24.2	100.4
158	IC117809	63	172	64.1	4	18	32	5.6	3	25.3	28.7
159	IC243781	86	179	71.9	5	22	35	4.9	3	28.1	10.1
160	IC248945	60	173	56.7	4	27	33	4.6	3	23.4	21.5
161	IC267642	73	175	63.7	3	22	28	4.4	3	25.7	18.5
162	IC267643	93	181	48.6	4	20	25	4.4	3	24.2	28.5
163	IC267644	86	173	56.6	3	20	28	5.1	3	24.8	31.9
164	IC267645	88	177	55	4	10	19	4.4	3	24.1	28
165	IC267646	72	179	68.1	6	31	46	4.7	3	23.2	6.9
166	IC276639	71	173	68.6	5	29	65	4.1	3	29.4	34.5
167	IC331549	67	165	62.4	7	28	39	5.1	3	31.2	61.9

S. No.	Genotype	Days to 50% flowering	Days to Maturity	Plant height (cm)	Branches per plant	Cluster per plant	Pods per plant	Pod length (cm)	Seed per pod	100 Seed weight (g)	Seed yield per plant (g)
168	IC331561	69	181	79.1	5	29	42	4.9	3	26.2	75.9
169	IC331564	86	178	69.5	6	47	54	4.1	2	22.5	15.2
170	IC331571	70	174	52.8	5	30	41	4	3	21.2	51.1
171	IC331587	57	181	75.2	5	27	42	5.6	3	30.8	92
172	IC332102	72	184	47.3	5	10	19	4.9	3	23.1	30.1
173	IC332138	69	164	69	6	30	37	4.9	3	28.8	61.8
174	IC346272	74	168	48.7	5	26	37	5.4	3	28.1	9.5
175	IC347914	65	171	59.6	6	24	41	5.2	3	28.9	25.4
176	IC348948	82	175	58	3	32	32	5	3	34.2	29.9
177	IC361426	72	178	70.3	5	19	29	5.1	4	29	62
178	IC361427	80	175	58.3	6	26	38	4.9	3	30.20	79.2
179	IC361438	69	167	61.1	5	23	41	5.3	4	26.7	14.1
180	IC361470	74	170	67.7	5	28	47	5.6	3	30.7	25.7
181	IC361485	82	176	59.6	6	25	50	5.2	3	23.8	18.1
182	IC361490	83	173	60.7	7	37	53	4.5	3	29.8	18.1
183	IC361494	76	179	58.3	5	26	47	3.9	3	31.1	15
184	IC361496	67	181	71.2	5	27	36	4.8	3	29	21.9
185	IC361497	63	166	43.7	5	16	24	4.6	3	21.4	19.2
186	IC361498	67	181	72.4	4	16	23	4.9	3	32	16.5
187	IC361499	91	167	53.8	6	33	49	5.2	3	23.5	45.4
Means Check for varieties											
	PRT-12	73	173	63	4	24	37	5	3	25	19
	PRT-7	80	171	64	5	26	42	5	3	24	24
	VH-82-1	75	175	62	4	24	36	5	3	27	36
	Vikrant	72	170	67	5	23	38	5	3	28	54
	Minimum	57	163	43	3	10	17	3	2	18	5
	Maximum	99	184	87	8	54	94	7	4	42	104
	Mean	75	175	65	5	25	38	5	3	28	35
	SD	8	4	8	1	7	11	1	0	4	24
	CV% phenotypic	11	2	13	19	29	28	11	9	14	70

Table 112. Multilocation evaluation of germplasm lines in faba bean at Delhi – Plains (2005)

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/ pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
1	EC010719	1	2	2	2	56.0	68.0	80.0	66.8	81.2	5.4	7.3	7.4	4.0	2442.0	141.0	2664.0	27.68	
2	EC010845	1	2	2	2	37.0	45.0	58.0	62.0	62.6	5.2	6.3	6.0	3.6	1165.5	139.0	1332.0	35.50	
3	EC108908	1	2	2	5	47.0	54.0	64.0	57.4	55.2	4.6	6.4	6.8	3.6	555.0	150.0	1332.0	16.58	
4	EC117705	1	2	2	2	54.0	61.0	73.0	64.6	63.4	6.0	7.0	6.7	3.8	2886.0	146.0	2553.0	38.43	
5	EC117720	1	1	2	6	54.0	61.0	76.0	47.0	44.4	3.8	5.4	5.3	3.0	777.0	142.0	27.8	16.05	
6	EC117722	1	2	2	5	54.0	61.0	73.0	43.6	74.0	4.2	7.4	7.2	3.4	3330.0	144.0	2220.0	31.12	
7	EC117724	1	2	2	4	47.0	55.0	68.0	60.6	76.0	4.8	7.0	6.7	3.8	3496.5	142.0	4662.0	27.32	
8	EC117726	1	3	2	1	47.0	56.0	70.0	76.0	75.4	6.6	7.0	6.7	4.0	4884.0	137.0	2997.0	34.39	
9	EC117741	1	3	2	2	54.0	61.0	73.0	71.8	70.8	5.6	7.3	7.0	3.6	999.0	142.0	2442.0	38.45	
10	EC117744	1	2	3	5	47.0	54.0	64.0	41.2	89.0	6.4	6.3	6.6	3.4	3219.0	142.0	3219.0	29.29	
11	EC117745	1	3	2	2	39.0	49.0	61.0	76.0	81.9	6.0	6.7	6.5	3.8	1332.0	139.0	1443.0		
12	EC117748	1	1	2	5	47.0	55.0	65.0	10.4	46.0	2.8	5.9	6.3	3.0	333.0	145.0	222.0	16.40	
13	EC117749	1	2	1	2	49.0	56.0	68.0	34.8	66.8	3.6	5.9	5.7	3.2	1332.0	144.0	1332.0	32.68	
14	EC117753	1	3	2	5	45.0	54.0	65.0	69.0	72.8	6.4	7.5	7.3	3.6	3219.0	139.0	2220.0	41.30	
15	EC117755	1	3	2	2	47.0	55.0	68.0	84.0	101.2	7.4	6.5	6.3	3.8	3441.0	137.0	4995.0	32.31	
16	EC117758	1	2	2	1	51.0	58.0	68.0	62.8	72.0	5.8	7.1	6.9	3.6	2830.5	149.0	2997.0	35.92	
17	EC117765	1	2	1	1	47.0	55.0	70.0	58.8	74.6	4.6	6.8	6.5	3.8	3330.0	146.0	2220.0	31.50	
18	EC117784	1	3	2	4	44.0	51.0	61.0	62.2	97.4	5.8	6.6	7.0	3.8	3996.0	137.0	4884.0	41.66	
19	EC117799	1	1	1	2	44.0	51.0	66.0	35.8	43.0	3.8	4.8	4.8	3.0	333.0	139.0	27.8		
20	EC243036	1	2	2	2	41.0	48.0	58.0	63.0	67.4	6.4	7.5	7.2	4.2	1998.0	148.0	1554.0	33.00	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/ pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
21	EC024312	1	2	2	5	54.0	61.0	73.0	48.0	86.2	6.8	6.0	6.4	3.0	1776.0	147.0	3219.0	25.75	
22	EC243525-A	1	2	1	6	47.0	54.0	64.0	57.8	62.0	4.4	6.2	6.1	3.2	1110.0	149.0	555.0	23.90	
23	EC243529	1	2	2	1	37.0	47.0	58.0	75.0	65.2	5.2	7.3	7.2	3.8	1110.0	139.0	222.0	25.08	
24	EC243531	1	3	2	4	47.0	55.0	68.0	76.6	86.8	6.8	7.3	7.1	3.6	3330.0	143.0	3496.5		
25	EC243584	1	2	1	2	49.0	56.0	68.0	53.0	85.4	7.0	7.2	7.6	4.0	1998.0	152.0	2220.0	32.22	
26	EC243588	1	2	1	2	54.0	61.0	73.0	54.2	70.0	5.4	6.5	6.3	3.4	3441.0	141.0	222.0	22.38	
27	EC243594	1	2	2	2	41.0	48.0	58.0	51.0	83.4	5.8	6.5	6.9	3.6	1221.0	144.0	3441.0	28.5	
28	EC243596	1	2	3	2	54.0	61.0	73.0	43.4	70.4	3.8	7.0	7.3	3.4	888.0	147.0	1443.0	29.55	
29	EC243608	1	3	3	6	47.0	55.0	68.0	44.6	76.4	4.2	7.1	6.9	3.6	2331.0	143.0	2109.0	36.55	
30	EC243624	1	1	3	4	44.0	50.0	61.0	23.4	68.2	3.4	6.1	6.5	3.6	693.8	141.0	777.0	30.54	
31	EC243631	1	3	1	5	47.0	55.0	68.0	53.0	92.2	6.6	6.7	7.1	4.0	2886.0	146.0	3663.0	20.80	
32	EC243637	1	3	3	5	44.0	52.0	64.0	54.4	67.0	4.6	7.4	7.1	4.0	1554.0	148.0	3219.0	38.71	
33	EC243709	1	2	1	2	63.0	71.0	80.0	47.2	69.2	4.4	6.0	6.1	3.0	777.0	148.0	333.0	27.23	
34	EC243743	1	2	1	6	47.0	54.0	64.0	58.2	80.0	5.6	7.2	6.9	3.8	3330.0	141.0	2553.0	29.33	
35	EC243755	1	2	1	3	49.0	58.0	70.0	63.4	76.8	4.2	6.3	6.1	3.6	2109.0	148.0	2331.0		
36	EC243764	1	3	2	4	44.0	52.0	63.0	58.4	82.4	5.0	7.0	6.9	3.6	2109.0	146.0	4440.0	31.92	
37	EC243770	1	3	2	5	37.0	45.0	61.0	58.6	86.2	4.8	6.6	6.5	4.0	3330.0	148.0	3441.0	33.75	
38	EC243772	1	3	1	2	44.0	52.0	65.0	84.2	82.0	5.6	7.0	6.8	3.6	3219.0	146.0	3330.0	36.31	
39	EC243781	1	2	2	3	58.0	64.0	75.0	34.4	54.0	3.2	7.0	6.8	3.4	666.0	148.0	333.0	21.92	
40	EC243782	1	2	2	5	47.0	54.0	68.0	28.2	39.2	3.8	5.5	5.2	3.4	555.0	148.0	55.5	22.50	
41	EC243784	1	2	1	2	39.0	48.0	61.0	68.6	63.0	6.0	7.2	6.9	3.8	1443.0	149.0	1665.0	36.06	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/ pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
42	EC243791	1	2	2	2	47.0	54.0	64.0	43.2	59.6	4.4	7.0	7.3	3.6	1387.5	144.0	1443.0	32.32	
43	EC243791	1	3	1	4	49.0	56.0	68.0	37.2	68.2	5.2	6.3	6.2	3.6	1110.0	148.0	1887.0	21.63	
44	EC243793	1	2	2	8	58.0	66.0	78.0	53.8	65.0	5.6	6.6	6.7	4.0	1776.0	142.0	1998.0	28.18	
45	EC243808	1	3	3	1	54.0	64.0	76.0	92.8	102.6	6.0	6.4	6.5	4.0	4551.0	148.0	5106.0	31.37	
46	EC243820	1	3	1	2	63.0	69.0	80.0	70.4	98.8	5.2	6.6	6.6	3.6	1221.0	144.0	4218.0	29.84	
47	EC243860	1	2	2	4	47.0	54.0	68.0	40.6	43.6	4.2	5.7	5.8	3.0	555.0	137.0	27.8	28.08	
48	EC243865	1	1	1	5	42.0	49.0	61.0	33.6	49.6	4.6	6.0	6.3	3.6	555.0	142.0	666.0	21.09	
49	EC243895	1	2	1	1	47.0	56.0	70.0	67.6	78.2	5.6	6.4	6.5	3.2	3330.0	142.0	2997.0		
50	EC247592	1	3	2	2	54.0	61.0	73.0	47.4	100.2	5.8	6.4	6.8	3.6	4107.0	145.0	4079.3	34.60	
51	EC248945	1	1	2	2	37.0	47.0	61.0	50.2	75.8	3.8	7.1	6.8	3.8	1110.0	142.0	1998.0	28.98	
52	EC248951	1	2	2	2	47.0	55.0	68.0	50.4	65.6	5.0	6.5	6.9	3.6	1443.0	147.0	2886.0	27.58	
53	EC248952	1	2	1	5	51.0	58.0	72.0	76.8	67.6	5.4	6.4	6.3	3.8	777.0	149.0	3219.0	32.08	
54	EC250088	1	2	1	5	63.0	70.0	80.0	48.4	67.0	5.8	7.2	7.5	3.8	1221.0	144.0	1887.0	32.21	
55	EC025072	1	2	3	1	51.0	58.0	73.0	78.4	74.4	6.6	7.5	7.2	3.4	2775.0	146.0	2220.0	40.60	
56	EC251014	1	2	1	5	47.0	54.0	64.0	47.4	62.4	5.0	6.2	6.1	3.2	1221.0	146.0	1443.0	27.54	
57	EC025192	1	3	2	5	49.0	56.0	68.0	45.8	77.0	6.0	6.9	6.8	3.8	1110.0	146.0	1665.0	33.04	
58	EC267641	1	2	2	5	49.0	57.0	68.0	69.2	92.0	5.4	6.4	6.5	3.8	1443.0	146.0	4551.0	26.40	
59	EC267645	1	2	3	5	51.0	58.0	70.0	34.6	73.0	5.2	5.9	5.8	3.0	1665.0	144.0	2442.0	30.16	
60	EC267648	1	2	1	5	41.0	49.0	61.0	5.0	44.0	2.0	5.3	5.7	3.0	222.0	149.0	111.0	25.90	
61	EC293713	1	3	2	2	47.0	56.0	70.0	57.4	73.0	4.6	7.3	7.0	3.4	1665.0	149.0	2886.0	39.72	
62	EC321003	1	2	2	2	47.0	56.0	71.0	57.8	69.6	4.6	6.6	6.7	3.2	1332.0	146.0	1332.0	28.50	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
63	EC321731	1	2	2	1	54.0	61.0	76.0	40.2	50.8	3.8	5.6	5.5	3.2	693.8	144.0	27.8	18.2	
64	EC324644	1	2	1	4	47.0	55.0	68.0	16.2	42.4	4.2	5.7	5.6	3.4	1110.0	146.0	222.0	31.74	
65	EC324677	1	2	3	2	47.0	56.0	70.0	55.8	77.6	4.4	6.9	6.6	4.0	1887.0	137.0	1665.0	35.14	
66	EC032790	1	2	1	5	47.0	54.0	65.0	34.6	74.0	4.2	5.6	5.4	3.6	1665.0	149.0	1554.0	28.85	
67	EC329003	1	2	2	2	54.0	61.0	73.0	87.0	78.2	6.6	7.1	7.0	3.8	1443.0	148.0	3330.0	31.95	
68	EC329588	1	3	1	2	47.0	54.0	65.0	26.0	65.4	4.6	6.3	6.1	4.0	1332.0	142.0	1443.0	32.04	
69	EC329605	1	3	1	5	37.0	58.0	58.0	62.2	63.4	5.0	6.7	6.4	3.2	1665.0	144.0	2553.0	34.71	
70	EC329609	1	2	1	1	54.0	61.0	73.0	72.0	78.8	5.4	7.0	6.9	3.6	2664.0	141.0	2553.0	26.62	
71	EC329620	1	3	3	2	51.0	89.0	70.0	60.4	81.0	4.6	7.1	7.0	3.6	1776.0	145.0	1998.0	30.05	
72	EC329637	1	3	2	5	45.0	54.0	65.0	54.0	58.2	5.4	6.3	6.7	3.6	888.0	142.0	1332.0	24.38	
73	EC329643	1	3	1	4	47.0	55.0	68.0	64.8	73.2	6.0	6.8	6.6	3.8	1665.0	149.0	2220.0	31.39	
74	EC329662	1	3	2	2	37.0	45.0	58.0	75.2	80.6	5.2	6.6	6.4	3.4	3330.0	154.0	3330.0	38	
75	EC329667	1	3	2	4	54.0	61.0	73.0	55.8	73.8	3.8	6.7	7.0	3.6	1554.0	142.0	2997.0	33.73	
76	EC329668	1	2	2	4	51.0	58.0	70.0	8.8	34.2	2.4	5.4	5.7	2.8	444.0	141.0	55.5	12.16	
77	EC329670	1	2	3	7	56.0	64.0	76.0	53.6	65.2	5.2	6.7	6.6	3.8	888.0	146.0	1332.0	24.60	
78	EC329672	1	2	2	2	47.0	55.0	71.0	31.8	41.5	4.0	4.3	4.1	3.0	333.0	143.0	27.8	30.00	
79	EC3296730	1	3	1	2	54.0	61.0	73.0	33.6	77.6	4.2	5.9	5.8	3.2	1665.0	144.0	2775.0	30.6	
80	EC329675	1	2	3	1	54.0	64.0	76.0	67.6	81.8	5.2	6.7	6.7	3.6	2442.0	137.0	2886.0	30.11	
81	EC329677	1	2	1	1	40.0	48.0	61.0	69.4	82.4	5.8	6.4	6.3	3.8	4107.0	144.0	3885.0		
82	EC329679	1	2	2	2	44.0	51.0	61.0	45.2	74.2	4.8	5.4	5.3	3.8	1776.0	146.0	2664.0	30.64	
83	EC329680	1	3	2	6	40.0	49.0	61.0	48.8	63.0	3.8	7.1	6.9	4.0	1776.0	139.0	2109.0	23.94	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
84	EC329681	1	2	2	4	37.0	44.0	56.0	43.4	75.6	5.4	6.2	6.6	3.4	1221.0	150.0	2664.0	26.54	
85	EC329682	1	2	2	5	54.0	61.0	73.0	23.2	70.8	3.0	6.1	5.9	3.6	1776.0	146.0	1332.0	26.78	
86	EC329683	1	2	2	4	54.0	61.0	73.0	47.2	61.6	5.0	6.4	6.2	3.4	999.0	144.0	555.0	31.75	
87	EC329691	1	2	2	5	51.0	58.0	70.0	27.2	88.4	3.6	6.5	6.9	3.4	1887.0	146.0	1665.0	37.00	
88	EC329696	1	2	1	2	41.0	50.0	62.0	42.8	60.0	3.8	7.1	6.9	3.8	1665.0	141.0	2553.0	36.88	
89	EC329700	1	2	2	8	47.0	54.0	64.0	52.0	58.8	5.4	6.7	6.4	3.6	1110.0	143.0	2664.0	32.02	
90	EC329707	1	3	1	5	49.0	58.0	72.0	64.6	72.4	5.2	6.8	6.5	3.8	3330.0	141.0	3330.0	29.38	
91	EC329708	1	3	2	5	51.0	58.0	68.0	64.2	67.2	6.2	7.2	7.0	4.2	1276.5	144.0	2220.0	30.57	
92	EC329710	1	2	1	2	54.0	61.0	73.0	46.8	57.8	6.6	6.5	6.3	3.2	1665.0	148.0	1332.0	34.52	
93	EC329712	1	2	2	2	51.0	58.0	70.0	23.2	61.0	4.6	5.5	5.9	3.0	555.0	143.0	333.0		
94	EC329713	1	2	2	4	51.0	58.0	70.0	30.4	57.6	4.8	7.0	6.9	4.0	1110.0	144.0	1554.0	25.97	
95	EC329714	2	3	2	2	51.0	58.0	70.0	52.6	74.0	5.6	6.6	6.5	4.0	1665.0	149.0	2442.0	34.09	
96	EC329715	1	3	2	5	45.0	53.0	68.0	70.2	68.4	5.8	6.5	6.2	3.6	2275.5	144.0	2109.0	36.83	
97	EC329723	1	2	1	4	37.0	45.0	52.0	49.6	81.2	6.2	6.6	7.0	3.4	3441.0	146.0	3885.0	35.10	
98	EC329724	1	3	2	4	44.0	51.0	61.0	37.8	65.8	4.0	5.6	5.4	3.8	2220.0	142.0	2331.0	27.63	
99	EC329725	1	2	2	5	49.0	56.0	68.0	34.0	67.6	3.6	5.9	5.8	3.2	1665.0	146.0	2220.0	22.00	
100	EC329812	2	3	2	5	44.0	52.0	64.0	69.0	78.2	6.0	7.3	7.2	3.4	1998.0	148.0	3108.0	44.52	
101	EC343696	1	3	1	1	37.0	47.0	61.0	62.8	69.4	4.2	7.3	7.0	3.8	777.0	144.0	1110.0	28.52	
102	EC343749	1	2	1	4	44.0	51.0	61.0	56.2	73.8	4.6	5.9	5.8	3.4	3330.0	148.0	3330.0	23.43	
103	EC343808	1	2	1	1	44.0	52.0	64.0	34.8	46.2	3.2	4.4	4.3	3.2	444.0	141.0	27.8	15.00	
104	EC343855	1	2	1	6	47.0	56.0	70.0	61.4	71.0	5.0	6.2	6.3	3.4	2442.0	144.0	1887.0	28.42	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
105	EC034770	1	3	2	1	49.0	56.0	73.0	57.6	77.6	5.8	5.9	5.9	3.8	1554.0	142.0	3219.0	27.60	
106	EC354951	1	2	3	2	47.0	55.0	68.0	39.2	52.8	4.2	5.5	5.4	3.4	1221.0	137.0	222.0	34.04	
107	EC354984	1	3	2	5	58.0	65.0	78.0	58.4	61.0	5.6	6.7	6.6	3.4	777.0	144.0	333.0	28.23	
108	EC354985	1	3	2	2	45.0	53.0	65.0	63.2	75.6	6.0	6.9	6.6	3.8	1998.0	148.0	2775.0	27.66	
109	EC359685	1	3	2	2	40.0	47.0	61.0	81.4	91.2	6.4	6.7	6.7	3.4	3219.0	146.0	4662.0		
110	EC361787	1	2	2	2	63.0	70.0	80.0	50.4	66.0	4.6	6.7	7.0	3.6	555.0	152.0	2442.0	34.50	
111	EC374731	1	3	2	2	47.0	55.0	70.0	91.6	85.6	6.8	6.5	6.4	3.8	5106.0	146.0	2886.0	31.27	
112	EC382423	1	2	1	2	41.0	50.0	65.0	43.6	48.2	4.2	5.9	5.8	2.8	222.0	146.0	166.5	17.78	
113	EC399728	1	2	3	4	51.0	58.0	68.0	34.8	54.0	3.2	6.6	6.9	3.4	1110.0	148.0	1443.0	25.80	
114	EC007853	1	3	2	5	51.0	58.0	68.0	61.4	65.6	4.8	6.3	6.1	3.4	1443.0	153.0	2775.0	29.39	
115	IC117809	1	2	2	4	47.0	55.0	65.0	52.6	66.6	7.2	6.3	6.1	3.8	1665.0	141.0	2109.0	26.16	
116	IC248945	1	3	1	2	54.0	61.0	73.0	73.0	74.2	5.4	6.6	6.4	3.4	2220.0	142.0	2775.0	23.12	
117	IC267640	1	3	2	4	47.0	55.0	68.0	69.0	91.2	6.0	7.4	7.7	4.2	2442.0	141.0	4218.0	32.06	
118	IC267644	1	3	1	5	51.0	58.0	68.0	76.0	65.6	4.4	6.2	6.5	3.6	1443.0	146.0	3330.0	28.25	
119	IC267646	1	3	2	5	54.0	61.0	73.0	65.6	81.2	4.6	5.9	6.2	3.8	2664.0	142.0	3885.0	20.53	
120	IC267647	1	3	2	2	38.0	47.0	68.0	60.0	76.4	5.4	6.8	6.9	3.2	4440.0	144.0	3219.0	37.48	
121	IC267649	1	3	3	2	51.0	89.0	76.0	60.2	80.6	5.2	7.0	7.1	3.8	2997.0	146.0	2775.0	26.66	
122	IC276764-2	1	3	2	2	45.0	52.0	62.0	90.8	63.2	4.4	6.2	6.5	3.8	888.0	144.0	1443.0	24.86	
123	IC276939	1	2	3	5	45.0	52.0	63.0	32.2	58.8	3.8	5.6	5.9	3.4	721.5	144.0	1554.0	18.78	
124	IC331549	1	2	1	2	51.0	58.0	68.0	40.8	87.6	4.0	6.4	6.8	3.4	3441.0	146.0	4329.0	27.90	
125	IC331561	1	3	2	2	44.0	51.0	64.0	51.2	105.8	3.6	5.6	6.0	3.4	5439.0	146.0	4440.0	28.81	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/ pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
126	IC331564	1	2	1	4	37.0	47.0	58.0	31.0	50.8	3.8	5.6	5.5	2.8	888.0	142.0	55.5		
127	IC331571	1	3	2	4	54.0	61.0	73.0	54.6	93.2	5.2	6.7	7.0	3.6	3330.0	140.0	3885.0	29.37	
128	IC331598	1	2	2	2	44.0	53.0	65.0	60.2	64.6	4.4	6.8	6.6	4.0	1554.0	147.0	1665.0	19.10	
129	IC331887	1	3	2	4	49.0	56.0	68.0	49.6	106.4	5.8	6.1	6.5	3.8	3774.0	143.0	4995.0	26.34	
130	IC332102	1	1	1	5	51.0	58.0	68.0	33.4	47.4	3.4	4.8	5.1	3.0	444.0	150.0	888.0	14.07	
131	IC332127	1	2	1	5	47.0	56.0	68.0	50.4	49.0	4.8	5.9	5.7	3.2	888.0	146.0	1221.0	22.00	
132	IC332138	1	2	2	5	47.0	55.0	65.0	54.0	52.4	4.8	6.6	6.4	3.4	888.0	146.0	1443.0	19.45	
133	IC332147	1	2	1	6	49.0	58.0	70.0	29.2	39.6	3.4	5.3	5.1	2.8	222.0	141.0	2442.0	16.72	
134	IC342752	1	2	2	4	45.0	53.0	63.0	86.8	65.2	6.2	6.5	6.3	3.8	1665.0	144.0	1554.0	25.34	
135	IC346272	1	3	2	2	54.0	61.0	73.0	82.6	81.4	6.2	5.7	6.1	3.2	3330.0	149.0	3552.0	28.66	
136	IC347914	1	2	3	4	47.0	55.0	68.0	61.6	78.6	5.2	6.0	6.4	3.2	2775.0	144.0	3552.0	23.72	
137	IC348948	1	2	2	2	47.0	55.0	68.0	73.6	68.2	5.8	5.9	5.6	3.4	832.5	146.0	1110.0		
138	IC361426	1	2	1	5	63.0	70.0	80.0	51.0	97.8	5.8	6.8	7.2	4.0	8880.0	146.0	4662.0	29.52	
139	IC361427	1	3	2	4	39.0	47.0	58.0	65.0	85.8	5.6	7.0	7.4	3.6	3552.0	142.0	3774.0	27.43	
140	IC361435	1	2	3	5	43.0	50.0	64.0	33.4	53.4	2.8	5.1	5.2	3.4	666.0	144.0	55.5	19.18	
141	IC361438	1	2	2	5	44.0	51.0	64.0	36.2	63.4	3.6	5.9	6.3	3.4	1998.0	148.0	1554.0	19.30	
142	IC361481	1	2	2	3	37.0	46.0	58.0	22.6	47.8	3.8	7.8	7.5	4.4	777.0	139.0	555.0	37.00	
143	IC361490	1	2	1	2	51.0	58.0	68.0	73.2	69.8	6.0	5.6	5.9	3.4	3219.0	144.0	3441.0	21.02	
144	IC361494	1	2	2	2	54.0	61.0	73.0	54.0	66.4	5.4	6.1	6.4	3.8	1443.0	146.0	3330.0	26.70	
145	IC361496	1	3	1	5	37.0	45.0	58.0	36.4	105.4	4.2	6.7	7.1	3.6	6105.0	144.0	5550.0	40.84	
146	IC361498	1	3	2	2	37.0	45.0	58.0	71.8	97.2	6.8	6.9	7.3	4.2	3663.0	143.0	3996.0	28.58	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
147	IC493451	2	3	2	5	51.0	63.0	73.0	30.8	78.8	4.6	10.2	10.2	3.8	1665.0	146.0	1665.0	70.9	
148	IC493452	2	2	2	2	51.0	63.0	73.0	40.8	68.5	5.4	10.2	10.2	3.8	2109.0	144.0	1998.0	64.78	
149	IC493453	1	2	2	6	54.0	61.0	69.0	30.4	67.9	5.0	11.0	11.1	4.0	1665.0	148.0	2442.0	79.68	
150	IC493454	1	2	2	7	49.0	64.0	71.0	20.8	74.4	2.8	10.5	10.6	4.0	1998.0	141.0	2886.0	65.30	
151	IC493455	1	2	2	2	51.0	62.0	69.0	21.8	75.8	3.8	9.7	9.7	3.8	2109.0	146.0	2442.0	65.18	
152	IC493456	1	3	2	5	54.0	61.0	73.0	27.8	80.9	4.0	10.3	10.3	4.0	3330.0	144.0	2442.0	88.90	
153	IC493457	1	1	3	2	78.0	84.0	93.0	40.8	57.0	5.0	4.8	4.9	3.8	1776.0	146.0	555.0	84.38	
154	IC493458	1	L	2	1	54.0	59.0	68.0	35.8	78.8	4.2	10.3	10.4	4.0	3219.0	148.0	3219.0	78.34	
155	IC493459	2	3	2	2	54.0	59.0	71.0	22.8	77.4	3.6	12.4	12.4	4.0	2220.0	144.0	3219.0	86.80	
156	AKP 11/46	1	1	2	2	47.0	55.0	70.0	73.0	53.8	5.0	6.6	6.5	3.8	888.0	148.0	1221.0	22.06	
157	AKP 12/11	1	2	1	2	47.0	55.0	68.0	47.4	59.2	4.2	5.8	5.7	3.4	1110.0	144.0	1332.0	21.56	
158	AKP 12/18	1	3	3	5	63.0	70.0	80.0	70.2	65.8	5.4	5.8	6.2	3.4	999.0	141.0	1665.0	19.45	
159	BLM-K-S-7	1	1	2	2	54.0	61.0	73.0	18.2	44.0	3.2	5.7	6.1	2.8	333.0	143.0	111.0	19.50	
160	JBT 30/78	1	2	2	4	63.0	72.0	78.0	79.6	57.4	6.0	6.4	6.2	3.4	555.0	142.0	999.0	12.29	
161	JBT 36/89	1	3	1	5	40.0	47.0	61.0	88.4	63.8	5.4	5.3	5.3	2.8	444.0	145.0	555.0	25.60	
162	JBT 37/159	1	1	2	2	47.0	53.0	66.0	68.0	49.9	5.8	5.2	5.2	3.6	277.5	139.0	333.0	24.62	
163	JBT 38/144	1	2	2	2	54.0	62.0	74.0	82.2	51.8	5.2	5.0	5.1	3.6	222.0	143.0	444.0	22.47	
164	JPM 7	1	2	2	2	40.0	49.0	61.0	23.0	42.0	3.0	4.5	4.5	3.0	111.0	146.0	55.5		
165	JSSR 101	1	2	2	1	41.0	79.0	61.0	41.0	58.5	5.0	4.5	4.6	3.5	111.0	141.0	27.8	15.30	
166	JSSR 110	1	2	2	1	61.0	95.0	105.0	43.8	40.0	5.4	4.7	4.7	3.2	138.8	137.0	111.0	19.36	
167	JSSR 110	1	2	2	2	44.0	81.0	69.0	8.0	27.0	3.5	4.2	4.3	3.0	111.0	139.0	222.0		

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/ pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
168	KG 3/164	1	2	3	7	54.0	61.0	71.0	75.2	61.4	5.0	6.6	6.3	3.6	999.0	141.0	1776.0	24.51	
169	KG 3/93	1	2	3	5	44.0	51.0	61.0	55.8	41.2	6.0	6.1	6.5	3.4	333.0	146.0	555.0	25.78	
170	KG 3/98	1	3	1	5	63.0	70.0	80.0	82.8	60.8	5.4	5.4	5.7	3.6	999.0	142.0	1776.0	25.31	
171	KG 31/130	1	2	2	3	47.0	54.0	64.0	59.4	72.4	4.0	6.7	6.6	3.8	999.0	143.0	3330.0	15.25	
172	MKS/AKT 2/3	1	3	1	1	59.0	71.0	84.0	11.6	47.0	6.2	9.0	9.1	4.4	693.8	146.0	333.0	51.68	
173	MKS/AKT 260	1	3	1	2	99.0	105.0	117.0	4.8	42.5	3.8	8.6	8.7	3.3	555.0	135.0	27.8	47.65	
174	MKS/AKT 272	1	2	2	7	63.0	73.0	86.0	8.4	41.2	4.8	10.0	10.0	3.8	777.0	139.0	111.0	34.74	
175	MKS/TRS 1264	1	2	2	2	76.0	83.0	94.0	8.0	40.7	6.0	4.6	4.7	2.7	832.5	142.0	27.8	14.00	
176	MKS/TRS 1265	1	2	2	5	78.0	84.0	94.0	15.0	72.0	10.0	11.0	11.1	4.0	111.0	141.0	222.0	23.22	
177	NAZ/TA 06	1	2	1	4	78.0	86.0	98.0	24.4	46.4	4.2	5.7	5.7	3.8	1332.0	142.0	27.8	29.94	
178	NAZ/TA 18	1	2	1	2	91.0	97.0	105.0	27.8	57.8	7.0	6.9	6.9	3.6	1332.0	141.0	55.5	17.74	
179	VKG 17/10	1	1	1	2	54.0	61.0	73.0	74.0	59.6	6.4	5.6	5.7	3.2	999.0	144.0	333.0	17.94	
180	VKG 17/26	1	1	1	1	51.0	58.0	70.0	74.4	52.4	6.0	5.1	5.1	3.2	1110.0	139.0	333.0	13.87	
181	VKG 17/30	1	1	1	2	51.0	57.0	68.0	52.6	40.2	5.0	4.8	4.8	3.2	555.0	148.0	249.8	9.83	
182	VKG 18/46	1	1	1	5	47.0	54.0	66.0	61.2	41.0	5.4	4.8	4.9	2.8	777.0	144.0	555.0	17.80	
183	VKG 18/46	1	1	1	2	63.0	70.0	78.0	74.2	38.2	5.4	4.8	4.9	3.2	333.0	139.0	111.0	13.70	
184	VKG 27/128	1	2	1	5	58.0	68.0	78.0	74.8	49.4	6.4	5.1	5.1	3.4	610.5	144.0	333.0	21.00	
185	VKG 27/132	1	1	1	3	63.0	69.0	76.0	74.2	48.2	6.2	4.9	5.0	3.6	1110.0	142.0	666.0	24.80	
186	VKG 27/54	1	2	1	3	64.0	72.0	84.0	66.8	48.6	4.8	4.9	4.9	3.0	444.0	142.0	444.0	15.48	
187	VKG 28/2	1	2	1	1	42.0	80.0	63.0	40.4	45.0	5.6	4.9	4.9	3.2	555.0	142.0	111.0	16.26	
188	VKG 28/34	1	2	1	2	70.0	78.0	92.0	53.8	58.0	5.0	5.2	5.3	3.6	777.0	139.0	888.0	17.39	

S. No.	Accession No.	Qualitative characters				Quantitative characters													
		Stem colour	Leaf size	Grain size	Grain colour	Day to initial flowering	Days to 50% flowering	Days to pod set	No. of pods	Plant height (cm)	No. of branches	Pod length (cm)		No. of Grains/ pod	Dry matter yield (kg/ha)	Days to maturity	Seed yield (kg/ha)	100Seed yield(g)	
												Obs.	Adj.						
189	VKS 14/17	1	2	2	4	58.0	65.0	75.0	103.0	72.4	7.2	6.1	6.5	3.8	888.0	144.0	2109.0	22.62	
190	VKS 14/20	1	3	2	2	56.0	63.0	72.0	55.0	59.0	4.8	6.0	6.4	3.6	832.5	143.0	2220.0	21.17	
191	VKS 16/9	1	2	3	5	58.0	64.0	76.0	51.4	56.6	5.0	6.6	6.4	3.2	1332.0	144.0	888.0	24.37	
192	VKS-SCC 7/15	1	2	2	2	47.0	56.0	68.0	43.2	50.6	3.8	5.9	5.7	3.2	666.0	148.0	555.0	56.20	
193	VKS-SCC 7/2	1	2	3	2	47.0	54.0	63.0	46.4	56.0	4.4	5.9	5.7	3.6	666.0	137.0	1110.0	22.53	
Means for check varieties																			
	PRT 12	1	2	2	2	47.5	55.0	67.3	52.9	65.9	4.7	6.1		3.6	1484.6	145.4	1619.9	28.61	
	PRT 7	1	3	2	2	50.3	58.5	69.8	66.8	78.6	5.3	6.4		3.7	2157.6	140.9	2476.7	26.09	
	VH 82-1	1	2	2	2	47.8	59.8	67.8	49.8	64.4	4.4	5.8		3.7	2095.1	142.9	1991.1	25.87	
	Minimum					37.0	44.0	52.0	4.8	27.0	2.0	4.2		2.7	111.0	135.0	27.8	9.8	
	Maximum					99.0	105.0	117.0	103.0	106.4	10.0	12.4		4.4	8880.0	154.0	5550.0	88.9	
	Mean					50.0	58.7	69.7	52.1	67.2	5.0	6.5		3.5	1737.3	144.1	1951.8	28.1	
	CD1(0.05)					NS	NS	NS	NS	NS	NS	0.4		NS	NS	NS	NS	NS	
	CD2(0.05)					NS	NS	NS	NS	NS	NS	1.0		NS	NS	NS	NS	NS	
	CD3(0.05)					NS	NS	NS	NS	NS	NS	1.2		NS	NS	NS	NS	NS	
	CD4(0.05)					NS	NS	NS	NS	NS	NS	0.9		NS	NS	NS	NS	NS	
	CV (%) Error					14.86	18.59	9.12	39.74	34.85	24.81	10.99		10.93	84.24	3.38	93.38		

Quantitative characters: Stem colour: 1-Light green, 2-Dark green, 99-Others; Leaf size: 3-Small, 5-Medium, 7-Large, 99-Others; Grain size: 1-Flattened, 2-Round, 3-Angular, 99-Others; Grain colour: 1-White, 2-Yellow, 3-Grey, 4-Violet, 5-Light green, 6-Dark green, 7-Light brown, 8-Dark brown, 9-Red, 10-Black, 99-Others. CD1: Critical difference between two checks varieties, CD2: Critical different between two accessions in the same blocks, CD3: Critical difference between two accessions in different blocks: CD4: Critical difference between in check variety and an accession: NS: Not significant

Table 113. Promising lines in Winged bean germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
Rahuri (Accessions 19)			
1.	Days to flowering	56.0-59.0	IC-45229-1, EC-178288, EC-21904, EC-142667, EC-27886-A-2 < (57.0 days)
2.	Days to maturity	122.0-159.0	EC-178287, EC-21904, EC-27886-A-2, EC-178288, EC-142667 < (151.0 days)
3.	Pods per plot (g)	139.0-476.00	EC-27886, IC-95222, EC-142654-4, EC-178287, EC-178266, IC-42416, EC-27885-1, EC-142654-4 > (274.0 g)
4.	Wet pod weight per plot (g)	1010.0-2900.0	EC-142654-4, EC-27885-1, IC-112417, IC-95222, EC-27886, EC-142667, EC-178287, IC-42416, EC-116887, IC-95248, EC-27886-A-2 > (2000.0 g)
5.	Seed weight/plant (g)	15.0-27.0	IC-95222, EC-27886, EC-142654-4, EC-142662, EC-142654-4, EC-21904, IC-45229-1 > (19.0 g)
6.	Seed yield (q/ha)	1138.0-1610.0	EC-142667, IC-45229-1, IC-112417, EC-142662, EC-27885-1, EC-142654, EC-21904, IC-42416, EC-178288, EC-27886, EC-142654-4, EC-116887, IC-95248, EC-27886-A-2 > (13.0 q/ha)
7.	100 seed weight (g)	25.8-30.0	EC-142662, EC-142654-4, EC-178288, EC-27886, EC-116887, EC-27886-A-2, IC-95222 > (29.0 g)
Ranchi (Accessions 25)			
1.	Days to flowering	66.0-90.0	IC95234, EC 27885-1 < (70.0 days)
2.	Days to maturity	153.0-187.0	IC95234, EC 27885-1 > (150.0 days)
3.	Plant height (cm)	13.0-286.0	EC 178287, EC 178266 > (284.0 cm)
4.	Pods per plant	8.0-20.0	IC95234, EC 178266 > (17.0)
5.	Pod length (cm)	12.0-19.0	IC45229-1, EC 114273-B > (18.0 cm)
6.	No. of seeds per pods	5.2-7.4	EC 178287, EC 178288 > (7.2)
Ambikapur (Accessions 14)			
1.	Days to flowering	77.0-105.5	IC 95222, EC 178288 < (83.0 days)
2.	Days to maturity	155.0-174.5	EC 142662, IC 95222 > (157.0 days)
3.	Plant height (cm)	200.9-325.3	IC 95248, EC 21904 > (307.0 cm)
4.	No. of branches per plant	2.7-4.5	EC 27886-A2, EC 142654-4 > (4.0)
5.	No. of Pods per plant	1.2-35.0	IC 95248, EC 116887 > (11.0)
6.	Pod length (cm)	12.2-18.1	EC 21904, EC 178287 > (16.0 cm)
7.	Plant stand	2.0-8.0	EC 178287, EC 178288, EC 142654 > (6.0)
8.	Yield per plant (g)	2.0-76.7	IC 95248, EC 116887 > (24.0 g)
9.	Yield (q/ha)	56.0-639.0	IC 95248, EC 142654-4 > (3.05 q/ha)

S.No.	Characters	Range	Promising lines
Bangalore (Accessions 30)			
1.	Plant height (cm)	78.0-184.0	NBRI-Sel, Dwarf mutant, EC038955, Mysore local > (153.0 cm), Check AKWB-1 (152.0 cm)
2.	Pods per plant	4.6-15.2	IC095222, EC116889, EC121918, EC121919-A, EC178269, EC146654, EC114273-B, EC178287, EC042416, EC116887 > (11.5), Check AKWB-1 (11.5)
3.	Pod length (cm)	7.5-14.5	IC027885-1, Mysore local, NBRI-Sel, IC045229-1 > (13.5 cm), Check AKWB-1 (13.5 cm)
4.	Seeds per pod	5.0-10.4	Mysore local > (10.2), Check AKWB-1 (10.2)
5.	Seed yield per plant (g)	8.0-23.0	NBRI-Sel > (22.0 g), Check AKWB-1 (20.8 g)
6.	Days to flowering	50.0-68.0	IC095248, IC095234, IC027885-1, EC027886-AZ, IC112417, EC178287, IC178266, EC146662, IC045229-1, EC121919-A < (57.0 days), Check AKWB-1 (64.0 days)
7.	Days to maturity	140.0-159.0	IC178266, IC095248, IC095234, IC045229-1, IC027885-1, EC021908, EC146662, EC027886, EC027886-AZ, EC178287, NBRI-Sel < (151.0 days), Check AKWB-1 (155.0 days)
8.	100 seed weight (g)	16.2-25.3	Dwarf mutant, Mysore local, EC027886-AZ, EC146654-4 > (21.0 g), Check AKWB-1 (21.2 g)
Best entries on three locations (Rahuri, Ranchi & Ambikapur)			
1.	Days to flowering	66.0-86.0	IC095234, IC095222, EC021904, EC027885-1 < (73.0 days)
2.	Days to maturity	153.0-187.0	IC095234, EC142667, EC142662, EC178287 < (158.0 days)
3.	Plant height (cm)	170.0-293.4	EC178266, EC142667, EC178287, IC095248 > (277.0 cm)
4.	No. of pods per plant	8.0-163.9	EC027886, IC095222, EC142654-4, EC178287 > (139.0)
5.	Pod length (cm)	12.8-19.0	EC114273-B, IC095234, EC121918, IC045229-1 > (16.0 cm)
6.	Plant stand	10.5-13.5	EC178296, EC027885-1, EC178287, EC178288 > (12.0)
7.	Seed yield per plant (g)	10.0-45.9	IC095248, IC095222, EC142654-4, EC116887 > (20.0 g)
8.	Seed yield (q/ha)	680.0-986.0	IC095248, EC027885-1, EC142667, IC045229-1 > (8.0 q/ha)

Table 114. Multilocation evaluation of germplasm lines in winged bean at Ambikapur, Ranchi and Rahuri – Plains (2005)

S. No.	Accession No.	Days to flowering				Days to maturity				Plant height (cm)			No of pod/plant			
		Ranchi	Ambikapur	Rahuri	Mean	Ranchi	Ambikapur	Rahuri	Mean	Ranchi	Ambikapur	Mean	Ranchi	Ambikapur	Rahuri	Mean
1	EC021904	72	84.0	56.0	70.7	160	165.0	150.0	158.3	193	307.6	250.3	18	5.8	252.0	91.9
2	EC027885-1	69	90.0	57.0	72.0	155	173.0	155.0	161.0	206	267.0	236.5	13	7.2	275.0	98.4
3	EC027886	78	96.5	59.0	77.8	163	166.0	152.0	160.3	176	288.0	232.0	11	4.7	476.0	163.9
4	EC027886-A2	89	86.0	56.0	77.0	169	167.0	150.0	162.0	210	283.8	246.9	9	6.5	155.0	56.8
5	EC114273-B	85			85.0	187			187.0	181		181.0	12			12.0
6	EC116887	76	94.5	59.0	76.5	168	165.0	152.0	161.7	176	272.5	224.3	15	11.5	261.0	95.8
7	EC116889	73			73.0	163			163.0	230		230.0	8			8.0
8	EC121918	76			76.0	167			167.0	205		205.0	9			9.0
9	EC121919-A	82			82.0	183			183.0	245		245.0	11			11.0
10	EC142654	80	84.0	57.0	73.7	175	169.5	155.0	166.5	178	269.6	223.8	10	6.1	275.0	97.0
11	EC142654-4	75	85.0	57.0	72.3	158	173.0	155.0	162.0	230	291.8	260.9	16	10.4	402.0	142.8
12	EC142662	79	89.0	57.0	75.0	162	155.0	151.0	156.0	209	297.5	253.3	14	7.0	163.0	61.3
13	EC142667	72	88.0	56.0	72.0	160	156.5	150.0	155.5	278	293.1	285.6	13	4.0	160.0	59.0
14	EC178266	79	86.0	58.0	74.3	170	172.0	153.0	165.0	283	303.8	293.4	18	4.0	370.0	130.7
15	EC178269	86			86.0	182			182.0	243		243.0	12			12.0
16	EC178287	90	85.0	59.0	78.0	184	166.0	122.0	157.3	286	274.0	280.0	8	10.0	396.0	138.0
17	EC178288	84	82.0	56.0	74.0	175	174.5	150.0	166.5	168	285.9	227.0	14	9.0	150.0	57.7

S. No.	Accession No.	Pod length (cm)			Plant stand (%)			Seed yield/plant(g)			Seed yield(kg/ha)			Wet pod yield (g/ha)	100seed weight(g)	No. of branches/plant	No. of seeds/pods
		Ranchi	Ambikapur	Mean	Ambikapur	Rahuri	Mean	Ambikapur	Rahuri	Mean	Ambikapur	Rahuri	Mean	Rahuri	Rahuri	Ambikapur	Ranchi
1	EC021904	15	18.1	16.6	4.0	19.0	11.5	17.5	20.0	18.8	194.0	1444.0	819.0	52.5	29.5	3.8	5.4
2	EC027885-1	16	15.6	15.8	6.0	20.0	13.0	13.0	17.0	15.0	222.0	1499.0	860.5	78.9	28.8	3.0	6.8
3	EC027886	17	15.4	16.2	6.0	19.0	12.5	10.0	23.0	16.5	167.0	1338.0	752.5	61.4	30.0	3.6	7.1
4	EC027886-A2	16	13.8	14.9	4.0	19.0	11.5	10.0	16.0	13.0	222.0	1305.0	763.5	58.3	30.0	4.5	5.8
5	EC114273-B	19		19.0													6.4
6	EC116887	14	14.8	14.4	2.0	19.0	10.5	25.0	16.0	20.5	278.0	1333.0	805.5	58.9	30.0	3.5	5.2
7	EC116889	16		16.0													7.2
8	EC121918	17		17.0													6.9
9	EC121919-A	15		15.0													7.1
10	EC142654	13	14.7	13.9	7.0	19.0	13.0	10.0	23.0	16.5	194.0	1444.0	819.0	54.7	30.0	3.7	6.2
11	EC142654-4	14	15.3	14.7	5.0	20.0	12.5	22.0	20.0	21.0	306.0	1338.0	822.0	80.6	25.9	4.1	6.8
12	EC142662	15	14.7	14.9	3.0	18.0	10.5	13.3	22.0	17.7	111.0	1499.0	805.0	30.8	30.0	3.7	5.5
13	EC142667	18	13.6	15.8	7.0	18.0	12.5	5.7	17.0	11.4	111.0	1610.0	860.5	61.4	28.8	2.8	6.7
14	EC178266	16	13.5	14.8	5.0	20.0	12.5	4.0	18.0	11.0	111.0	1277.0	694.0	55.6	29.1	3.0	7.2
15	EC178269	15		15.0													5.8
16	EC178287	14	16.7	15.4	8.0	18.0	13.0	20.0	18.0	19.0	222.0	1138.0	680.0	61.1	29.3	2.7	7.4
17	EC178288	15	14.5	14.8	8.0	18.0	13.0	14.0	18.0	16.0	194.0	1360.0	777.0	28.1	30.0	3.4	7.3

S. No.	Accession No.	Days to flowering				Days to maturity				Plant height (cm)			No of pod/plant			
		Ranchi	Ambikapur	Rahuri	Mean	Ranchi	Ambikapur	Rahuri	Mean	Ranchi	Ambikapur	Mean	Ranchi	Ambikapur	Rahuri	Mean
18	EC178296	88	98.5	59.0	81.8	179	173.5	152.0	168.2	195	200.9	198.0	12	10.7	147.0	56.6
19	IC045229-1	80	99.0	56.0	78.3	170	159.5	159.0	162.8	189	234.0	211.5	16	6.7	188.0	70.2
20	IC095222	75	77.0	58.0	70.0	165	156.0	152.0	157.7	130	231.0	180.5	18	9.5	427.0	151.5
21	IC095234	66			66.0	153			153.0	170		170.0	20			20.0
22	IC095236	83	86.0	59.0	76.0	180	159.0	152.0	163.7	210	248.3	229.2	15	3.5	139.0	52.5
23	IC095248	86	91.5	57.0	78.2	176	173.5	151.0	166.8	230	325.3	277.7	14	35.0	272.0	107.0
24	IC112416	78	105.0	58.0	80.3	157	169.0	157.0	161.0	250	267.0	258.5	10	1.2	356.0	122.4
25	IC112417	88	105.5	59.0	84.2	183	174.5	152.0	169.8	187	202.5	194.8	8	2.3	232.0	80.8
	Minimum	66.0	77.0	56.0	66.0	153.0	155.0	122.0	153.0	130.0	200.9	170.0	8.0	1.2	139.0	8.0
	Maximum	90.0	105.5	59.0	86.0	187.0	174.5	159.0	187.0	286.0	325.3	293.4	20.0	35.0	476.0	163.9
	Mean	79.6	90.1	57.5	76.4	169.8	166.7	151.1	164.7	210.3	270.7	233.5	13.0	8.2	268.2	76.3
	SD	6.5	7.8	1.2	4.9	10.1	6.7	7.5	8.4	38.9	34.0	33.4	3.5	7.1	108.0	48.4
	CV(%)	8.2	8.6	2.1	6.5	6.0	4.0	4.9	5.1	18.5	12.6	14.3	26.8	87.4	40.3	63.5

S. No.	Accession No.	Pod length (cm)			Plant stand (%)			Seed yield/plant(g)			Seed yield(kg/ha)			Wet pod yielw (q/ha)	100seed weight(g)	No. of branches/plant	No. of seeds /pods
		Ranchi	Ambikapur	Mean	Ambikapur	Rahuri	Mean	Ambikapur	Rahuri	Mean	Ambikapur	Rahuri	Mean	Rahuri	Rahuri	Ambikapur	Ranchi
18	EC178296	12	13.6	12.8	7.0	20.0	13.5	20.0	18.0	19.0	167.0	1222.0	694.5	31.9	28.6	3.0	6.8
19	IC045229-1	19	14.3	16.7	3.0	20.0	11.5	10.0	20.0	15.0	167.0	1527.0	847.0	51.1	28.2	4.0	5.5
20	IC095222	16	15.5	15.8	4.0	18.0	11.0	20.0	27.0	23.5	222.0	1138.0	680.0	63.9	30.0	3.5	6.5
21	IC095234	17		17.0													6.2
22	IC095236	14	13.9	14.0	4.0	20.0	12.0	5.0	18.0	11.5	111.0	1249.0	680.0	41.7	25.8	3.0	5.4
23	IC095248	16	12.6	14.3	3.0	19.0	11.0	76.7	15.0	45.9	639.0	1333.0	986.0	58.3	27.7	3.3	5.3
24	IC112416	15	12.2	13.6	5.0	20.0	12.5	2.0	18.0	10.0	56.0	1388.0	722.0	59.7	29.0	2.8	5.2
25	IC112417	13	14.6	13.8	4.0	19.0	11.5	6.3	19.0	12.7	69.0	1527.0	798.0	68.3	27.8	2.7	6
	Minimum	12.0	12.2	12.8	2.0	18.0	10.5	2.0	15.0	10.0	56.0	1138.0	680.0	28.1	25.8	2.7	5.2
	Maximum	19.0	18.1	19.0	8.0	20.0	13.5	76.7	27.0	45.9	639.0	1610.0	986.0	80.6	30.0	4.5	7.4
	Mean	15.5	14.6	15.3	5.0	19.1	12.1	16.0	19.1	17.6	198.1	1366.8	782.4	55.6	28.9	3.4	6.3
	SD	1.8	1.4	1.3	1.8	0.8	0.9	16.1	2.9	7.8	125.8	131.9	80.0	14.3	1.3	0.5	0.7
	CV(%)	11.4	9.4	8.8	35.9	4.2	7.6	100.6	15.4	44.5	63.5	9.7	10.2	25.7	4.5	15.3	11.8

Table 115. Evaluation of germplasm line of Wingedbean, Bangalore

S. No.	Accession No.	Plant height (cm)	Pods per plant	Pod length (cm)	Seeds per pod	Seed yield per plant (g)	Days to flowering	Days to maturity	100 seed weight (g)
1	Dwarf mutant	182.0	5.0	10.8	7.0	12.0	68	154	25.3
2	EC021908	137.0	9.2	8.6	6.5	8.0	58	148	19.8
3	EC027886	135.0	11.4	7.5	5.0	8.5	57	149	16.8
4	EC027886-AZ	132.5	11.0	9.5	7.0	9.2	54	150	22.0
5	EC038955	174.0	4.6	9.6	5.2	10.0	65	153	17.8
6	EC042416	136.7	12.0	10.5	7.5	9.5	59	155	16.5
7	EC095236	138.5	10.2	9.2	6.0	9.2	62	155	19.8
8	EC114273-B	140.0	12.5	8.0	6.1	11.0	61	157	19.5
9	EC116887	132.8	11.8	8.0	5.1	10.2	58	154	17.8
10	EC116889	144.0	13.5	9.1	8.2	10.5	59	153	17.5
11	EC121918	138.0	13.2	7.5	5.2	11.5	60	158	17.8
12	EC121919-A	136.7	13.2	8.5	5.1	9.8	56	152	19.5
13	EC142667	140.5	11.5	8.2	5.0	9.8	60	158	20.1
14	EC146654	138.8	12.8	10.2	6.8	10.8	62	159	16.8
15	EC146654-4	135.6	9.8	8.6	5.5	8.2	61	156	22.0
16	EC146662	142.6	9.8	9.2	6.8	8.5	55	149	21.0
17	EC178269	143.6	12.8	9.6	5.6	9.5	63	158	19.0
18	EC178287	134.6	12.4	9.2	5.6	10.5	55	150	18.2
19	EC178288	132.0	11.5	10.5	7.2	10.2	58	154	18.2
20	IC027885-1	130.5	10.2	14.5	8.5	11.0	54	145	19.2
21	IC045229-1	145.6	10.0	13.6	9.2	11.5	56	144	20.2
22	IC095222	141.6	15.2	9.5	5.5	12.8	59	155	21.2
23	IC095234	120.2	7.8	12.5	7.5	10.8	52	144	16.2
24	IC095248	78.0	6.2	9.2	6.0	10.5	50	142	18.2

S. No.	Accession No.	Plant height (cm)	Pods per plant	Pod length (cm)	Seeds per pod	Seed yield per plant (g)	Days to flowering	Days to maturity	100 seed weight (g)
25	IC112417	126.0	10.2	8.0	5.2	8.8	54	151	17.5
26	IC178266	120.2	9.1	10.2	8.0	9.2	55	140	17.0
27	IC178296	135.4	8.8	11.6	7.0	9.0	60	152	18.1
28	Mysore local	154.0	10.0	14.1	10.4	20.0	67	158	23.0
29	NBRI-Sel	184.0	11.0	14.0	8.2	23.0	64	150	20.0
30	AKWB-1 (C)	152.0	11.5	13.5	10.2	20.8	64	155	21.2
	Minimum	78.0	4.6	7.5	5.0	8.0	50	140	16.2
	Maximum	184.0	15.2	14.5	10.4	23.0	68	159	25.3
	Mean	139.4	10.6	10.1	6.7	11.1	59	152	19.2
	CV(%)	13.6	22.9	20.6	22.7	32.6	7	3	11.0

Table 116. Promising lines in Kalingada germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines	Highest value of best check
S.K. Nagar (Accessions 50)				
1.	100 seed weight (g)	0.1-0.4	SKNK-656, SKNK-651, SKNK-2, SKNK-655, SKNK-660, SKNK-665, SKNK-666, SKNK-675, SKNK-676, SKNK-678, SKNK-678 (2), SKNK-679 B), MALIWAS, SKNK-681, SKNK-1 > (0.07 G)	GK-1 (0.07 g)
2.	Fruit weight/plot (kg)	4.4-21.0	SKNK-680, SKNK-681, SKNK-683, SKNK-679 (B), SKNK-674, SKNK-665, SKNK-653 > (12.0 kg))	GK-1 (11.23 kg)
3.	No. of fruit per plot	19.0-52.7	SKNK-680, SKNK-681, SKNK-679 (B), SKNK-678 (2), SKNK-665, SKNK-678, SKNK-673 > (39.67)	GK-1 (36.33)
4.	No. of seed per fruit	365.1-2145.7	SKNK-684, SKNK-2, SKNK-664, SKNK-680, SKNK-679 (B), VADVAS 2, SKNK-678 (2), SKNK-671, SKNK-667, SKNK-656, SKNK-654, SKNK-650, SKNK-649, SKNK-1, SKNK-669, SKNK-670, SKNK-653, SKNK-658 > (600.0)	GK-1 (449.3)
5.	Node no. at which male flower appearance	13.3-27.1	SKNK-671, SKNK-679 (B), SKNK-665, SKNK-678, SKNK-668, SKNK-678 (2), SKNK-683, SKNK-658, SKNK-672, SKNK-681, SKNK-682, SKNK-657, SKNK-648, SKNK-656, SKNK-680, SKNK-670, SKNK-667 > (21.93)	GK-1 (19.67)
6.	Node no. at which female flower appearance	21.6-36.9	SKNK-671, SKNK-679 (B), SKNK-684, SKNK-657, SKNK-680, SKNK-658, SKNK-681, SKNK-682, SKNK-678 (2), SKNK-683, SKNK-668, SKNK-672, SKNK-678, SKNK-673, SKNK-665, SKNK-667 > (29.87)	GK-1 (25.47)
7.	Main vein length (cm)	263.7-624.7	SKNK-680, SKNK-654, MALIWAS, SKNK-656, SKNK-653, SKNK-647, SKNK-649, SKNK-675, SKNK-645, SKNK-681, SKNK-659 > (526.4 cm)	GK-1 (499.33 cm)
8.	Fruit girth (cm)	11.8-48.2	SKNK-673, SKNK-679 (B), SKNK-680, SKNK-660, SKNK-678 (2), SKNK-657, SKNK-664, MALIWAS, SKNK-663, SKNK-677, SKNK-662 > (160.0 cm)	GK-1 (14.00 cm)
9.	Seed weight (g)	9.3-68.1	SKNK-667, SKNK-675, SKNK-682 > (60.0 g)	GK-1 (50.67 g)

S.No.	Characters	Range	Promising lines	Highest value of best check
Mandor (Accessions 50)				
1.	Seed yield (q/ha)	35.0-275.0	SKNK 112, SKNK 129, SKNK 127, SKNK 136, SKNK 113 > (2.0 q/ha)	
2.	No. of fruits per plant	2.0-8.7	SKNK 129, SKNK 119, SKNK 112, SKNK 127, SKNK 131 > (6.0)	
3.	Fruit yield per plant (kg)	0.2-2.2	SKNK 129, SKNK 138, SKNK 112, SKNK 127, SKNK 131 > (1.2 kg)	
4.	Single fruit weight (g)	88.0-452.0	SKNK 138, SKNK 136, SKNK 140, SKNK 112, SKNK 102 > (260.0 g)	
5.	Fruit circumference (cm)	20.3-35.7	SKNK 138, SKNK 129, SKNK 140, SKNK 130, SKNK 103 > (29.0 cm)	
6.	100 seed weight (g)	5.7-8.3	SKNK 140, SKNK 138, SKNK 136, SKNK 112, SKNK 129 > (7.5 g)	

Table 117. Evaluation of germplasm lines in Kalingada at S.K. Nagar – Plains (2005)

S. No.	Accession No.	Test weight (100 seed) (g)	Fruit weight/plot(kg)	No. of Fruit / plot	Days to First male flower	Days to First Female Flower	No. of seed per fruit	Node no. at which male flower appearance	Node no. at which female flower appearance	Main vein length (cm)	Fruit girth (cm)	Seed weight (g)
1	GK-1	0.07	11.23	36.33	35.33	46.33	449.3	19.67	25.47	499.33	14	50.67
2	MALIWAS	0.08	8.17	36.67	40	49.33	510.3	20	27.47	597	16.27	14.87
3	SKNK001	0.08	6.1	32	37	48.33	606.9	17.53	26.33	488.67	15.03	36.27
4	SKNK002	0.09	5.67	31.33	38.33	47.67	1703	19.8	27.6	461.67	15.58	24.47
5	SKNK003	0.06	8.93	39.33	39.67	48.33	553.3	13.53	21.6	526.4	15.33	27.8
6	SKNK004	0.07	8.7	36.67	39.33	48.67	515	20	28.27	395.27	15.41	23.03
7	SKNK644	0.06	4.97	29	38.33	47.67	385.5	20.47	29.33	477.93	14.55	19.8
8	SKNK645	0.07	7.37	29.67	41	48.67	555.1	13.87	26.53	534.53	14.99	43.6
9	SKNK646	0.07	5.13	25.33	39.67	48.33	502.5	19.2	27	263.67	15.82	41.17
10	SKNK647	0.07	5.9	28.33	37.33	46.67	550.2	15	24.73	558.6	14.72	36.63
11	SKNK648	0.07	5.93	27	46	49.33	589	22.47	27.53	480.8	15.86	42.1
12	SKNK649	0.06	7.8	35.33	37	47.33	608.7	17	25.53	551.67	14.24	32.77
13	SKNK650	0.07	4.47	26.67	40.67	49.33	616	21.27	29.07	463.87	14.68	27.4
14	SKNK651	0.33	9.4	31.33	40.67	49.67	499.2	19	26.07	468.53	15.36	20.4
15	SKNK652	0.07	5.07	29.67	40.33	50.67	525.7	19.53	26.6	468.27	11.79	22.17
16	SKNK653	0.07	12.47	38	40.67	50	602.3	18	26.8	568.13	14.25	41.9
17	SKNK654	0.06	9.46	36.67	40.33	50.67	620.9	18.67	27.2	619.2	13.68	35.03
18	SKNK655	0.08	6.57	31.67	39.67	48.33	592.9	19.67	26.8	435.8	13.96	22.93
19	SKNK656	0.4	11.1	35.33	38	48	622.5	22.33	29.6	586.67	15.37	46.47
20	SKNK657	0.07	5.9	19	37.33	52	365.1	22.87	33.67	381.6	16.29	29.67
21	SKNK658	0.07	4.9	29.67	38.67	47.33	600.4	24.33	32.8	516	15.31	16.93
22	SKNK659	0.07	4.62	26.67	40.33	47.33	584.1	17.07	26.47	530.4	15.08	47.07

S. No.	Accession No.	Test weight (100 seed) (g)	Fruit weight/plot(kg)	No. of Fruit / plot	Days to First male flower	Days to First Female Flower	No. of seed per fruit	Node no. at which male flower appearance	Node no. at which female flower appearance	Main vein length (cm)	Fruit girth (cm)	Seed weight (g)
23	SKNK660	0.08	9.07	35.67	42.33	47.33	561.1	18.93	27.67	444.07	16.47	20.17
24	SKNK661	0.07	8.2	31.33	40.33	50.33	538.9	16.4	27.13	327.2	13.99	21.47
25	SKNK662	0.07	7.4	29.67	42	50	596	18.87	29	277	16.06	25.5
26	SKNK663	0.06	5.17	27	41	49.67	576.4	21.27	27.2	304.6	16.22	21.07
27	SKNK664	0.07	5.17	35	39.33	48.33	702.1	20.07	28.87	362.2	16.29	45.17
28	SKNK665	0.08	12.67	41.33	40.33	49.33	589.3	26.47	30.33	381.47	15.35	28.73
29	SKNK666	0.08	7.67	35.33	43	51.67	589.2	21.2	29.47	438.47	15.42	13.83
30	SKNK667	0.07	4.43	23	44.33	50	632	22	30.2	501.2	15.85	68.1
31	SKNK668	0.07	7.63	34.33	41.33	49.67	581.5	24.73	31.47	477.4	14.51	38.83
32	SKNK669	0.06	6.27	36.67	40	48.67	604.7	17.8	29.07	456.6	14.99	13.2
33	SKNK670	0.07	6	30.33	39	48.67	603.5	22.2	29.07	294.67	15.61	30.5
34	SKNK671	0.07	6.33	32	39.67	48.67	642	27.07	36.87	301.47	13.97	13.5
35	SKNK672	0.07	10.23	32.33	39.33	48.67	525.5	23.8	31.47	451.67	14.34	18.13
36	SKNK673	0.07	11.83	40	39.33	48	457.3	21.6	30.71	456.4	48.19	12.57
37	SKNK674	0.07	13.67	38.67	39	49.67	483	13.33	22.8	411.53	15.88	47
38	SKNK675	0.08	9.7	36.67	39.67	49	538.5	20.27	29.4	550.8	15.84	67.97
39	SKNK676	0.08	10.73	39.67	37.67	49.67	525.3	16.73	26.4	523.67	15.82	40.13
40	SKNK677	0.06	9.7	36.67	39.67	50	569.7	19.07	27.13	410.73	16.15	15.43
41	SKNK678	0.08	11.87	40.67	40	50	529	25.07	30.8	417.87	15.79	39.67
42	SKNK678 (2)	0.08	11.33	43.33	39.33	49.33	643.4	24.67	31.53	424.2	16.29	28.17
43	SKNK679 (B)	0.08	14.47	46.67	38	48.33	652.2	26.87	36.27	439.93	17.01	41.27
44	SKNK680	0.06	21	52.67	39	49.67	685.3	22.2	33.4	624.67	16.61	28.1

S. No.	Accession No.	Test weight (100 seed) (g)	Fruit weight/plot(kg)	No. of Fruit / plot	Days to First male flower	Days to First Female Flower	No. of seed per fruit	Node no. at which male flower appearance	Node no. at which female flower appearance	Main vein length (cm)	Fruit girth (cm)	Seed weight (gm)
45	SKNK681	0.07	9.05	32	41	48.67	524.4	23.4	32.13	532.6	15.17	17.43
46	SKNK681	0.08	20.57	52	41	50	575	20	29.87	384.93	15.35	46.47
47	SKNK682	0.05	7.7	38.67	39.67	48.67	563.3	23.27	31.6	512.87	14.95	60.33
48	SKNK683	0.06	15.77	29.33	38	47.67	568.9	24.53	31.53	433.2	15.77	37.77
49	SKNK684	0.06	7	35.67	37.33	49	2145.7	21.93	34.73	497.33	15.19	9.33
50	VADVAS 2	0.07	8.3	32	42.33	49	652.2	17.4	25.47	394.13	14.21	20.6
	Minimum	0.1	4.4	19.0	35.3	46.3	365.1	13.3	21.6	263.7	11.8	9.3
	Maximum	0.4	21.0	52.7	46.0	52.0	2145.7	27.1	36.9	624.7	48.2	68.1
	Mean	0.1	8.8	34.2	39.8	49.0	620.3	20.4	28.9	458.1	15.9	31.5
	SD	0.1	3.7	6.5	1.9	1.2	280.5	3.3	3.1	87.4	4.8	14.2
	CV(%)	72.1	42.6	19.0	4.8	2.4	45.2	16.2	10.8	19.1	29.9	45.1

Table 118. Evaluation of germplasm lines in Karingada at Mandor – Plains (2005)

S. No.	Entry	Seed yield (kg/ha)	No. of fruits/ plant	Fruit yield/ plant (Kg)	Single fruit weight (g)	Fruit circumference (cm)	100-seed weight
1	SKNK 101	143.0	5.0	1.0	206.0	24.7	7.2
2	SKNK 102	121.0	3.3	0.9	270.0	27.3	7.3
3	SKNK 103	225.0	6.3	1.4	219.0	29.3	7.6
4	SKNK 104	129.0	4.3	1.0	222.0	26.3	6.9
5	SKNK 105	64.0	3.3	0.5	142.0	25.7	6.6
6	SKNK 106	88.0	5.0	0.6	112.0	25.3	6.7
7	SKNK 107	110.0	4.3	0.8	179.0	28.0	6.8
8	SKNK 108	50.0	3.0	0.3	88.0	22.7	6.2
9	SKNK 109	48.0	3.0	0.3	90.0	20.7	5.9
10	SKNK 110	54.0	3.0	0.4	123.0	22.3	7.2
11	SKNK 111	35.0	2.3	0.2	95.0	20.7	6.0
12	SKNK 112	275.0	7.0	2.1	294.0	29.0	8.0
13	SKNK 113	228.0	6.0	1.4	239.0	25.7	7.5
14	SKNK 114	46.0	3.7	0.3	95.0	22.0	5.7
15	SKNK 115	94.0	3.7	0.5	129.0	22.3	5.9
16	SKNK 116	129.0	3.7	0.7	194.0	29.3	6.9
17	SKNK 117	152.0	6.3	1.0	159.0	23.0	7.5
18	SKNK 119	206.0	7.3	1.3	177.0	27.0	7.0
19	SKNK 120	129.0	4.3	0.7	158.0	23.7	6.9
20	SKNK 121	106.0	3.7	0.7	182.0	22.0	6.9
21	SKNK 122	42.0	2.0	0.3	145.0	20.3	6.6
22	SKNK 123	94.0	3.3	0.6	192.0	24.3	7.2

S. No.	Entry	Seed yield (kg/ha)	No. of fruits/ plant	Fruit yield/ plant (Kg)	Single fruit weight (g)	Fruit circumference (cm)	100-seed weight
23	SKNK 124	80.0	3.3	0.6	178.0	26.3	6.2
24	SKNK 125	88.0	3.3	0.7	200.0	26.7	7.3
25	SKNK 126	157.0	5.0	1.0	194.0	27.7	7.8
26	SKNK 127	238.0	7.0	1.7	237.0	27.3	7.5
27	SKNK 128	106.0	3.7	0.8	224.0	25.0	7.5
28	SKNK 129	252.0	8.7	2.2	257.0	33.0	7.8
29	SKNK 130	171.0	6.3	1.4	221.0	29.3	7.0
30	SKNK 131	193.0	6.7	1.5	215.0	28.0	7.5
31	SKNK 132	167.0	6.0	1.3	221.0	27.7	7.0
32	SKNK 133	137.0	4.3	1.1	244.0	27.7	7.3
33	SKNK 134	71.0	4.0	0.7	168.0	24.7	6.8
34	SKNK 135	55.0	2.0	0.3	170.0	22.3	7.1
35	SKNK 136	230.0	2.7	1.0	368.0	27.7	8.2
36	SKNK 138	126.0	4.7	2.1	452.0	35.7	8.2
37	SKNK 140	184.0	4.7	1.4	303.0	29.3	8.3
	Minimum	35.0	2.0	0.2	88.0	20.3	5.7
	Maximum	275.0	8.7	2.2	452.0	35.7	8.3
	Mean	130.4	4.5	0.9	199.0	25.9	7.1
	SD	66.6	1.6	0.5	75.6	3.4	0.7
	CV(%) Phenotypic	51.1	36.4	57.4	38.0	13.1	9.3

Table 119. Promising lines in Tumba germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
Mandor (Accessions 50)			
1.	Seed yield (q/ha)	39.0-756.0	RMT 516, RMT 515, RMT 502, RMT 513, RMT 509 > (4.5 q/ha)
2.	No. of fruits per plant	1.3-20.7	RMT 516, RMT 502, RMT 509, RMT 515, RMT 501 > (13.0)
3.	Fruit yield per plant (kg)	0.20-4.10	RMT 516, RMT 515, RMT 502, RMT 501, RMT 509 > (2.35 kg)
4.	Single fruit weight (g)	47.0-261.0	RMT 515, RMT 524, RMT 516, RMT 519, RMT 501 > (185.0 g)
5.	Fruit circumference (cm)	19.0-29.7	RMT 512, RMT 516, RMT 509, RMT 524, RMT 515 > (25.0 cm)
6.	100 seed weight (g)	3.5-4.3	RMT 522, RMT 527, RMT 525, RMT 510, RMT 503 > (4.0 g)

Table 120. Evaluation of germplasm lines in Tumba at Mandor – Plains (2005)

S. No.	Entry	Seed yield (kg/ha)	No. of fruits/plant	Fruit yield/ plant(kg)	Single fruit weight (g)	Fruit circumference (cm)	100-seed weight (g)
1	RMT 501	456.00	14.00	2.63	188.00	24.00	4.00
2	RMT 502	533.00	18.00	2.73	152.00	20.70	3.70
3	RMT 503	106.00	4.70	0.70	150.00	21.70	4.20
4	RMT 505	122.00	12.00	1.43	119.00	21.30	3.80
5	RMT 509	489.00	16.00	2.37	148.00	28.00	3.70
6	RMT 510	67.00	5.00	0.23	47.00	19.30	4.30
7	RMT 511	222.00	9.70	0.73	76.00	25.70	4.10
8	RMT 512	344.00	12.30	1.90	154.00	29.70	3.80
9	RMT 513	533.00	13.30	1.83	138.00	24.00	3.90
10	RMT 514	311.00	11.70	1.50	129.00	24.30	4.00
11	RMT 515	694.00	15.30	4.00	261.00	26.70	4.00
12	RMT 516	756.00	20.70	4.10	198.00	28.30	3.80
13	RMT 518	39.00	1.30	0.20	150.00	19.00	4.00
14	RMT 519	378.00	9.30	1.77	189.00	21.50	3.90
15	RMT 520	350.00	8.30	1.23	148.00	22.00	3.90
16	RMT 521	283.00	9.30	1.57	168.00	22.00	4.00
17	RMT 522	261.00	6.70	1.10	165.00	22.70	4.30
18	RMT 523	111.00	5.70	0.57	100.00	23.00	3.60
19	RMT 524	278.00	7.00	1.73	248.00	27.00	3.50
20	RMT 525	150.00	7.70	0.93	122.00	22.00	4.30
21	RMT 526	72.00	3.00	0.33	111.00	20.00	4.10
22	RMT 527	300.00	11.30	1.37	121.00	22.30	4.30
	Range	39-756	1.3-20.7	0.20-4.10	47-261	19.0-29.7	3.5-4.3
	Mean	311.60	10.10	1.60	149.20	23.40	4.00
	SD	201.20	4.90	1.10	49.30	3.00	0.20

Table 121. Promising lines in Jatropha germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
S.K. Nagar (Accessions 48)			
1.	Plant height (cm)	112.45-151.26	CSMRCI-7, SKNJ-1, Chattarpati, Koteswar > (142.0 cm)
2.	No. of branches	5.32-8.17	Ranpur, Kumbharia, SKNJ-10, CSMCI-8, Koteswar > (7.0)
3.	Stem girth (cm)	19.53-27.60	CSMCRI-7, CSMCRI-8, Urlikanchan > (23.0 cm)
HAU, Hisar (Accessions 11)			
1.	Plant height (cm)	95.0-214.0	JH-2, SKN (Big) > (180.0 cm)
2.	Days to flowering	273.0-285.0	Chhattarpati, JH-2, Urlikanchan < (275.0 days)
3.	No. of branches	2.0-5.0	Phoole-J-1, JH-2 (4.0)
4.	Stem girth (cm)	10.0-19.8	JH-2, SKN (Big) > (16.3 cm)

Table 122. Evaluation of germplasm lines in Jatropha at S.K. Nagar – Plains (2005)

S. No.	Genotypes	Plant height (cm)	No. of branches	Stem girth (cm)
1	Koteshwar	142.28	7.51	23.47
2	Ranpur	124.79	8.17	22.13
3	Pancha	127.50	7.41	23.37
4	Ambaji	125.53	6.23	21.50
5	Kumbharia	141.62	8.05	22.87
6	CSMCRI-1	126.27	5.46	21.20
7	CSMCRI-2	112.45	5.97	21.00
8	CSMCRI-3	140.99	6.95	21.80
9	CSMCRI-4	123.64	5.32	21.60
10	CSMCRI-5	136.79	6.92	23.00
11	CSMCRI-6	129.08	6.77	22.67
12	CSMCRI-7	151.26	7.44	27.60
13	CSMCRI-8	132.15	7.74	24.33
14	CSMCRI-9	127.05	6.96	21.53
15	CSMCRI-10	134.53	6.52	22.67
16	SKNJ-1	139.54	6.94	22.17
17	SKNJ-2	147.40	7.33	21.50
18	SKNJ-7	127.76	5.64	20.83
19	SKNJ-8	138.21	6.46	21.73
20	SKNJ-9	126.90	5.81	22.27
21	SKNJ-10	135.32	7.76	22.63
22	SKNJ-11	125.67	5.69	21.07
23	SKNJ-12	141.34	6.55	22.03
24	SKNJ-13	137.10	7.25	21.73
25	SKNJ Big	127.21	7.01	22.77
26	Hansraj	134.27	6.46	23.03
27	Urlikanchan	123.64	6.57	23.60
28	Chatrapati	142.80	7.09	19.53
	GM	132.97	6.79	22.34
	EMS	133.66	1.09	8.24
	CV%	8.69	15.36	12.85
	SE	9.44	0.85	2.34
	CD 5%	18.50	1.67	4.59

Table 123. Evaluation of germplasm lines in Jatropha at Hisar – Plains (2005)

S.No.	Genotype	Days to 50% flowering	Plant height (cm)	Branches/plant	Girth at the base (cm)
1	Phoole J-1	280.00	165.00	5.00	15.30
2	ISJ-1	283.00	130.00	4.00	13.00
3	Hisar Local-3	285.00	122.00	2.00	10.70
4	SKNJ-4	285.00	95.00	2.00	10.00
5	Hisar Local-2	280.00	125.00	3.00	12.00
6	JH-1	275.00	120.00	2.00	11.00
7	Hansraj	278.00	180.00	3.00	16.00
8	SKN (Big)	279.00	185.00	2.00	17.00
9	Chhattarpati	273.00	159.00	3.00	14.00
10	Urlikanchan	273.00	158.00	3.00	16.30
11	JH-2	273.00	214.00	5.00	19.80
	Minimum	273.00	95.00	2.00	10.00
	Maximum	285.00	214.00	5.00	19.80
	Mean	278.55	150.27	3.09	14.10
	SD	4.61	35.11	1.14	3.07
	CV (%)	1.66	23.36	36.76	21.79

Table 124. Promising lines in Simarouba germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
Rahuri (Accessions 27)			
1.	Plant height (cm)	0.50-2.66	B-1, M-8, M3, M-9, M-13 > (2.0 cm)
2.	No. of branches per plant	0.0-12.0	M3, M4, M-1(male), M-8, M-12 > (9.0)
3.	Stem girth (cm)	4.0-33.0	M-12, M-13, M-11(male), M3, M-8 > (20.0 cm)
4.	Diameter of plant (cm)	25.0-180.0	M-11(male), M-13, M-9, M-5, M-8 > (120.0 cm)
Bhubaneswar (Accessions 13)			
1.	Plant height (cm)	30.3-48.0	B-Simarouba 7, B-Simarouba 2, B-Simarouba 5, B-Simarouba 9, B-Simarouba 12 > (45.0 cm)
2.	Girth at base (cm)	4.0-5.0	B-Simarouba 7, B-Simarouba 5, B-Simarouba 4, B-Simarouba 10, B-Simarouba 6, B-Simarouba 3 > (4.0 cm)
Mandor (Accessions 27)			
1.	Plant height (m)	4.20-6.40	Plant No. 1, Plant No. 4 > (6.10 m)
2.	Plant canopy length (m)	3.70-6.00	Plant No. 1, Plant No. 3 > (5.40 m)
3.	Plant canopy width (m)	3.90-5.90	Plant No. 3, Plant No. 1 > (4.75 m)
4.	Girth (cm)	40.0-60.0	Plant No. 3, Plant No. 1 > (53.0 cm)
5.	Seed yield per plant (g)	95.0-690.0	Plant No. 1, Plant No. 4 > (130.0 g)
6.	100 seed weight (g)	74.0-100.40	Plant No. 1, Plant No. 4 > (82.8 g)

Table 125. Evaluation of germplasm lines in Simarouba at Rahuri – Plains (2005)

S. No.	Plant No	Plant height (m)	No. of branches /plant	Stem girth (cm)	Diameter of plant (cm)
1	M-1	2.00	5.00	19.00	80.00
2	M-1(male)	2.30	11.00	17.00	83.00
3	M3	2.64	12.00	21.00	110.00
4	M4	2.40	12.00	20.00	74.00
5	M-5	2.00	8.00	19.00	160.00
6	M-6	2.20	7.00	15.00	83.00
7	M-7	1.80	8.00	15.00	83.00
8	M-8	2.66	10.00	21.00	125.00
9	M-9	2.50	7.00	20.00	160.00
10	M10	1.55	6.00	11.00	60.00
11	M-11(male)	2.30	7.00	22.00	180.00
12	M-12	2.10	10.00	33.00	120.00
13	M-13	2.50	9.00	25.00	160.00
14	M-14	0.70	0.00	8.00	30.00
15	M-15	1.80	6.00	20.00	110.00
16	B-1	.0.70	1.00	7.00	35.00
17	B-2	1.30	5.00	10.00	50.00
18	B-3	1.10	5.00	9.00	35.00
19	B-4	0.50	0.00	4.00	25.00
20	B-5	0.70	1.00	7.00	40.00
21	B-6	0.50	0.00	4.00	30.00
22	B-7	0.70	4.00	9.00	33.00
23	B-8	0.70	0.00	7.00	33.00

S. No.	Plant No	Plant height (m)	No. of branches /plant	Stem girth (cm)	Diameter of plant (cm)
24	B-9	0.57	0.00	5.00	35.00
25	B-10	1.30	7.00	12.00	53.00
26	B-11	1.50	3.00	10.00	55.00
27	B-12	1.10	4.00	9.00	40.00
	Minimum	0.50	0.00	4.00	25.00
	Maximum	2.66	12.00	33.00	180.00
	Mean	1.59	5.48	14.04	77.11
	SD	0.74	3.89	7.33	47.57
	CV(%)	46.75	70.90	52.22	61.69

Table 126. Evaluation of germplasm lines in Simarouba at Bhubaneswar – Plains (2005)

Sl. No.	Name of the Cultivar	Plant ht.(cm)	Girth at base(cm)
1	B-Simarouba 1	37.0	4.3
2	B-Simarouba 2	47.0	4.7
3	B-Simarouba 3	35.0	5.0
4	B-Simarouba 4	43.3	5.0
5	B-Simarouba 5	46.3	5.0
6	B-Simarouba 6	41.3	5.0
7	B-Simarouba 7	48.0	5.0
8	B-Simarouba 8	42.3	4.8
9	B-Simarouba 9	45.7	4.0
10	B-Simarouba 10	43.0	5.0
11	B-Simarouba 11	30.3	4.0
12	B-Simarouba 12	45.3	4.7
13	B-Simarouba 13	36.7	4.7
	Minimum	30.3	4.0
	Maximum	48.0	5.0
	Mean	41.6	4.7
	SD	5.36	0.38
	CV (%)	12.87	7.97

Table 127. Evaluation of germplasm lines in Simarouba at Mandor – Plains (2005)

S. No.	Plant No.	Height (m)	Plant No.	Plant canopy length (m)	Plant No.	Plant canopy width (m)	Plant No.	Girth (m)	Plant No.	Seed yield/Plant (g)	Plant No.	100seed weight (g)
1	1	6.40	1.00	6.00	3.00	5.90	3.00	0.60	4.00	690.00	3.00	82.8.
2	4	6.20	3.00	5.90	1.00	5.80	1.00	0.56	3.00	250.00	1.00	100.40
3	3	6.10	2.00	5.40	2.00	4.75	4.00	0.53	1.00	130.00	4.00	93.20
4	2	4.60	4.00	4.75	4.00	4.60	2.00	0.50	2.00	100.00	2.00	80.80
5	5	4.20	5.00	3.70	5.00	3.90	5.00	0.40	5.00	95.00	5.00	74.00
	Minimum	4.20	1.00	3.70	1.00	3.90	1.00	0.40	1.00	95.00	1.00	74.00
	Maximum	6.40	5.00	6.00	5.00	5.90	5.00	0.60	5.00	690.00	5.00	100.40
	Mean	5.50	3.00	5.15	3.00	4.99	3.00	0.52	3.00	253.00	3.00	87.10
	SD	1.02	1.58	0.95	1.58	0.85	1.58	0.08	1.58	252.23	1.58	11.91
	CV (%)	18.54	52.70	18.45	52.70	17.01	52.70	14.60	52.70	99.70	52.70	13.67

QUALITY ANALYSIS

IV. QUALITY ANALYSIS

The seed of promising genotypes evaluated in AVT and IVT of the nine underutilized crops from seven centres were planned for quality analysis, but due to non availability of the seed from the centres, quality analysis was done only in five underutilized crops supplied by the five centres. The crop-wise details of quality traits are given below:

4.1 Faba bean

4.1.1 AVT on Fababean, Hisar:

Seeds of 11 genotypes from Hisar centre were analysed for moisture, ash, protein and vicine – convicine content (Table 128). Moisture content varied from 9.6 to 10.7 per cent and ash content varied from 0.87 to 0.96 per cent with the average value of 9.90 and 0.92 percent respectively. Protein and vicine – convicine content varied from 22.8 to 25.2 per cent and 0.76 to 0.98 with an average of 24.4 and 0.83 per cent respectively.

The promising genotypes having high protein content, high ash content and low in vicine – convicine content are given below:

Genotypes	Protein (%)	Genotypes	Vicine convicine (%)	Genotypes	Ash content (%)
HB- 518	25.2	HB- 303	0.76	HB- 516	0.96
HB- 430	24.8	NDF- 1	0.78	BSH- 42	0.95
HB- 516	24.8	HB- 516	0.78	HB - 202	0.95
NDF-1	24.7	HB- 405	0.79	Vikrant	0.95
Vikrant	24.8	Vikrant	0.87		

4.1.2 Progeny Row Trial (PRT) on Fababean, Hisar:

Seeds of twenty-three genotypes from Hisar centre were analysed for moisture, ash, protein and vicine – convicine content (Table 129) which ranged from 9.9 to 11.6, 0.78 to 1.45, 21.5 to 26.0 and 0.71 to 0.99 per cent with the mean value of 10.7, 1.01, 24.0 and 0.83 per cent respectively. The promising genotypes are given below:

Genotypes	Protein (%)	Genotypes	Vicine-convicine (%)	Genotypes	Ash content (%)
PRT- 15	26.0	PRT- 6	0.71	PRT-7	1.45
PRT-13	25.8	PRT- 11	0.73	PRT-10	1.30
PRT- 18	25.8	PRT- 9	0.73	PRT-15	1.21
PRT-7	25.4	PRT- 12	0.75	PRT-14	1.15

4.1.3 Station trial on Fababean, Hisar:

Seeds of thirty genotypes from Hisar centre were analysed for moisture, ash, protein and vicine – convicine content (Table 130) which ranged from 8.8 to 12.4, 0.65 to 1.4, 22.1 to 26.7 and 0.75 to 0.98 per cent with the mean value of 10.2, 1.01, 24.5 and 0.85 per cent respectively. The promising genotypes are given below:

Genotypes	Protein (%)	Genotypes	Vicine-convicine (%)	Genotypes	Ash content (%)
ST- 65	26.7	ST- 42	0.75	ST- 49	12.4
ST-57	26.7	ST-11	0.76	ST-11	11.5
ST-56	26.2	ST-56	0.77	ST-45	11.3
ST-50	26.2	ST-59	0.77	ST-61	11.2
		ST- 64	0.77		

4.1.4 Germplasm Evaluation Trial on Fababean, Hisar:

Seeds of fifty-three genotypes from Hisar centre were analysed for moisture, ash, protein and vicine – convicine content (Table 131) which ranged from 9.6 to 11.4, 0.82 to 1.51, 20.0 to 26.8 and 0.72 to 1.20 per cent with the mean value of 10.7, 1.18, 24.7 and 0.88 per cent respectively. The promising genotypes are given below:

Genotypes	Protein (%)	Genotypes	Vicine-convicine (%)	Genotypes	Ash content (%)
EC-322967	26.8	GP- 3	0.72	IC-361490	1.51
EC-25085	26.7	EC-108742	0.72	EC-329609	1.51
EC-374731	26.6	EC-243588	0.73	EC-117749	1.50
EC-243743	26.6	IC-331571	0.73	IC-361497	1.49

4.1.5 Fababean (Developing seeds and Pods), Solan:

Developing seeds and blank pods of nineteen genotypes of fababean from Hill centre, Solan were analysed for protein and vicine – convicine content. In the immature seeds protein content ranged from 24.9 to 28.9 per cent and vicine – convicine content from 1.02 to 1.35 per cent with the mean value of 26.7 and 1.19 per cent respectively (Table 132). In the blank developing pods protein content ranged from 7.4 to 13.1 per cent and vicine – convicine content from 0.19 to 0.43 per cent with an average value of 9.8 and 0.32 per cent respectively. The promising genotypes are given below:

Genotypes	Developing seeds			Developing blank pods			
	Protein (%)	Genotypes	Vicine-convicine (%)	Genotypes	Protein (%)	Genotypes	Vicine-convicine (%)
HB-430	28.9	HB-131	1.02	HB-509	13.1	HB-504	0.19
HB-123	28.7	PRT-7	1.02	Fababean var. local	12.4	HB-115	0.21
HB-115	28.5	Fababean var. local	1.03	HB-405	12.0	PRT-12	0.21
Fababean	28.5	HB-521	1.04	HB-430	11.4	HB-123	0.22

4.2 Grain amaranth

4.2.1 Grain amaranth, S.K. Nagar:

Seeds of nine genotypes of grain amaranth were analysed for protein, lysine and starch content (Table 133). Protein content ranged from 11.4 to 14.2 (%), lysine content from 4.2 to 5.4 (%) and starch from 56.8 to 62.4 (%) with an average value of 12.8%, 4.9 g/16 g N and 59.6 % respectively. The promising genotypes as following:

Genotypes	Protein (%)	Genotype	Lysine (g/16 g N)	Genotypes	Starch (%)
BGA-7	14.2	MGA-2	5.3	GA-2	62.4
GA-2	13.7	SKNA-21	5.2	RMA-4	61.1
SKNA-21	13.3	RMA-3	5.1	RMA-3	61.2
Annapurna (C)	12.2	Annapurna (C)	5.4	Annapurna (C)	62.1

4.2.2 AVT on grain amaranth, Shimla:

Seeds of thirteen genotypes were analysed for protein, lysine, starch, oil content and its fatty acid composition. Protein, lysine, starch and oil content varied from 13.1 to 15.0, 4.8 to 5.6, 55.8 to 61.8 and 8.2 to 11.2 per cent, with an average value of 14.1, 5.18, 58.9 and 9.1 percent respectively (Table 134). For fatty acid composition Oleic and Linoleic acids are considered beneficial for health. The promising genotypes as following:

Genotypes	Protein (%)	Genotypes	Lysine (g/16g N)	Genotypes	Starch (%)
PRA-2	15.0	PRA-9401	5.6	PRA-2000	61.8
Shimla A-5	14.7	Shimla A-1	5.5	PRA-9801	60.9
PLP-1	14.7	PRA-9801	5.4	PRA-2	60.2
PRA-2000	14.6	Sangla A-1	5.4	Annapurna (C)	57.2
Annapurna (C)	13.9	Annapurna (C)	5.4		

Genotypes	Oil (%)	Genotypes	Oleic Acid (% in oil)	Genotypes	Linoleic acid (% in oil)
Shimla A-2	11.2	PLP-1	28.9	Shimla A-6	41.9
IC-35407	10.5	IC-35407	27.2	PRA -2	41.9
PRA-9101	10.1	Shimla A-2	21.3	PRA -9801	41.4
Shimla A-1	9.7	Annapurna (C)	19.4	Annapurna (C)	41.2
Annapurna (C)	8.3				

4.3 Tumba

4.3.1 IVT on Tumba, Mandore:

Seed oil of twelve genotypes of Tumba were analysed for its palmitic, stearic, oleic, linoleic and linolenic acid which ranged from 5.9 to 12.5, 5.0 to 10.5, 9.8 to 18.1, 37.3 to 53.6 and 2.1 to 5.4 % having an average value of

8.8, 6.6, 14.9, 44.1 and 3.6% respectively (Table 135). The promising genotypes with good oil quality were:

Genotypes	Oleic acid	Genotypes	Linoleic acid	Genotypes	Linolenic acid
RMT-161	18.1	RMT-142	53.6	RMT-144	5.4
RMT-31	17.7	RMT-172	49.8	RMT-3	4.5
RMT-84	17.2	RMT-161	46.6	RMT-45	4.4
RMT-27	17.1	RMT-225	46.6	RMT-233	4.3
RMT-172	17.3	RMT-27	46.4	RMT-290	4.0

4.4 Buck wheat

4.4.1 AVT on Buckwheat, Ranichauri.:

Seeds of ten genotypes were analysed for mineral content (Table 136). Fe, Zn, Ni, Mn and Cu ranged from 9.04 to 40.9, 2.72 to 5.14, 5.66 to 12.86, 0.27 to 3.94 and 0.03 to 1.91 mg/100 g with an average value of 18.6, 3.86, 8.39, 1.75 and 1.14 mg/100g respectively. The promising genotypes were:

Genotypes	Fe (mg/100g)	Genotypes	Zn (mg/100g)	Genotypes	Ni (mg/100g)	Genotypes	Mn (mg/100g)	Genotypes	Cu (mg/100g)
Himpriya (C)	40.90	Sangla B-7	5.14	PRB-9001-1	12.86	Himpriya (C)	3.94	Sangla B-2	1.91
Sangla B-7	27.36	Sangla B-5	4.99	Sangla B-1	12.23	KBB-3	3.03	Himpriya (C)	1.77
Sangla B-5	21.96	V L-7	4.81	PRB-1	8.88	V L-7	2.07	Sangla B-1	1.50
V L-7	16.22	Himpriya (C)	4.44	Himpriya (C)	6.23	PRB-9001-1	2.10	Sangla B-5	1.23

4.4.2 AVT on Buckwheat, Shimla:

Grains of eight genotypes of buckwheat were analysed for protein, available lysine, starch, methanol extract and total free phenols which ranged from 12.0 to 14.5 (%), 4.1 to 5.3 (g/16g N), 77 to 81 (%), 5.3 to 10.2 (%) and 0.70 to 0.95 (%) respectively. The average value were 13.01, 4.75, 78.88, 73.0 and 0.81% respectively (Table 137). The promising genotypes were:

Genotypes	Protein (%)	Genotypes	Available lysine (g/16g N)	Genotypes	Methanol extract (%)	Genotypes	Total free phenols (%)
Sangla B3	14.5	Sangla B7	5.3	Shimla B2	10.2	KBB 1	0.95
KBB 1	13.7	Sangla B2	5.2	Sangla B7	7.6	Sangla	0.85
Sangla B6	13.1	Sangla B1	5.1	Sangla B3	7.4	Sangla	0.83
Sangla B2	13.0			SanglaB2	7.2	Shimla B2	0.83

4.5 Chenopodium

4.5.1 AVT on Chenopodium, Ranichauri:

Seeds of nine genotypes of Chenopodium were analysed for Fe, Zn, Ni, and Mn content which ranged from 15.97 to 38.19, 3.10 to 5.25, 13.09 to 29.71 and 0.16 to 0.79 with an average value of 30.10, 4.30, 19.36 and 0.41 mg /100g, respectively (Table 138). The promising genotypes were:

Genotypes	Fe (mg/100g)	Genotypes	Zn (mg/100g)	Genotypes	Ni (mg/100g)	Genotypes	Mn (mg/100g)
PRC-9805	38.19	PRC-9807	5.25	PRC-9805	29.71	PRC-9801	0.79
PRC-9807	36.57	PRC-9802	4.87	CHLKW-8	25.79	PRC-9807	0.60
PRC-9802	36.24	CHLKW-6	4.79	PRC-9802	22.79	PRC-9802	0.58
PRC-9801	33.34	CHLKW-5	4.59	CHLKW-9	22.08	CHLKW-5	0.49

Table 128. AVT on Fababean (Hisar)

Sr. No.	Genotypes	Moisture (%)	Ash (%)	Protein (%)	Vicine Convicine (%)
1	NDF-1	10.1	0.90	24.7	0.78
2	Vikrant	9.7	0.95	24.8	0.87
3	HB-202	9.9	0.95	24.4	0.83
4	HB-405	9.6	0.91	24.1	0.79
5	HB-518	9.7	0.92	25.2	0.88
6	BSH-42	10.1	0.95	24.3	0.98
7	ISV-10-2	9.9	0.87	24.2	0.83
8	HB-430	9.9	0.93	24.8	0.81
9	HB-420	10.1	0.88	24.3	0.85
10	HB-516	10.1	0.96	24.8	0.78
11	HB-303	10.7	0.90	22.8	0.76
	Mean	9.9	0.92	24.4	0.83
	Range	9.6-10.7	0.87-0.96	22.8-25.2	0.76-0.98

Table 129. Progeny Row Trial – Fababean (Hisar)

S.No.	Genotypes	Moisture (%)	Ash (%)	Protein (%)	Vicine Convicine (%)
1	PRT-10	10.1	1.30	24.9	0.79
2	PRT-8	11.6	0.81	22.9	0.77
3	PRT-18	10.5	1.07	25.8	0.98
4	PRT-4	11.4	0.82	22.9	0.81
5	PRT-13	10.5	1.08	25.8	0.99
6	PRT-9	11.3	0.82	22.5	0.73
7	PRT-12	9.9	1.14	24.8	0.87
8	PRT-20	11.0	0.83	23.7	0.78
9	PRT-1	10.4	1.12	25.4	0.92
10	PRT-11	11.4	0.90	22.2	0.73
11	PRT-4	10.0	1.18	25.8	0.87
12	PRT-2	11.3	0.82	22.3	0.75
13	PRT-15	10.0	1.21	26.0	0.92
14	PRT-5	11.5	0.81	22.1	0.77
15	PRT-7	10.0	1.09	25.7	0.87
16	PRT-6	11.6	0.78	21.5	0.71
17	PRT-16	10.0	1.08	25.6	0.93
18	PRT-19	11.4	0.79	22.0	0.77
19	PRT-14	10.1	1.15	25.1	0.91
20	PRT-3	11.8	0.82	21.7	0.75
21	PRT-17	10.0	1.12	24.7	0.81
22	PRT-7	10.5	1.45	25.4	0.87
23	PRT-12	10.8	1.07	23.4	0.75
	Mean	10.7	1.01	24.0	0.83
	Range	9.9-11.6	0.78-1.45	21.5-26.0	0.71-0.99

Table 130. Station trial – Fababean (Hisar)

Sr. No.	Genotypes	Moisture (%)	Ash (%)	Protein (%)	Vicine Convicine (%)
1	ST-46	9.8	0.89	24.6	0.81
2	ST-44	10.1	0.98	24.6	0.85
3	ST-63	9.7	0.91	25.0	0.83
4	ST-66	10.1	0.88	24.0	0.81
5	ST-47	10.0	0.92	24.1	0.82
6	ST-43	10.1	0.91	24.6	0.78
7	ST-57	8.8	1.30	26.7	0.87
8	ST-64	9.9	0.90	24.0	0.77
9	ST-40	8.9	1.33	26.0	0.98
10	ST-46	10.3	0.91	24.6	0.92
11	ST-49	12.4	0.65	25.8	0.95
12	ST-51	10.2	0.89	24.4	0.78
13	ST-55	10.1	0.92	25.1	0.94
14	ST-56	10.8	0.85	23.0	0.77
15	ST-58	10.2	9.93	24.4	0.83
16	ST-52	10.1	0.90	24.7	0.79
17	ST-54	10.2	0.80	22.1	0.78
18	ST-65	9.2	1.38	26.7	0.92
19	ST-47	10.1	1.01	24.4	0.82
20	Vikrant	9.3	1.28	26.3	0.87
21	ST-59	10.7	0.87	23.5	0.77
22	ST-56	9.3	1.23	26.2	0.81
23	ST-42	10.3	0.82	22.6	0.75
24	ST-50	9.2	1.13	26.2	0.89
25	ST-60	9.4	1.20	26.1	0.93
26	ST-45	11.3	0.91	23.5	0.84
27	ST-93	10.6	1.4	26.0	0.98
28	ST-44	11.1	0.95	24.2	0.91
29	ST-61	11.2	1.32	25.9	0.88
30	ST-11	11.5	1.02	24.3	0.76
	Mean	10.2	1.01	24.5	0.85
	Range	8.8-12.4	0.65-1.4	22.1-26.7	0.75-0.98

Table 131. Germplasm Evaluation Trial on Fababean (Hisar)

S. No.	Genotypes	Moisture (%)	Ash (%)	Protein (%)	Vicine Convicine (%)
1	GP-5	10.8	1.39	26.5	0.98
2	GP-3	11.4	0.94	23.3	0.72
3	EC-243709	10.6	1.40	26.0	0.89
4	EC-243755	11.1	1.03	24.2	0.74
5	EC-25085	10.7	1.36	26.7	0.88
6	EC-243764	11.0	1.03	21.9	0.75
7	IC-361438	10.5	1.41	24.2	0.78
8	EC-243588	10.9	1.01	23.7	0.73
9	IC-361490	10.6	1.51	26.5	1.04
10	EC-251014	11.1	0.93	24.5	0.83
11	IC-361497	10.5	1.49	25.2	0.88
12	EC-343691	10.7	1.16	23.1	0.74
13	EC-329631	11.2	1.02	24.5	0.78
14	EC-296730	10.7	1.37	25.8	0.81
15	IC-361426	10.7	1.31	25.9	0.92
16	EC-7853	10.7	1.24	22.5	0.78
17	IC-247646	10.6	1.37	25.9	1.02
18	EC-248945	10.6	1.17	23.4	0.78
19	IC-361498	10.6	1.34	25.9	0.85
20	BLMKS-7	11.3	0.91	22.2	0.77
21	EC-329609	9.6	1.51	25.2	0.98
22	EC-354954	10.5	1.39	25.1	1.02
23	EC-117720	11.0	1.00	24.0	0.93
24	EC-329708	10.5	1.34	26.6	1.07
25	EC-248710	11.0	1.01	24.2	0.87
26	IC-331571	10.6	1.36	20.0	0.73
27	EC-329627	11.3	0.87	22.4	0.79
28	EC-248952	10.8	1.26	26.8	1.05
29	EC-108742	11.1	0.82	22.8	0.72
30	EC-322967	10.7	1.37	26.8	1.08

S. No.	Genotypes	Moisture (%)	Ash (%)	Protein (%)	Vicine Convicine (%)
31	EC-329003	10.8	1.06	24.7	0.78
32	EC-267640	10.6	1.35	25.9	0.87
33	EC-329648	11.1	0.98	24.4	0.86
34	EC-243820	10.7	1.34	26.5	1.12
35	EC-329675	10.7	1.04	22.3	0.75
36	EC-351999	10.4	1.30	25.9	0.81
37	EC-243626	11.0	0.92	23.3	0.78
38	EC-243743	10.3	1.49	26.6	1.08
39	EC-25.3529	10.7	1.05	24.5	0.97
40	EC-267639	10.6	1.20	25.9	0.98
41	GP-6	10.7	1.07	24.5	0.77
42	EC-249947	10.6	1.33	26.4	1.13
43	VH-82-1	11.1	1.03	24.1	0.87
44	EC-117784	10.6	1.39	26.5	1.15
45	EC-379728	10.7	1.02	24.0	0.88
46	EC-117734	10.3	1.33	25.8	0.81
47	GP-2	11.0	0.99	23.5	0.75
48	EC-374731	10.5	1.37	26.6	1.20
49	EC-117727	10.9	1.00	23.7	0.78
50	EC-117749	10.0	1.50	26.0	1.01
51	R-54-05 No. - 12	9.9	1.06	24.8	0.85
52	R-54-05 No. - 8	10.1	1.03	24.6	0.89
53	R-04-05 No. - 18	10.4	1.00	23.8	0.83
	Mean	10.4	1.18	24.7	0.88
	Range	9.6-11.4	0.82-1.51	20.0-26.8	0.72-1.20

Table 132. Quality analysis in fababean (Developing Seeds and Pods) from Solan (Hill)

Sr. No.	Genotypes	Immature seeds		Developing Pods	
		Protein (%)	Vicine convicine (%)	Protein (%)	Vicine convicine (%)
1.	PRT-7	24.9	1.02	8.8	0.37
2.	HB-521	25.4	1.04	7.5	0.39
3.	HB-193	26.3	1.22	11.2	0.38
4.	HB-43	26.8	1.27	9.6	0.27
5.	PRT-12	26.3	1.35	9.1	0.21
6.	HB-405	25.9	1.31	12.0	0.25
7.	HB-131	24.9	1.02	7.4	0.33
8.	HB-428	25.4	1.17	9.8	0.41
9.	Vikrant	26.4	1.28	9.6	0.43
10.	NDF-7	27.1	1.32	10.5	0.41
11.	BSH-9	25.2	1.10	8.2	0.27
12.	HB-180	26.8	1.22	9.1	0.33
13.	HB-430	28.9	1.11	11.4	0.43
14.	Fababean var. Local	28.5	1.03	12.4	0.39
15.	HB-123	28.7	1.14	9.3	0.22
16.	HB-115	28.5	1.27	8.8	0.21
17.	VH-82-1	27.7	1.32	10.3	0.35
18.	HB-504	27.1	1.21	7.9	0.19
19.	HB-509	25.7	1.17	13.1	0.29
	Mean	26.7	1.19	9.8	0.32
	Range	24.9-28.9	1.02-1.35	7.4-13.1	0.19-0.43

Table 133. Quality analysis in Grain amaranth trial, AVT (S.K. Nagar)

Genotype	Protein (%)	Lysine (g/16 gN)	Starch (%)
SKNA -21	13.3	5.2	56.8
BGA-7	14.2	4.7	58.2
BGA-3	13.9	4.8	57.1
RMA-3	11.7	5.1	60.2
RMA-4	12.1	4.2	61.1
MGA-2	11.4	5.3	59.8
GA-2	13.7	4.5	62.4
Sauverna	13.1	5.1	58.9
Annapurna	12.2	5.4	62.1
Mean	12.8	4.9	59.6
Range	11.4-14.2	4.2-5.4	56.8-62.4

Table 134. Quality analysis in Grain Amaranth, AVT, Shimla centre.

S. No.	Genotypes	Protein (%)	Lysine (g/16gN)	Starch (%)	Oil (%)	Palmitic Acid (6:0)	Stearic acid (18:0)	Oleicacid (18:1)	Linoleic acid (18:2)	Linolenic acid (18:3)
1	PRA-2000	14.6	4.8	61.8	8.7	17.9	2.9	20.9	40.0	1.0
2	PRA-2	15.0	4.9	60.2	9.1	18.9	2.8	19.1	41.9	1.0
3	PLP-1	14.7	5.2	59.2	8.6	18.2	2.7	28.9	34.5	0.9
4	PRA-9801	13.9	5.4	60.9	8.2	17.9	2.6	20.6	41.4	1.8
5	PRA-9101	14.0	5.1	59.2	10.1	17.9	2.4	15.1	39.0	1.2
6	Shimla A -6	14.1	4.8	58.2	8.4	19.8	3.8	22.5	41.9	1.0
7	Annapurna.	13.9	5.4	57.2	8.3	17.3	5.2	19.4	41.2	1.7
8	Shimla A-5	14.7	5.2	58.1	8.3	18.7	4.3	20.8	40.7	1.3
9	PRA-9401	13.6	5.6	60.2	8.8	15.2	6.6	16.9	34.9	4.6
10	Shimla A-1	13.5	5.5	58.3	9.7	15.5	3.6	17.4	36.6	1.6
11	SanglaA-1	13.9	5.4	59.8	8.5	16.6	4.9	20.5	39.6	1.0
12	ShimlaA-2	13.1	5.2	56.3	11.2	12.8	3.3	21.3	38.9	0.9
13	IC-35407	14.1	4.8	55.8	10.5	19.8	4.1	27.2	36.8	1.8
	Mean	14.1	5.18	58.9	9.1	17.4	3.8	20.8	39.0	1.5
	Range	13.1-15.0	4.8-5.6	55.8-61.8	8.2-11.2	12.8-19.8	2.4-6.6	15.1-28.9	34.5-41.9	0.9-4.6

Table 135. Quality analysis of Tumba (IVT) trial, Mandore Centre

Sr. No.	Genotypes	Palmitic acid (16:0)	Stearic acid (18:0)	Oleic acid (18:1)	Linoleic acid (18:2)	Linolenic acid (18:3)
1	RMT- 84	6.9	6.6	17.2	45.1	3.1
2	RMT - 27	9.3	6.5	17.1	46.4	2.6
3	RMT- 45	6.6	6.9	15.5	39.9	4.4
4	RMT- 144	6.8	5.3	14.8	39.7	5.4
5	RMT- 3	7.0	10.5	9.3	40.4	4.5
6	RMT- 31	6.3	5.1	17.7	37.3	2.4
7	RMT-255	12.0	5.6	15.2	46.6	3.4
8	RMT- 290	5.9	9.1	9.8	40.1	4.0
9	RMT- 233	8.9	5.0	12.2	44.2	4.3
10	RMT-172	12.5	5.9	16.3	49.8	3.1
11	RMT-161	11.9	6.0	18.1	46.6	3.8
12	RMT-142	11.4	6.2	15.3	33.6	2.1
	Mean	8.8	6.6	14.9	44.1	3.6
	Range	5.9-12.5	5.0-10.5	9.8 - 18.1	37.3-53.6	2.1-5.4

Table 136. Mineral content in Buckwheat : Ranichauri Centre

Sr. No.	Genotypes	Fe (mg/100g)	Zn (mg/100g)	Ni (mg/100g)	Mn (mg/100g)	Cu (mg/100g)
1	Sangla B-1	14.83	3.42	12.23	1.56	1.50
2	Sangla B-2	9.04	3.12	7.83	0.38	1.91
3	Sangla B-3	15.14	2.72	8.59	0.86	1.16
4	Himpriya	40.90	4.44	6.23	3.94	1.77
5	Sangla B-5	21.96	4.99	5.94	1.79	1.23
6	PRB-9001-1(KBB-3)	12.51	4.08	5.66	3.03	0.86
7	Sangla B-7	27.36	5.14	8.59	1.46	0.98
8	VL-7	16.22	4.81	7.11	2.07	0.84
9	PRB-9001-1	13.82	3.01	12.86	2.10	1.07
10	PRB-1	14.35	2.85	8.88	0.27	0.03
	Mean	18.6	3.86	8.39	1.75	1.14
	Range	9.04-40.9	2.72-5.14	5.66-12.86	0.27-3.94	0.03-1.91

Table 137. Quality analysis in Buckwheat (Seeds) : Shimla Centre

Sr. No.	Genotypes	Protein (%)	Available Lysine (g/16gN)	Starch (%)	Methanol extract (%)	Total Phenols (%)
1.	KBB – 1	13.7	4.1	79	7.0	0.95
2.	Sangla B ₂	13.0	4.6	80	7.2	0.85
3.	Sangla B ₃	14.5	4.2	77	7.4	0.70
4.	Sangla B ₁	12.3	5.1	78	5.3	0.80
5.	Sangla B ₅	12.8	4.8	79	6.8	0.83
6.	Sangla B ₆	13.1	4.7	78	6.9	0.73
7.	Sangla B ₇	12.0	5.3	81	7.6	0.80
8.	Shimla B ₂	12.7	5.2	79	10.2	0.83
Range		12.0-14.5	4.1-5.3	77-81	5.3-10.2	0.70-0.95
Mean		13.01	4.75	78.88	7.30	0.81

Table 138. Mineral content in Chenopodium, Ranichauri Centre

Genotypes	Fe(mg/100g)	Zn(mg/100g)	Ni(mg/100g)	Mn(mg/100g)
PRC-9801	33.34	4.36	16.39	0.79
PRC-9802	36.24	4.87	22.79	0.58
PRC-9805	38.19	3.99	29.71	0.44
PRC-9807	36.57	5.25	17.25	0.60
CHLKW-4	26.94	3.62	13.66	0.16
CHLKW-5	28.95	4.59	13.49	0.49
CHLKW-6	29.38	4.79	13.09	0.24
CHLKW-8	15.97	3.10	25.79	0.19
CHLKW-9	25.30	4.16	22.08	0.19
Mean	30.10	4.30	19.36	0.41
Range	15.97-38.19	3.10-5.25	13.09-29.71	0.16-0.79

CENTRE REPORT

V. CENTRE REPORT

5.1 HILLS

5.1.1 GBPUAT, Ranichauri

Grain Amaranth :

F₂ generation evaluation : Twenty eight crosses were evaluated in their F₂ generation along with parents. Ten plants per cross were observed. Mean flowering time of the crosses ranged from 57 to 72 days while mean seed yield ranged from 30.09 to 62.40 g/plant.

F₃ line evaluation : Twenty four crosses were evaluated in plant to progeny rows. Seed yield per plot ranged from 10.12 to 42.33 g. Flowering time (57 – 78 days) and maturity period (135 – 154 days) showed wide variation.

F₄ line testing : Superior F₄ lines of 13 crosses were tested for yield. Seed yield of the lines ranged from 92.70 to 805.80 g per plot. Flowering time ranged from 60 – 80 days.

F₅ yield testing : F₄ lines from 15 crosses were tested in a replicated trial. But the yield level of the entries was poor, in general.

F₆ yield testing : Superior lines were tested in a replicated trial. Seed yield of the entries was low ranging from 0.83 to 6.04 q/ha.

Station line trial : Ten entries were evaluated in a replicated trial. Yield level of the entries varied from 6.36 to 12.87 q/ha.

Rice bean:

F₁ generation : 30 crosses were evaluated along with their parents. Seed yield of the crosses varied from 11.55 to 21.80 g/plant. Flowering time (65.0 – 85.0 days) and maturity period (148.0 – 166.0 days) showed wide variation as compared to the parental checks.

F₂ generation : F₂ generation of 31 crosses was evaluated along with the check variety. Seed yield per plant ranged from 14.45 to 42.10 g. Flowering time varied from 60 to 78 days.

F₃ line evaluation : Seventy two F₃ lines of 24 crosses were evaluated in two row plots. Seed yield of the lines was quite low due to long maturity duration of the lines.

F₄ line evaluation : Eighty superior F₃ lines of 20 crosses were evaluated in three row plots along with parental checks. Seed yield per plot ranged from 14.10 to 52.85 g. Flowering and maturity period ranged from 69.0 – 85.0 days and 168.0 – 181.0 days, respectively.

F₅ line evaluation : 108 lines of 27 crosses were evaluated along with a check variety, PRR 1. Seed yield per plot ranged from 16.8 g to 44.50 g while flowering time ranged from 70.0 to 91.0 days and maturity from 161.0 to 190.0 days.

F₅ generation of narrow leaf plants : Narrow leafed, early maturing, determinate plants selected in F₂ generation were evaluated in progeny rows. Seed yield per plot was high and ranged from 32.70 to 188.40 g. Flowering time varied from 52.0 to 70.0 days and maturity period from 131.0 to 150.0 days.

F₆ yield trial : Selected superior lines were tested in a replicated trial along with two checks. Seed yield of the lines was low due to longer maturity duration and ranged from 1.89 to 4.13 q/ha.

Hybridization programme : New hybridization programme was undertaken to produce 15 single crosses. This included crosses with green seeds varieties also.

Buckwheat

Genotypic characterization : Twelve buckwheat genotypes were characterized for morphological and biochemical characters including electrophoresis of isozymes. The varieties showed significant variation with respect to the parameters studied.

5.2 PLAINS

5.2.1 OUAT, Bhubaneshwar

A mutation breeding programme on rice bean was conducted with 12 different genotypes including four national checks treated with 40 KR gamma rays and the required plants were selected in M₂ generation. In a hybridization program a total of seven rice bean varieties were used to make 15 crosses. The maximum percentage of success was observed with cross RBL6 x PRR-2 (80%)

5.2.2 PAU, Ludhiana

Studies for comparison of rice bean with moong and mash for grain yield were carried out with check varieties of moong (SML668), urd (Mash 338) and rice bean (RBL-6 and RBL-35). The result showed that the seed yield of rice bean variety RBL-6 (17.93 q/ha) was the highest followed by RBL-35 (17.18).

The varieties of rice bean was compared with six cowpea varieties for fodder yield. Cowpea entries were superior and produced three times fodder yield (98 kg/20 m² plot) as compared to rice bean (29 kg/plot).

5.2.3 UAS, Bangalore

Grain amaranth variety Suvarna was crossed with 10 other genotypes. Highest success was recorded with cross Suvarna x RGAS 92-10-1 (105 g) followed by Suvarna x IC32195 and Suvarna x IC35696. In rice bean crossing programme two national checks RBL-1 and RBL-6 were crossed with other 10 genotypes. The maximum success in seed set was observed with cross RBL-6 x LRB-452 followed by KHRB1 x LRB-198.

5.2.4 S.K. Nagar

A station trial on grain amaranth was carried out at S.K. Nagar with sixteen genotypes including three check variety. Early flowering was observed (32 days) in the genotype IC38045 while early maturity and flowering were observed with IC38353 (88, 33 days); IC38145 (93, 33 days); IC38131 (94, 33 days). Highest seed yield 27.36 q/ha was produced by the genotype IC38102 followed by IC38188 (26.84 q/ha).

Another station trial on grain amaranth was carried out at S.K. Nagar with sixteen genotypes including two checks GA-1 and GA-2. Most of the genotypes showed superiority over the check varieties. The highest seed yield (35.34 q/ha) was recorded with SKNA-18 followed by Somali (32.37 q/ha) while check varieties GA-1 and GA-2 produced 19.52 q/ha and 27.40 q/ha respectively. Early flowering (41 days) was observed with the genotype Laxmipur.

AGRONOMY

VI. AGRONOMY

Eleven agronomic experiments comprising five investigations on grain amaranth, four trials on rice bean and one study each on buckwheat, and Jatropha were conducted at eight centres of the All India Coordinated Research Network on underutilized crops during 2005. Out of 30 trials allotted, data on 25 trials were received. Experiment wise details of trials conducted at various locations are presented in table 139 and the findings of these investigations are discussed as follows:

6.1 GRAIN AMARANTH (*Amaranthus hypochondriacus*)

Experiment No. 1	:	Effect of spacing and fertilizer levels on different genotypes.
Years of start	:	2005
Objectives	:	To workout spatial and fertilizer requirements of grain amaranth genotypes.
Locations	:	Bangalore, Bhubaneswar, S.K. Nagar
Treatments	:	a) Genotypes – BGA-2, GA-1, GA-2, Annapurna, Suvarna b) Fertilizer dose (kg/ha) – R.F. and 75% R.F. c) Spacing – 30x15 and 45x15 cm
Design	:	Factorial RBD
Replications	:	3
Plot size	:	5x3.6 m ²

Results:

This experiment was conducted during kharif 2005 at Bangalore and during rabi 2005-06 at Bhubaneswar and S.K. Nagar. Therefore, only the results obtained at Bangalore are discussed. For Bhubaneswar and S.K. Nagar, data of previous experiment i.e. Response of promising amaranth genotypes to varying manurial treatments are presented.

A perusal of data on grain yield of amaranth varieties under different spacings and fertilizer doses obtained at Bangalore (Table 140) revealed that highest yield of amaranth grain was produced by cv. Suvarna (V₄), followed by

BGA-2 (V₁), GA-1 (V₂), GA-2 (V₃) and Annapurna (V₅). Application of recommended dose of fertilizer (F₁) gave higher grain yield than the 75% R.D.F. (F₂). All the genotypes yielded more under 45x15 cm spacing (S₂) than that under 30x15 cm spacing (S₁). The VxS interaction was significant in all the varieties while VxF interaction was significant only in case of GA-2 (V₃) and Suvarna (V₄).

At Bhubaneswar, the highest grain yield was given by the genotype BGA-2, followed by SKNA-7, RMA-2 and IC-32145. Application of 100% recommended fertilizer (F₂) resulted in maximum grain yield while application of FYM @ 5 tons/ha (F₄) resulted in minimum grain yield (Table 141).

The grain yield at S.K. Nagar (Table 142) was observed to be the highest in IC-120588, followed by SKNA-7, GA-2 and AG-114. Amongst N-fertilizer doses, application of 40kg/ha resulted in highest grain yield. However, the differences among different fertilizer treatments were not significant.

Experiment No. 2	:	Fertilizer management in amaranth based intercrops.
Year of start	:	2004
Objective	:	To find out fertilizer requirement of grain amaranth based intercrops.
Location	:	Ranichauri
Treatments	:	<ul style="list-style-type: none"> a) Intercrops : (i) Rice bean + grain amaranth in 2:1 row ratio (ii) French bean + grain amaranth in 2:1 row ratio b) Fertilizer doses : (i) 1/3 RDF for amaranth + 2/3 RDF for pulse crop (ii) No fertilizer for amaranth + Full RDF for pulse (iii) Full RDF for amaranth + Full RDF for pulse crop
Design	:	RBD
Replications	:	Three

Results:

Data presented in table 143 revealed that the highest seed yield of the pulse crop(s) was obtained by applying full RDF to the pulse and no fertilizer to grain amaranth. This was probably due to the fact that the pulse crop(s) (dominated component) was able to compete better with the tall plants of grain amaranth (dominating component) under this treatment (T₂/T₅). It was interesting to note that the grain yield of amaranth was not affected by not applying fertilizer to the amaranth intercrop. The higher yield of pulse resulted in higher amaranth equivalent yield, net profit and B:C ratio. Thus, applying full recommended dose of pulse pure crop to pulse (rice bean/French bean) – amaranth intercrop gave highest pulse yield, amaranth equivalent yield, net profit and B:C ratio.

Experiment No. 3 : **Integrated nutrient management studies in grain amaranth**

Years of start : 2002

Objectives : To workout a combination of organic and inorganic fertilizer requirement for grain amaranth.

Locations : S.K. Nagar, Hisar, Bhubaneswar

Treatments :

- T₁** - 100% RDF
- T₂** - 100% N through FYM
- T₃** - 100% N through castor cake
- T₄** - 75% N through fertilizer + 25% N through FYM
- T₅** - 75% N through fertilizer + 25% N through FYM + 40 kg P₂O₅
- T₆** - 75% N through fertilizer + 25% N through castor cake
- T₇** - 75% N through fertilizer + 25% N through castor cake + 40 kg P₂O₅
- T₈** - 50% N through fertilizer + 50% N through FYM
- T₉** - 50% N through fertilizer + 50% N through FYM + 40 kg P₂O₅

- T₁₀** - 50% N through fertilizer + 50% N through castor cake
- T₁₁** - 50% N through fertilizer + 50% N through castor cake + 40 kg P₂O₅
- T₁₂** - 25% N through fertilizer + 75% N through FYM
- T₁₃** - 25% N through fertilizer + 75% N through FYM + 40 kg P₂O₅
- T₁₄** - 25% N through fertilizer + 75% N through castor cake
- T₁₅** - 25% N through fertilizer + 75% N through castor cake + 40 kg P₂O₅

Design : RBD
Replications : Three
Plot size : 5x3.6 m²

Results:

Highest grain yield of amaranth (Table 144) was obtained when 25% N was applied through chemical fertilizer, 75% through castor cake and supplemented with 40 kg P₂O₅/ha (T₁₅) at S.K. Nagar, 75% N through fertilizer and 25% N through FYM at Bhubaneswar (T₄), whereas at Hisar, the highest grain amaranth yield was observed under the treatment 50% N through chemical fertilizer + 50% N through castor cake (T₁₀). Also, supplementing with 40 kg P₂O₅ appeared to increase grain yield of amaranth in all combinations (T₅, T₇, T₉, T₁₁, T₁₃, T₁₅). The yields were slightly higher in case of castor cake application supplemented with P₂O₅ than in case of FYM application supplemented with P₂O₅ at S.K. Nagar. At Hisar, it was observed that manuring increased protein content of amaranth grain and the increase in protein percentage was higher where FYM was the source of manuring.

Experiment No. 4 : **Popularization of amaranth in the farmer's field in non-conventional areas**
Years of start : 2005
Objectives : To find out economic feasibility of growing grain amaranth

Locations : Mettupalayam, Bangalore, Bhubaneswar, S.K. Nagar

Treatments : i) Amaranth Vs
ii) Maize/ Finger millet/Mustard/Blackgram

Results:

During 2005-06 two FLDs were conducted in farmer's fields in Tamil Nadu and two in Karnataka. Results of three FLDs comprising two from Tamil Nadu and one from Karnataka are presented below. The fourth one was washed away due to heavy rain.

S. No.	Details	FLD-1	FLD-2	FDL-3
1.	Name of farmer	Mr. Samraj	Mr. C. Duraisamy	Mrs. Rekha G.
2.	Place	Kendepalayam (Tamil Nadu)	Dhayanpur (Tamil Nadu)	Tabarekere hobli (Karnataka)
3.	Crop	Amaranth (cv. Survana)	Amaranth (cv. Suvarna)	Amaranth (cv. Suvarna)
		Black gram (cv. CO-I)	Black gram (cv. CO-I)	--
4.	Area	½ acre each	½ acre each	1 acre
5.	Date of sowing	22.11.05	20.12.05	13.9.05
6.	Date of harvest	15.2.06	21.3.06	15.12.05
7.	Yield (kg/ha)			
	(a) Amaranth	980	920	1158
	(b) Black gram	300	360	--
8.	Gross Income (Rs/ha)			
	(a) @Rs. 10/kg	9800	9200	11,580
	(b) @Rs. 25/kg	7500	9000	--

Experiment No. 5 : **Effect of NPK and FYM on grain amaranth**

Years of start : 2004

Objectives : To study the effect of balanced nutrition and FYM on grain amaranth

Locations : Bhubaneswar

Treatments :

- T₁ - Control (N₀P₀K₀)
- T₂ - N₆₀P₀K₀
- T₃ - N₀P₄₀K₀
- T₄ - N₀P₀K₂₀
- T₅ - N₆₀P₄₀K₀
- T₆ - N₆₀P₀K₂₀
- T₇ - N₀P₄₀K₂₀

	T ₈	-	N ₆₀ P ₄₀ K ₂₀
	T ₉	-	N ₆₀ P ₄₀ K ₂₀ + FYM (5 tons/ha)
Design	:		RBD
Replications	:		Four

Results:

Grain yield of amaranth (Table 145) was observed to increase with application of N, P and K individually as well as in combination over control. However, the increase was significant only in case of N. The grain yield was further enhanced when supplemented with FYM.

6.2 BUCK WHEAT (*Fagopyrum tataricum*)

Experiment No. 6	:	Response of promising buckwheat genotypes to fertilizer doses.
Years of start	:	2004
Objectives	:	To workout fertilizer requirements of buckwheat genotypes in the pipe line.
Locations	:	Sangla, Ranichauri, Almora
Treatments	:	a) Genotypes – Sangla B1, Sangla B5, Shimla B1, Himpriya (C). d) Fertilizer dose : N ₁₅ P ₁₅ K ₁₅ , N ₄₀ P ₄₀ , N ₄₀ P ₄₀ K ₂₀
Design	:	Factorial RBD
Replications	:	3

Results:

All the four tatar buckwheat genotypes were at par in grain yield at Ranichauri but all the three promising genotypes have higher grain yield than the check Himpriya at Sangla. For straw yield, the check Himpriya substantially out yielded all the promising genotypes at Sangla (Table 146). The differences were, however less conspicuous at Ranichauri.

Application of recommended fertilizer dose (N₄₀P₄₀K₀) resulted in higher grain as well as straw yield both at Ranichauri as well as Sangla as compared with farmers practice (N₁₅P₁₅K₁₅). Supplementing the recommended dose with K₂₀ (N₄₀P₄₀K₂₀) further increased the grain and straw yields at Sangla but not at Ranichauri.

6.3 RICE BEAN (*Vigna umbellata*)

Experiment No. 7	:	Performance of rice bean in comparison with green gram and black gram for grain and with cowpea for fodder purposes.
Years of start	:	2005
Objectives	:	To compare the grain/fodder potential of rice bean with other pulses.
Locations	:	Hills – Palampur, Ranichauri Plains – Bangalore, Bhubaneswar, Mettupalayam, Hisar, Ludhiana
Treatments	:	i) Rice bean cvs. PPR-2, BRS-1 (Hills), RBL-6, RBL-1 (Plains) ii) Green gram – locally recommended varieties iii) Black gram – locally recommended varieties iv) Cowpea – locally recommended varieties
Plot size	:	3x3.6 m ² (Hills) 5x3.6 m ² (Plains)
Design	:	RBD
Replications	:	Four

Results:

Rice bean was observed to out yield both green gram and black gram for pulse production at all the locations excepts S.K. Nagar (Table 147). For fodder production, rice bean performed better than cowpea at Ranichauri while cowpea was found to give better performance at Bangalore and Ludhiana.

Experiment No. 8	:	Performance of rice bean based crop rotations under varying fertility conditions.
Years of start	:	2004
Objectives	:	i) To find out suitable crop rotation for rice bean ii) To work out fertilizer requirement of rice bean in different crop rotations.
Locations	:	Hisar

Treatments	:	a) Crop rotations :
		Rice bean - wheat
		Rice bean - mustard
		Rice bean - barley
		Rice bean - berseem
		Rice bean - oats
		Rice bean - gram
		b) Fertilizer dose (for rice bean) – N_0P_0 , $N_{20}P_{20}$, $N_{20}P_{40}$
Design	:	Split plot
Replications	:	Three
Plot size	:	4.5x3.0 m ²

Results:

A perusal of data in table 148 revealed that rice bean equivalent yield was highest in rice bean-wheat crop rotation, followed by rice bean-barley whereas the net returns were the highest in rice bean-barley followed by rice bean-wheat. Thus, wheat and barley are appropriate crops for growing in rotation with rice bean.

A view of data on rice bean response to fertilizer doses under different crop rotations (Table 149) indicated that rice bean responded to fertilizer application upto the highest dose ($N_{20}P_{40}$) in terms of yield and yield attributes.

Experiment No. 9	:	Intercropping studies in rice bean
Years of start	:	2002
Objectives	:	To identify suitable intercrop system for intercropping rice bean with major crops in eastern India.
Locations	:	Bhubaneswar
Treatments	:	i) Maize (sole crop) ii) Sorghum (sole crop) iii) Pearl millet (sole crop) iv) Pigeonpea (sole crop) v) Rice bean (sole crop) vi) Maize + rice bean (intercrop 1:2)

- vii) Sorghum + rice bean (intercrop 1:2)
- viii) Pearlmillet + rice bean (intercrop 1:2)
- ix) Pigeonpea + rice bean (intercrop 1:2)

Design : RBD
Replications : Four

Results:

Intercropping rice bean with maize in 1 (maize) : 2 (rice bean) row ratio was observed to have highest value of rice bean equivalent yield, land use efficiency (LER) and economics (B:C ratio) followed by pigeonpea-rice bean intercrop grown in 1:2 row ratio (Table 150).

Experiment No. 10 : **Optimization of sowing time in rice bean**
Years of start : 2003
Objectives : To find out optimal sowing time for introduction of rice bean in the existing cropping systems in Karnataka and rice fallows in Orissa.

Locations : Bangalore and Bhubaneswar

Treatments : a) Sowing time :
 i) June 16-30 - D₁
 ii) July 1-15 - D₂
 iii) July 16-30 - D₃
 iv) August 1-15 - D₄
 v) August 16-31 - D₅
 vi) September 1-15 - D₆
 vii) September 16-30 - D₇
 b) Genotypes : KHRB-1 - V₁
 LRB-355 - V₂

Design : Split plot
Replications : Four

Results:

Data presented in table 151 indicated that sowing rice bean in the second fortnight of August (D₅) resulted in the highest seed yield of rice bean at Bangalore. The second and third highest seed yields of rice bean were obtained at Bangalore when the crop was sown in the first and second fortnights of

September, respectively. On the other hand, the optimal sowing time for rice bean was observed to be the second fortnight of July at Bhubaneswar. The second best sowing time were observed to be first fortnight of July and first fortnight of August, which were at par. Delaying the sowing of rice bean beyond first fortnight of August led to linear decrease in the seed yield of rice bean. Between the two genotypes, LRB-355 out yielded KHRB-1 at Bangalore while at Bhubaneswar BRB-1 gave more seed yield than LRB-355 when sown upto first fortnight of August. The reduction in yield of LRB-355 was less than that of BRB-1 under late sown conditions.

6.4 JATROPHA (*Jatropha curcas*)

Experiment No. 11 : **Effect of spacing, nutrients and pruning in *Jatropha*.**

Years of start : 2000 (modified in 2005)

Objectives : To workout spatial and fertilizer requirement of *Jatropha*.

Locations : Mettupalayam. S.K. Nagar, Hisar

Treatments : a) Spacing : 1x1m, 1.5x1.5m, 2x2m, 3x2m, 3x3m
 b) Fertilizer dose: $N_0P_0K_0$, $N_{15}P_{10}K_{10}$, $N_{30}P_{20}K_{20}$, $N_{45}P_{30}K_{30}$
 c) Pruning: 9" above ground during dormancy in Ist year and 2/3 part of branches 3rd year onwards.

Design : Split plot

Replications : Three

Plot size : 6x6 m²

Results:

At S.K. Nagar, observation on two year old plantation (Table 152) indicated that plant growth increased with spacing under control fertilizer treatment (N_0P_0) and with application of fertilizer upto a dose of $N_{30}P_{20}$. On the other hand, seed yield increased with all levels of spacing and doses of fertilizer.

Table 139. Centre-wise details of agronomic experiments conducted during 2005

S.No.	Experiment	Mettupalaym	Bangalore	Bhubaneswar	S.K. Nagar	Hisar	Ludhiana	Ranichauri	Palampur/ Sangla	Total
1.	Effect of spacing and fertilizer levels on different amaranth genotypes	-	Y	Y	Y	-	-	-	-	3 (3)
2.	Fertilizer management in grain amaranth based intercrops	-	-	-	-	-	-	Y	-	1 (1)
3.	Integrated nutrient management studies in grain amaranth	-	-	Y	Y	Y	-	-	-	3 (3)
4.	Effect of NPK and FYM on grain amaranth	-	-	Y	-	-	-	-	-	1 (0)
5.	Response of promising buckwheat genotypes to fertilizer doses	-	-	-	-	-	-	Y	Y	2 (2)
6.	Response of rice bean in comparison with green gram and black gram for grain and with cowpea for fodder purposes	Y	Y	Y	Y	N	Y	Y	N	6 (8)
7.	Intercropping studies in rice bean	-	-	Y	-	-	-	-	-	1 (1)
8.	Optimization of sowing time in rice bean	-	Y	Y	-	-	-	-	-	2 (2)
9.	Performance of rice bean based crop rotations under various fertility conditions	-	-	-	-	Y	-	N	-	1 (2)
10.	Effect of spacing, nutrients and pruning in Jatropha	Y	-	-	Y	Y	-	-	-	3 (3)
11.	Response of promising genotypes of Kalingada to varying doses of nitrogen	-	-	-	N	-	-	-	-	0 (1)
12.	Popularization of amaranth in farmer's field in non-conventional areas	Y	Y	N	N	-	-	-	-	2 (4)
Total		3(3)	4(4)	6(6)	4(6)	3(4)	1(1)	3(4)	1(2)	25(30)

Note : Figures in parenthesis indicate the number of trials allotted.

Table 140. Grain yield of grain amaranth as influenced by fertilizer levels and spacing at Bangalore

Treatments	Grain yield (kg/ha)	Means of varieties (V)	Interaction values
V ₁ F ₁ S ₁	1081	V ₁ : 1204	V ₁ F ₁ : 1260
V ₁ F ₁ S ₂	1439	V ₂ : 988	V ₁ F ₂ : 1148
V ₁ F ₂ S ₁	907	V ₃ : 960	V ₂ F ₁ : 1011
V ₁ F ₂ S ₂	1388	V ₄ : 1273	V ₂ F ₂ : 964
V ₂ F ₁ S ₁	833	V ₅ : 708	V ₃ F ₁ : 1024
V ₂ F ₁ S ₂	1189	CD (0.05) : 85	V ₃ F ₂ : 896
V ₂ F ₂ S ₁	800	Means of fertilizer (F)	V ₄ F ₁ : 1375
V ₂ F ₂ S ₂	1129	F ₁ : 1085	V ₄ F ₂ : 1171
V ₃ F ₁ S ₁	868	F ₂ : 968	V ₅ F ₁ : 755
V ₃ F ₁ S ₂	1180	CD (0.05) : 53	V ₅ F ₂ : 662
V ₃ F ₂ S ₁	696	Means of spacing (S)	CD (0.05) : 120
V ₃ F ₂ S ₂	1097	S ₁ : 865	V ₁ S ₁ : 994
V ₄ F ₁ S ₁	1240	S ₂ : 1188	V ₁ S ₂ : 1414
V ₄ F ₁ S ₂	1509	CD (0.05) : 53	V ₂ S ₁ : 816
V ₄ F ₂ S ₁	999		V ₂ S ₂ : 1159
V ₄ F ₂ S ₂	1342	Means of FxS	V ₃ S ₁ : 782
V ₅ F ₁ S ₁	641	F ₁ S ₁ : 933	V ₃ S ₂ : 1138
V ₅ F ₁ S ₂	868	F ₁ S ₂ : 1237	V ₄ S ₁ : 1120
V ₅ F ₂ S ₁	583	F ₂ S ₁ : 797	V ₄ S ₂ : 1425
V ₅ F ₂ S ₂	740	F ₂ S ₂ : 1139	V ₅ S ₁ : 612
		CD (0.05) : 76	V ₅ S ₂ : 804
CD (0.05)	170		CD (0.05) : 120
CV (%)	10		

V₁ : BGA-2; V₂ : GA-1; V₃ : GA-2; V₄ : Suvarna; V₅ : Annapurna
 F₁ : 40:20:20 kg NPK/ha (R); F₂ : 30:15:15 kg NPK/ha (75% R)
 S₁ : 30x15cm; S₂ : 45x15 cm

Table 141. Effect of different manurial treatments on grain yield (kg/ha) of promising amaranth genotypes at Bhubaneswar

Genotypes	Manurial treatments				
	F ₁	F ₂	F ₃	F ₄	Mean
BGA-2	1075	1462	1284	862	1171
RMA-2	1016	1287	1192	877	1093
IC-32145	984	1182	1045	853	1002
SKNA-7	1041	1379	1225	805	1112
Mean	1029	1314	1186	849	

CD at 5% Genotype : 110
 Fertilizer : 70
 GxF : N.S.

F₁ : 75% R.D.F.; F₂ : 100% R.D.F.; F₃ : 125% R.D.F.; F₄ : FYM @5 tons/ha

Table 142. Effect of N-dose on grain (yield (kg/ha) of promising amaranth genotypes at S.K. Nagar

Genotypes	N-dose				Mean
	N ₄₀	N ₆₀	N ₈₀	N ₁₀₀	
IC-120588	3324	3437	3205	3357	3330
AG-114	2810	2631	2823	2834	2774
GA-2	3016	2824	2690	2848	2844
SKNA-7	3171	2896	2833	2796	2924
Mean	3080	2947	2888	2959	

Table 143. Grain yield (kg ha⁻¹) and economics of different fertilizer doses on grain amaranth based intercrops at Ranichauri

Treatments	Pulse crop yield (kg ha ⁻¹)	Grain amaranth yield (kg ha ⁻¹)	Amaranth equivalent yield (kg ha ⁻¹)	Net profit (Rs. ha ⁻¹)	B:C ratio
T ₁ - RB + GA in 2:1 ratio with 1/3 RDF for amaranth + 2/3 RDF for rice bean (N _{26.70} P _{33.33})	537	526	1242	1681	1.09
T ₂ - RB + GA in 2:1 ratio with no fertilizer for amaranth + full RDF for rice bean (N ₂₀ P ₄₀)	917	702	1924	11833	1.69
T ₃ - RB + GA in 2:1 ratio & full RDF for amaranth + full RDF for rice bean	686	633	1548	5367	1.30
T ₄ - FB + GA in 2:1 ratio with 1/3 RDF for amaranth + 2/3 RDF for french bean (N ₆₀ P ₆₀)	930	631	2181	15029	1.84
T ₅ - FB + GA in 2:1 ratio with no fertilizer for amaranth + full RDF for french bean (N _{26.70} P _{33.33})	1293	832	2987	27061	2.52
T ₆ - FB + GA in 2:1 ratio with full RDF for amaranth + full RDF for french bean (N ₆₀ P ₆₀)	1013	826	2514	19140	2.03
C.D. (5%)	301	200	184		
CV (%)	19.4	16.7	5.15		

RB – Rice bean; GA – Grain amaranth; FB – French bean

Table 144. Effect of different integrated nutrient management treatments on yield and protein content of grain amaranth

Treatment	Grain yield (kg/ha)			Protein content (%)
	S.K. Nagar	Bhubaneswar	Hisar	Hisar
T ₁	1747	1245	543	14.20
T ₂	1273	-	454	15.10
T ₃	1339	-	-	-
T ₄	1542	1487	561	14.40
T ₅	1865	-	-	-
T ₆	1340	1192	599	14.27
T ₇	1906	-	-	-
T ₈	1305	1265	670	14.80
T ₉	1458	-	-	-
T ₁₀	1132	1055	709	14.47
T ₁₁	1749	-	-	-
T ₁₂	1237	914	490	15.00
T ₁₃	1363	-	-	-
T ₁₄	1378	864	510	14.67
T ₁₅	1949	-	-	-
Control	-	325	390	13.50
C.D. (5%)		169	122	0.18

Table 145. Effect of N, P, K and FYM on grain yield of amaranth (Rabi 2004-05) at Bhubaneswar

Treatments	Grain yield (kg/ha)
T ₁ - Control	261.0
T ₂ - N ₆₀ P ₀ K ₀	856.3
T ₃ - N ₀ P ₄₀ K ₀	390.2
T ₄ - N ₀ P ₀ K ₂₀	302.0
T ₅ - N ₆₀ P ₄₀ K ₀	1020.2
T ₆ - N ₆₀ P ₀ K ₂₀	946.4
T ₇ - N ₀ P ₄₀ K ₂₀	468.3
T ₈ - N ₆₀ P ₄₀ K ₂₀	1112.0
T ₉ - N ₆₀ P ₄₀ K ₂₀ + FYM @5t/ha	1284.2
CD (5%)	137.0

Table 146. Effect of different fertilizer doses on grain and straw yield of promising buckwheat genotypes.

Genotypes	Grain Yield (kg/ha)		Straw yield (kg/ha)	
	Ranichauri	Sangla	Ranichauri	Sangla
Sangla B-1	785	2410	2254	2946
Sangla B-5	759	2273	2343	3079
Shimla B-1	806	2189	2498	2494
Himpriya	829	1420	2456	5484
C.D. at 5%	NS	-	172	
Fertilizer dose				
N ₁₅ P ₁₅ K ₁₅	663	1770	1939	3171
N ₄₀ P ₄₀ K ₀	943	2102	2718	3399
N ₄₀ P ₄₀ K ₂₀	778	2347	2506	3931
C.D. at 5%	67		149	

Table 147. Performance of rice bean, green gram, black gram and cowpea at different locations

S. No.	Treatment	Grain/fodder yield (kg/ha)					
		Ranichauri	Ludhiana	Bhubaneswar	Bangalore	Mettupalayam	S.K. Nagar
1.	Rice bean (Grain)	1050	1793	1287	743	1280	18
2.	Rice bean (Fodder)	12496	14500	1492	10700	1008	1126
3.	Moong (Grain)	841	1264	775	617	909	1350
4.	Urd (Grain)	780	848	968	497	1020	870
5.	Cowpea (Fodder)	8150	49000	1906	16200	722	1400
	C.D. at 5%	1633	195	197	11/1100	76	-

Table 148. Economics of various rice bean based crop rotations at Hisar

Crop systems	Rice bean crop yield (kg/ha)	Rabi crop yield (kg/ha)	Rice bean crop equivalent yield (kg/ha)	Gross returns (Rs./ha)	Total cost of production	Net returns (Rs./ha)
Rice bean – wheat	663	5398	3664	54960	44475	10485
Rice bean – oats	619	1414	2362	35425	43571	-8146
Rice bean – barley	649	4602	3185	47774	36530	11244
Rice bean – gram	607	313	983	14739	30522	-15783
Rice bean – mustard	612	468	1243	18636	34270	-15634
Rice bean – berseem	637	16	897	13449	46432	-32983
CD at 5%	NS	--	--	--	--	--

Rates :

Ricebean @Rs. 15.0 Rs./kg; Wheat grain @ Rs. 6.40/kg; Wheat straw @Rs. 1.25/kg; Oats seed @ Rs. 10.0/kg; Oats straw @Rs. 1.0/kg; Barley grain @Rs. 5.60/kg; Barley straw @Rs. 0.80/kg] Gram @Rs. 18.0/kg; Gram straw @Rs. 1.0/kg; Mustard @Rs. 17.0/kg; Mustard byproduct @Rs. 1500/ha; Berseem seed @Rs. 100.0/kg and Berseem green produce @Rs. 1.0/kg

Table 149. Growth and yield attributes of rice bean crop as affected by different crop rotations and fertilizer treatments at Hisar

Treatments	Plant height (cm)	Pod length (cm)	No. of seeds/pod	No. of pods/plant	Seed yield per plant (g)	Seed yield (kg/ha)
A. Crop Rotations:						
Ricebean – Wheat	99.0	7.40	7.64	56.7	18.2	663
Ricebean – Barley	98.1	7.60	7.81	57.6	17.5	649
Ricebean – Oats	97.7	7.50	7.84	59.0	17.0	619
Ricebean – Berseem	95.6	7.63	7.58	56.9	17.1	637
Ricebean – Gram	98.6	7.38	7.82	58.7	16.2	607
Ricebean – Raya	95.8	7.51	8.05	57.1	16.6	612
CD at 5%	NS	NS	NS	NS	NS	NS
B. Fertilizer levels:						
N ₀ P ₀	91.1	6.54	7.19	50.6	11.9	518
N ₂₀ P ₂₀	97.9	7.62	7.93	59.3	18.3	669
N ₂₀ P ₄₀	99.8	8.11	8.25	63.1	21.1	706
CD at 5%	1.4	0.19	0.27	2.5	0.5	48

Table 150. Grain yield, equivalent yield, LER and economics of intercropping systems of rice bean at Bhubaneswar

Treatments	1 st crop yield (kg/ha)	Rice bean as intercrop yield (kg/ha)	Rice bean equivalent yield (kg/ha)	LER	B:C ratio
Maize (sole)	3070	-	1540	1.00	1.75
Sorghum (sole)	2310	-	1160	1.00	1.46
Pearlmillet (sole)	1950	-	980	1.00	1.30
Pigeonpea (sole)	1120	-	1400	1.00	1.68
Ricebean (sole)	1260	-	1260	1.00	1.68
Maize+Ricebean (1:2)	2280	810	1950	1.39	2.13
Sorghum+Ricebean (1:2)	1740	570	1440	1.21	1.73
Pearlmillet+Ricebean (1:2)	1420	560	1270	1.17	1.60
Pigeonpea+Ricebean (1:2)	790	720	1710	1.27	2.05
CD (5%)	-	-	116	-	-

Table 151. Effect of different sowing times on seed yield (kg/ha) of rice bean genotypes

S.No.	Treatment	Bangalore	Bhubaneswar
1.	D ₁ V ₁	-	1137
2.	D ₁ V ₂	-	978
3.	D ₂ V ₁	-	1288
4.	D ₂ V ₂	-	1120
5.	D ₃ V ₁	461	1433
6.	D ₃ V ₂	708	1276
7.	D ₄ V ₁	822	1120
8.	D ₄ V ₂	1140	1058
9.	D ₅ V ₁	718	751
10.	D ₅ V ₂	1075	776
11.	D ₆ V ₁	613	354
12.	D ₆ V ₂	985	448
13.	D ₇ V ₁	541	-
14.	D ₇ V ₂	708	-
CD (5%)	V	104	56
	D	67	110
	VxD	131	1147

Table 152. Effect of spacing and nutrients on Jatropha at S.K. Nagar

S.No.	Treatment	Plant height (cm)	No. of branches	Stem girth (cm)	No. of capsules	Seed yield (kg/ha)
1.	S ₁ F ₁	121	2.87	23.84	10.12	4.70
2.	S ₁ F ₂	173	5.60	28.61	21.83	19.05
3.	S ₁ F ₃	186	5.20	28.00	26.46	17.48
4.	S ₁ F ₄	190	6.20	28.03	25.61	36.44
5.	S ₂ F ₁	129	4.31	26.95	24.83	25.00
6.	S ₂ F ₂	172	4.62	28.43	25.33	13.54
7.	S ₂ F ₃	212	5.28	29.51	31.18	57.70
8.	S ₂ F ₄	214	5.68	31.00	46.60	75.47
9.	S ₃ F ₁	167	3.71	27.41	13.33	-
10.	S ₃ F ₂	186	6.10	30.71	21.16	32.09
11.	S ₃ F ₃	186	4.61	29.12	34.45	55.47
12.	S ₃ F ₄	207	5.12	32.26	38.12	65.08
13.	S ₄ F ₁	171	4.29	28.16	25.21	15.84
14.	S ₄ F ₂	198	5.67	31.27	36.60	28.12
15.	S ₄ F ₃	227	6.34	31.52	61.60	71.04
16.	S ₄ F ₄	218	6.27	30.37	76.66	138.57

S₁ : 1x1m; S₂ : 2x1m; S₃ : 1.5x1.5m; S₄ : 2x2m

F₁ : N₀P₀; F₂ : N₁₅P₁₀; F₃ : N₃₀P₂₀; F₄ : N₄₅P₃₀

SUMMARY

VII. A SUMMARY OF RESEARCH ACHIEVEMENTS DURING 2005

A total of 156 experiments were allotted during 2005 including germplasm evaluation (46), breeding (67), agronomic (30) and quality (13) of underutilized crops at twenty one locations in different agro-climatic zones of the country. Out of these, 142 trials were carried out. A summary of research achievements is given below:

7.1 Plant breeding

Sixty seven varietal trials, 23 in hills and 44 in plains, were conducted on ten under-utilized crops in order to identify improved varieties of various underutilized crops. Details of trials, entries, number of locations and highest yielding entries are given below in table:

Table 153. Best genotypes in different trials conducted at multilocations during 2005

Crop		Entries	Locations	Top yielder	Yield (q/ha)
HILLS					
Amaranth	IVT	4	5	IC35407 (C)	19.10
Buckwheat	IVT	5	4	Shimla B-1 (C)	14.65
	AVT-I	5	3	SAGAB-101	18.96
Chenopodium	IVT	5	1	IC417754 (C)	11.26
	AVT-I	3	1	IC417754 (C)	11.26
Rice bean	IVT	4	5	BRS-1	10.54
Azuki bean	IVT	2	3	HPU 51 (C)	8.29
	AVT-I	12	3	SMLAB-4	8.42
Faba bean	IVT	18	1	HB-43	26.37
PLAINS					
Amaranth Kharif	IVT	8	3	GA-1 (C)	7.96 q/ha
Amaranth Rabi	AVT-I	7	8	RMA-3	12.54
	IVT	12	8	IC368367	14.94
Rice bean	IVT	1	7	RBL-50	11.85
	AVT-II	4	9	RBL-50	11.65
Faba bean	IVT	6	6	HB 416	16.76
	AVT-I	3	6	HB 430	15.93
	AVT-II	1	6	Vikrant	14.59
Winged bean	IVT	9	5	IC 26945	8.25
Kankoda	IVT	10	4	RMF – 27	18.85
Tumba	IVT	9	1	RMT 403	7.04
Jatropha	IVT	8	3	Hans Raj	3.67

Based on the three years data, the best genotype in each crop with respect to yield has been identified and indicated in Table 154. The proposal of these genotypes and others ranking either second or third, whose performances have been given in Annual Report, can be submitted to Variety Identification Committee for consideration of their identification as varieties.

Table 154. List of promising genotypes based on three years data

Crop	Genotype	Average seed yield (q/ha)	Increase/decrease over check (%)	
			First check	Second check
PLAINS				
Rice bean	RBL-50 (C)	11.29	-	-
	RBL -6 (C)	10.85	-	-
Faba bean	NDF-1	12.96	-0.0035	-

7.2 Germplasm evaluation

Over 2569 accessions, some of them tested at more than one location, were evaluated at twenty four locations during 2005. Crop-wise number of accessions, locations and promising accessions have been given in table 155.

Table 155. Performance of germplasm accessions in different crops

Crops	No. of accessions	Location	Check	Best accession (Yield g/plant)	Best accession (Days to maturity)	Best accession (Yield q/ha)
HILLS						
Amaranth	50	Ranichauri	PRA-1 PRA-2 Annapurna Suvarna	-	-	-
	24	Palampur	IC035407 Annapurna PRA-2 PRA-3	-	IC42311-17 (108.0)	IC037148 (9.0), IC021810 (6.5)
	50	Shimla	PRT-2 Annapurna	IC37148 (474.02), IC49284-5 (455.15)	IC42265-3 (127.0), IC37149 (148.0)	-
		Based on 2 locations	-	IC037148 (278.07), IC037153 (268.99)	-	-
Buckwheat	50	Shimla	Himpriya PRB-1	IC258232 (171.10), IC329456 (28.87)	IC381129 (140.0), IC381120 (138.0)	-

	50	Ranichauri	Himpriya PRB-1 VL-7	IC341679 (162.11), IC274439 (155.18)	-	-
	50	Sangla	Himpriya PRB-1	IC274439 (4.6), EC323729 (4.5)	IC381120 (86.0), IC381129 (87.0)	IC274424 (44.88), IC274439 (36.20)
	95	Shillong	-	-	IC324244 (62.0)	-
		Based on 3 locations	-	IC258232 (85.8), IC329456 (15.6)	-	-
Chenopodium	23	Shimla		IC415477 (201.75), IC341710 (152.85)	IC415477 (118.0), IC328878 (129.0)	-
Rice bean	50	Shimla	PRA-1 PRA-2	-	LRB-7 (150.0), LRB 22.2 (152.0)	-
	50	Ranichauri	PRA-1 PRA-2	LRB 22-2 (50.16), LRB 15 (48.47)	BRS 2 (161.0), LRB 8 (164.0)	-
	43	Palampur	PRA-1 PRA-2 RBL-1 RBL-2 RBL-35	-	LRB 751 (118.0), LRB 008 (119)	IC374483 (23.38), LRB 351 (23.05)
	62	Bhowali	PRA-1 PRA-2 Naini	LRB-9 (18.1), LRB-10 (16.2)	LRB-5 (64.0) LRB-79 (126.0)	-
	50	Shillong	PRA-1 PRA-2 RBL-1 RBL-6	-	-	LRB 053 (19.03), LRB 075-2 (16.97)
			Based on 5 locations		LRB 022 (37.95), LRB 015 (29.54)	LRB 009 (26.37), LRB 010 (21.46)
Azuki bean	24	Shimla	HPU-51 SMLAB-1	HPU-51(C) (22.4) EC340263 (21.75)	EC340247 (143.0)	-
	22	Palampur	HPU-25 HPU-27 HPU-51 IC241041 (C)	-	EC341952 (61.0), EC015257 (92.0)	EC340247 (13.6), EC030256 (13.6)
	13	Ranichauri	HPU51	SMLAB-1 (40.0)	SMLAB-8 (102.0) IC241041 (102.0)	-
Job's tear	20	Ranichauri	-	-	-	RVN 90 (9.4), H 2279 (8.75)
	45	Shillong	Pollin Moyeun	-	IC417053 (66.0), IC006645 (67.0)	IC416897 (69.4), IC89384 (37.5)
Perilla	20	Ranichauri	-	H 1812 (22.4), RD 029 (22.12)	BDS 1647 (160.0). BDS 1650 (160.0)	-

	20	Shillong	BDS-1699	BDS-1650 (34.0), BDS-1649 (15.23)	Local check	IC006441 (15.26), IC211608 (13.81)
PLAINS						
Amaranth (Kharif 2005)	50	Bangalore	Annapurna GA-1 GA-2	-	IC423410 (60.0), IC423548 (60.0)	-
	50	Mettupalayam	Annapurna GA-1 GA-2 Suvarna	IC415236 (20.0)	IC415297 (30.0), IC415317 (30.0)	-
	50	Rahuri	Annapurna GA-1 GA-2	-	-	IC41533 1 (37.04), EC519538 (37.04)
		Based on 3 locations	-	-	IC423410 (71.0), IC415268 (71.3)	-
Amaranth (Rabi 2004-05)	50	S.K. Nagar	GA-1 GA-2	-	-	-
	62	Delhi	-	-	IC344699 (149.0), IC398476 (149.0)	IC394084 (34.41), IC398495 (32.19)
	63	Hisar	Annapurna GA-1 GA-2 Suvarna	RAM-8 (31.8), PRA-2004 (30.8)	IC357661 (93.0), IC35598 (191.0)	-
Rice bean	103	Ludhiana	RBL 05 RBL-35 LBL-50	-	LRB-15 (109.0), LRB-1 (119.0)	LRB 028 (36.25), LRB 102 (32.92)
	120	Bhubaneswar	RBL 05 RBL-35 LBL-50	BRB 10 (17.35), BRB 20 (15.46)	LRB 012-1 (89.0)	BRB-10 (17.3), LRB-115 (16.35)
	100	Bangalore	RBL 05 RBL-35 LBL-50	-	LRB-114 (72.0), LRB-35 (75.0)	-
	100	Rahuri	RBL 05 RBL-35 LBL-50	-	LRB-49 (59.0), LRB-741 (67.0)	LRB004 (17.22), LRB024 (16.67)
	124	New Delhi	RBL 05 RBL-35 LBL-50	LRB-43 (95.0), LRB-68 (90.0)	LRB-47 (102.0), IC 364080 (112.0)	LRB 073-1 (32.8), LRB 074-1 (30.56)
	100	Ranchi	RBL 05 RBL-35 LBL-50	-	LRB 85 (96.0), LRB 116 (97.0)	-
	100	S.K. Nagar	RBL 05 RBL-35 LBL-50	LRB-91 (7.32), LRB-12 (6.4)	LRB-21-2 (113.0), LRB-104 (116.0)	-
		Based on 7 locations (obs. value)		LRB071-1 (32.1), LRB033-1 (28.8)	LRB068 (109.9), LRB091 (111.0)	LRB081 (20.6), LRB073-1 (18.3)

		Based on 7 locations (adj. value)		LRB071-2 (31.2), LRB072-2 (29.3)	-	LRB081 (20.5), LRB028 (18.4)
Faba bean	187	Hisar	PRT – 12 PRT – 7 VH-82-1	HB-516 (104.0), HB-504 (101.0)	EC 323731 (163.0), IC 332138 (164.0)	-
	193	Delhi	PRT – 12 PRT – 7 VH-82-1	-	MKS/AKT260 (135.0), EC 117726 (137.0)	IC 361496 (55.50), EC 243808 (51.06)
Windged bean	19	Rahuri	-	EC95222 (27.0), EC27886 (23.0)	EC178287 (122.0), EC21904 (150.0)	EC142667 (16.10), IC45229-1 (15.27)
	25	Ranchi	-	-	EC95234 (153.0), EC27885-1 (155.0)	-
	19	Ambikapur	-	-	EC142662 (155.0), IC95222 (156.0)	IC95248 (6.39), EC142654-4 (3.06)
	29	Bangalore	AKWB-1	NBRI-Sel. (23.0)	IC178266 (140.0), ic095248 (142.0)	-
			Based on 4 locations	-	IC095248 (45.9), ic095222 (23.5)	IC095234 (153.0), EC142667 (155.5)
Kalingada	49	S.K. Nagar	GK-1	-	-	-
	37	Mandor	-	-	-	SKNK-112 (2.75), SKNK-129 (2.52)
Tumba	22	Mandor	-	RMT 516 (4.1 kg) RMT 515 (4.0 kg) (Fruit yield)	-	RMT 516 (7.56), RMT 515 (6.94)
Jatropha	11	Hisar	-	-	-	-
	28	S.K. Nagar	-	-	-	-
Simaruba	13	Bhubaneswar	-	-	-	-
	27	Mandor	-	Plant No. 1 (690.0)	-	-
	27	Rahuri	-	-	-	-

7.3 Quality

Seeds of promising genotypes in AVT and IVT of nine underutilized crops from seven centres was planned to be analysed for quality but due to non supply of seed in some of the crops, quality analysis was done only in five underutilized crops received from five centres at CCS HAU, Hisar. Crop-wise list of best genotypes are given in the table below :

Crops	Best genotypes
Faba bean (AVT), Hisar	Protein (HB-518: 25.2%) Vicine-convicine (HB-303: 0.76%)
Faba bean (germplasm), Hisar	Protein (EC-322967: 26.8%) Vicine-convicine (GP-3: 0.72%)

Grain Amaranth (AVT), S.K. Nagar	Protein (BGA-7: 14.2%) Lysine (MGA-2: 5.3%) Starch (GA-2: 62.4%)
Grain Amaranth (AVT), Shimla	Protein (PRA-2: 15.0%) Lysine (PRA-9401: 5.6%) Starch (PRA-2000: 61.8%)
Tumba (IVT), Mandor	Oleic acid (RMT-161: 18.1%) Linoleic acid (RMT-142: 53.6%) Linolenic acid (RMT-144: (5.4%)
Buckwheat (AVT), Ranichauri	Fe content (Himpriya: 40.90 mg/100g) Zn content (Sangla B-7: 51.4 mg/100g) Ni content (PRB-9001-1: 12.86 mg/100g) Mn content (Himpriya: 3.94 mg/100g) Cu content (Sangla B-2: 1.91 mg/100g)
Buckwheat (AVT), Shimla	Protein (Sangla B3: 14.5%) Lysine (Sangla B7: 5.3%)
Chenopodium (AVT), Ranichauri	Fe content (PRC-9805: 38.19 mg/100g) Zn content (PRC-9807: 5.25 mg/100g) Ni content (PRC-9805: 29.71 mg/100g) Mn content (PRC-9801: 0.79 mg/100g)

7.4 Agronomy

Eleven agronomic experiments comprising five investigations on grain amaranth, four trials on rice bean and one study each on buckwheat and Jatropha were conducted at eight centres of the All India Coordinated Research Network on underutilized crops during 2005. Experiment wise findings are presented in table given below :

S.No.	Experiment	Finding(s)
1.	Effect of spacing and fertilizer levels on different amaranth genotypes	Suvarna variety gave the highest yield with application of NPK @ 40:20:20 kg/ha under 45x15 cm spacing at Bangalore.
2.	Fertilizer management in grain amaranth based intercrops	Application of full recommended dose of pulse crop gave highest yield of amaranth-rice bean/french bean intercrop.
3.	Integrated nutrient management studies in grain amaranth	Highest yield of amaranth was obtained when 25% N was applied through chemical fertilizer and 75% through castor seed cake supplemented with 40 kg P ₂ O ₅ /ha at S.K. Nagar.
4.	Effect of NPK and FYM on grain amaranth	Grain yield of amaranth increased with N, P and K individually as well as collectively over control.

S.No.	Experiment	Finding(s)
5.	Response of promising buckwheat genotypes to fertilizer doses	At Sangla all the promising genotypes outyielded the check variety. Sangla B-1 was the highest yielder. Application of recommended dose of fertilizer (N ₄₀ P ₄₀) gave higher grain yield than farmer's practice (N ₁₅ P ₁₅ K ₁₅). The yield was further enhanced when the recommended dose was supplemented with 20 kg K ₂ O/ha.
6.	Response of rice bean in comparison with green gram and black gram for grain and with cowpea for fodder purposes	Rice bean outyielded green gram and black gram for seed production at all locations except S.K. Nagar. For fodder production rice bean performed better than cowpea at Ranichauri while cowpea gave better performance than rice bean at Bangalore.
7.	Intercropping studies in rice bean	Intercropping rice bean with maize in 2:1 ratio resulted in highest rice bean equivalent yield, LER and B:C ratio.
8.	Optimization of sowing time in rice bean	Sowing rice bean in the second fortnight of August resulted in the highest yield of rice bean at Bangalore, whereas the optimal sowing time at Bhubaneswar was observed to be the second fortnight of July.
9.	Performance of rice bean based crop rotations under various fertility conditions	Rice bean equivalent yield was highest in rice bean-wheat crop rotation while net return was highest in rice bean-barley crop rotation at Hisar.
10.	Effect of spacing, nutrients and pruning in Jatropha	In two year old plantation of Jatropha the plant growth increased with spacing under control fertilizer dose. It responded to fertilization application upto a dose of N ₃₀ P ₁₀ . On the other hand, seed yield increased with the level of spacing and dose of fertilizer upto the highest level.
11.	Popularization of amaranth in farmer's field in non-conventional areas	In two FLDs in Tamil Nadu amaranth gave higher yield and more income than black gram.

ANNEXURES

Annexure-I

Weighted mean seed yield (q/ha) of ricebean(Early duration) varieties tested for the last three years :Plains

S. No.	Genotype	2003		2004		2005		Weighted		Rank	Per cent increase/decrease over check over check			
		Mean	Location	Mean	Location	Mean	Location	Mean	Location		RBL 1	RBL 6	RBL 35	RBL 50
1	BRB 1	6.57	2	11.21	7	9.67	7	9.96	16		0.08	0.02	-0.08	-0.12
2	BRB 2	8.47	2	10.86	7	9.36	9	9.84	18		0.06	0.01	-0.09	-0.13
3	LRB 303	6.49	6	10.77	9	11.54	9	9.99	24	III	0.08	0.02	-0.08	-0.12
4	LRB 330	5.65	7	10.44	9	10.77	9	9.22	25		0.00	-0.06	-0.15	-0.18
5	RBL 1(C)	5.95	7	9.77	9	11.31	9	9.25	25		0.00	-0.05	-0.15	-0.18
6	RBL 6(C)	6.47	6	10.71	9	10.99	9	9.76	24		0.05	0.00	-0.10	-0.14
7	RBL 35(C)			10.18	9	11.52	9	10.85	18	II	0.17	0.11	0.00	-0.04
8	RBL 50(C)			10.92	9	11.65	9	11.29	18	I	0.22	0.16	0.04	0.00
	Mean	6.60		10.61		10.85		10.02						

Annexure-II

Weighted mean Days to maturity of ricebean(Early duration) varieties tested for the last three years :Plains

S. No.	Genotype	2003		2004		2005		Weighted		Rank	Per cent increase/decrease over check over check			
		Mean	Location	Mean	Location	Mean	Location	Mean	Location		RBL 1	RBL 6	RBL 35	RBL 50
1	BRB 1	87.63	2	110.31	7	111.28	8	108.10	17		0.05	0.04	0.07	0.02
2	BRB 2	101.25	2	110.26	7	113.01	10	110.76	19		0.07	0.06	0.10	0.04
3	LRB 303	91.50	6	105.95	9	105.98	10	102.49	25	III	-0.01	-0.02	0.02	-0.04
4	LRB 330	96.50	7	105.59	9	103.65	10	102.40	26	II	-0.01	-0.02	0.02	-0.04
5	RBL 1(C)	96.57	7	105.14	9	105.83	10	103.10	26		0.00	-0.01	0.02	-0.03
6	RBL 6(C)	100.75	6	105.18	9	105.05	10	104.06	25		0.01	0.00	0.03	-0.02
7	RBL 35(C)			100.49	9	101.16	10	100.84	19	I	-0.02	-0.03	0.00	-0.05
8	RBL 50(C)			106.72	9	106.18	10	106.44	19		0.03	0.02	0.06	0.00
Mean		95.70		106.21		106.52		104.77						

Annexure-III

Weighted mean for seed yield (q/ha) of fababean varieties tested for the last three years : Plains

S.No.	Genotypes	2003		2004		2005		Weighted			Percent increase/ decrease over check Vikrant
		Mean	Location	Mean	Location	Mean	Location	Mean	Location	Rank	
1	NDF-1	20.58	3	6.97	5	14.39	5	12.96	13		-0.0035
2	Vikrant (C)	20.82	4	6.48	6	14.59	5	13.01	15		

Annexure-IV

Weighted mean for Days to maturity of fababean varieties tested for the last three years : Plains

S.No.	Genotypes	2003		2004		2005		Weighted			Percent increase/ decrease over check Vikrant
		Mean	Location	Mean	Location	Mean	Location	Mean	Location	Rank	
1	NDF-1	147.78	3	140.27	5	138.60	6	141.16	14		0.01
2	Vikrant (C)	144.94	4	140.96	6	136.74	6	140.37	16		

Annexure-V

Number of trials/activities allotted and conducted at various centres AICRP on Underutilized Crops

Name of centre	Allotted					Conducted					
	Breeding/ Germplasm	Agronomy	Adaptive	Quality	Total	Breeding/ Germplasm	Adaptive	Agronomy	Quality	Total	Per cent
Bangalore	7	4	-	-	11	6	-	4	-	10	90.90
S.K. Nagar	6	6	-	2	14	6	-	6	1	13	82.85
Rahuri	8	-	-	-	8	8	-	-	-	8	100.00
Mettupalayam	3	3	-	3	9	3	-	3	-	6	66.66
Bhubaneswar	7	5	-	-	12	6	-	5	-	11	91.66
Ranichauri	13	4	-	3	20	11	-	4	2	17	85.00
Hisar	6	4	-	1	11	6	-	4	1	11	100.00
Ranchi	7	-	-	-	7	7	-	-	-	7	100.00
Ludhiana	4	1	-	-	5	4	-	1	-	5	100.00
Faizabad	6	-	-	-	6	5	-	-	-	5	83.33
Ambikapur	6	-	-	-	6	6	-	-	-	6	100.00
Mandor	4	-	-	1	5	3	-	-	1	4	80.00
Palampur	3	1	-	1	11	7	-	1	-	8	72.72
Sangla	3	1	-	-	4	3	-	1	-	4	100.00
Shimla	10	-	-	2	12	10	-	-	2	12	100.00
Shillong	4	-	-	-	4	4	-	-	-	4	100.00
Almora	3	1	-	-	4	3	-	1	-	4	100.00
Delhi	5	-	-	-	5	5	-	-	-	5	100.00
Bhowali	2	-	-	-	2	2	-	-	-	2	100.00
Total	113	30		13	156	105		30	7	142	91.02

List of Underutilized Crops Identified for Research Work

I. FOOD CROPS

A. PSEUDOCEREALS

Grain Amaranth (*Amaranthus* spp.)
Buckwheat (*Fagopyrum* spp.)
Chenopodium (*Chenopodium* spp.)
Job's tear (*Coix lacryma-jobi*)

B. FOOD LEGUMES/ PULSES

Rice bean (*Vigna umbellata*)
Adzuki bean (*Vigna angularis*)
Faba bean (*Vicia faba*)
Winged bean (*Psophocarpus tetragonolobus*)

C. OILSEEDS

Perilla (*Perilla frutescens*)
Paradise tree (*Simarouba glauca*)

D. VEGETABLES

Kankoda (*Momordica dioica*)
Winged bean (*Psophocarpus tetragonolobus*)
Salt bush (*Atriplex* spp.)

II. FODDER CROPS

Amaranths (*Amaranthus* spp.)
Salt bush (*Atriplex* spp.)
Fodder tree species

III. ENERGY, HYDROCARBON AND INDUSTRIAL PLANTS

Jojoba (*Simmondsia chinensis*)
Guayule (*Parthenium argentatum*)
Jatropha (*Jatropha curcas*)
Tumba (*Citrullus colocynthis*)
Paradise Tree (*Siimarouba glauca*)
Perilla (*Perilla frutescens*)

List of Centres and Names of Scientists working on AICRP Underutilized Crops

	Fax	Phone (O)	Phone (R)
A. COORDINATING UNIT			
1 National Bureau of Plant Genetic Resources, Pusa, New Delhi – 110 012			
Dr. R.P. Dua Nodal Officer	011-25841835	011-25841835	0124-2461666 M.-9911288077
Dr. B.S. Phogat Sr. Scientist (Agronomy)	011-25841835	011-25841835	011-25088241
Dr. Hanuman Lal Scientist (Statistics)	011-25841835	011-25841835	011-25278556 M.-9312839336
Dr. R.S. Rathi Technical Officer	011-25841835	011-25841835	011-25841362 M.-9868737635
B. SAU BASED MAIN CENTRES			
1 University of Agricultural Sciences, Hebbal, Bangalore – 560 024			
Dr. Chikkadevaiah Sr. Scientist (Breeding)	080-23414848	080-23411483 Ext. 39	
Dr. G.N. Dhanpal Jr. Agronomist	080-23414848	080-23411483	
2 Orissa University of Agriculture & Technology, Bhubaneswar – 751 003			
Dr. P.K. Sahu Plant Breeder	0674-2407780	0674-240169, 2402818-13	0674-2569101
Dr. Jena Jr. Agronomist	0674-2407780	0674-240169, 2402818-13	
3 CCS Haryana Agricultural University, Hisar – 125 004			
Dr. C.S. Tyagi Sr. Scientist & Head (MAP & UC)	01662-234952, 234613	01662-237726 Ext. 4283	01662-228308
Dr. J.S. Hooda Plant Breeder			
Dr. R.K. Karwasara Agronomist			

	Fax	Phone (O)	Phone (R)
	Dr. M. Khabiruddin Jr. Phytochemist		
4.	Forest College & Research Institute (TNAU), Mettupalayam – 641 301		
	Dr. K. Kumaran	04254-225064	04254-222010
	M.- 09443377970		
	Dr. K. Bhawani Shankar Asstt. Prof. (Plant Breeding)		
5	Mahatma Phule Agricultural University, Rahuri – 413 722		
	Dr. Nand Kumar Kute	02426-243223	02426-243249
	Plant Breeder		
6	Birsa Agricultural University, Ranchi – 834 006		
	Dr. Chandra Shekar Mehto	0651-2455850	0651-2455621, 2450625
	Sr. Scientist		
7	College of Forestry & Hill Agriculture (GBPUAT), Ranichauri – 249 199		
	Dr. M. Dutta	01376-252138	01376-252121, 252119
	Plant Breeder & TPL (PL. Br.)		
	Dr. T.P. Singh Agronomist		
8	Sardar Krushinagar Dantiwada Agri. Univ. (SDAU), Sardar Krushinagar Distt. Banaskantha – 385 506		
	Dr. Y. Ravinder Babu	02748-278433	02748-279003
	Assoc. Res. Sci. (Pl.Br.)		
	Dr. B.N. Patel Asstt. Res. Sci. (Agronomy)		
9	Punjab Agricultural University, Ludhiana – 141 004		
	Dr. Gurtej Singh Brar	0161-2400945	0161-2401960 Ext. 435
	Ext. Specialist (FC)		
10	Agricultural Research Station (RAU), Mandor, Jodhpur – 342 304		
	Dr. B.R. Choudhary	0291-2571909	0291-2571813
	0291-2571847, 2613869 M.-09414135861		

		Fax	Phone (O)	Phone (R)
11	CSK Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur – 176 062			
	Dr. Rakesh Chahota Asstt. Prof. Plant Breeding	01894-230511	0184-230391	
12	RMD College of Agri. & Research Centre, P.O. Box No. 3, Post Ajmera (Chattisgarh) (IGKV), Ambikapur – 497 001			
	Dr. M.K. Singh Scientist incharge (Underutilized Crops)	07774-230986, 220099	07774-230815, 230986	07774-220069 M.-9425256250
13	Narendra Dev University of Agriculture & Technology, Faizabad – 224 229			
	Dr. C.B. Yadav Scientist incharge Underutilized Crops		05270-262051	05270-220977
C.	COOPERATING CENTRES			
	Dr. V.D. Verma Officer incharge NBPGR Regional Station Shimla	0177-2235453	0177-2235453, 22355459	0177-2235453
	Dr. N.K. Dwivedi Officer incharge NBPGR Regional Station Jodhpur	0291-2740490	0291-2740490	0291-2744162
	Dr. N. Dixit Officer incharge NBPGR Regional Station Akola	0724-2258067	0724-2258067	0724-2421849
	Dr. D.K. Hore Officer incharge NBPGR Regional Station Shillong	0364-2570651	0364-2570193	0364-2570194
	Dr. K.S. Negi Officer incharge NBPGR Regional Station Bhowali	05942-220027	05942-220027	05942-220038
D.	VOLUNTARY CENTRES			
1	National Botanical Research Institute, Lucknow			
	Dr. R.M. Pandey Head, Cytogenetic Lab	0522-205839, 205836	0522-205831- 35, 205848, 205839	

	Fax	Phone (O)	Phone (R)
Dr. Sudhir Shukla Scientist Deptt. Pl. Br. & Gen.			
2 Vivekananda Parvatiya Krishi Anusandhan Shala, Almora			
Dr. Arun Gupta Scientist	05962-231539	05962-230060	
3 Himachal Pradesh Krishi Vishwavidyalay, Palampur			
Dr. K.S. Thakur Assoc. Director Mountain Agricultural Research and Extension Centre (CSK HPKV) Sangla – 172106 Kinnaur Distt. (H.P.)			

VARIETIES RELEASED

CROP	VARIETY	FEATURES	AREA	DEVELOPED BY
Grain amaranth	BGA-2	High grain yield and early maturing	Karnataka, Orissa and Tamil Nadu states	Dr. P.K. Sahu Dr. P.K. Mishra Dr. D. Mohapatra Sh. S.N. Jena Dr. R.C. Misra Dr. C.M. Khanda Sh. G.S. Singh
Buckwheat	Shimla B-1	Early maturing	Mid and high hills of Himachal Pradesh and Uttranchal	Dr. J.C. Rana Dr. V.D. Verma Dr. K. Pradheep Sh. Prakash Chand
	Sangla B-1	High grain Yield and early maturing	Mid and high hills of Himachal Pradesh and Uttranchal	Dr. K.C. Dhiman Dr. R.K. Chahota Dr. S.S. Rana Dr. S.R. Thakur Dr. K.S. Thakur