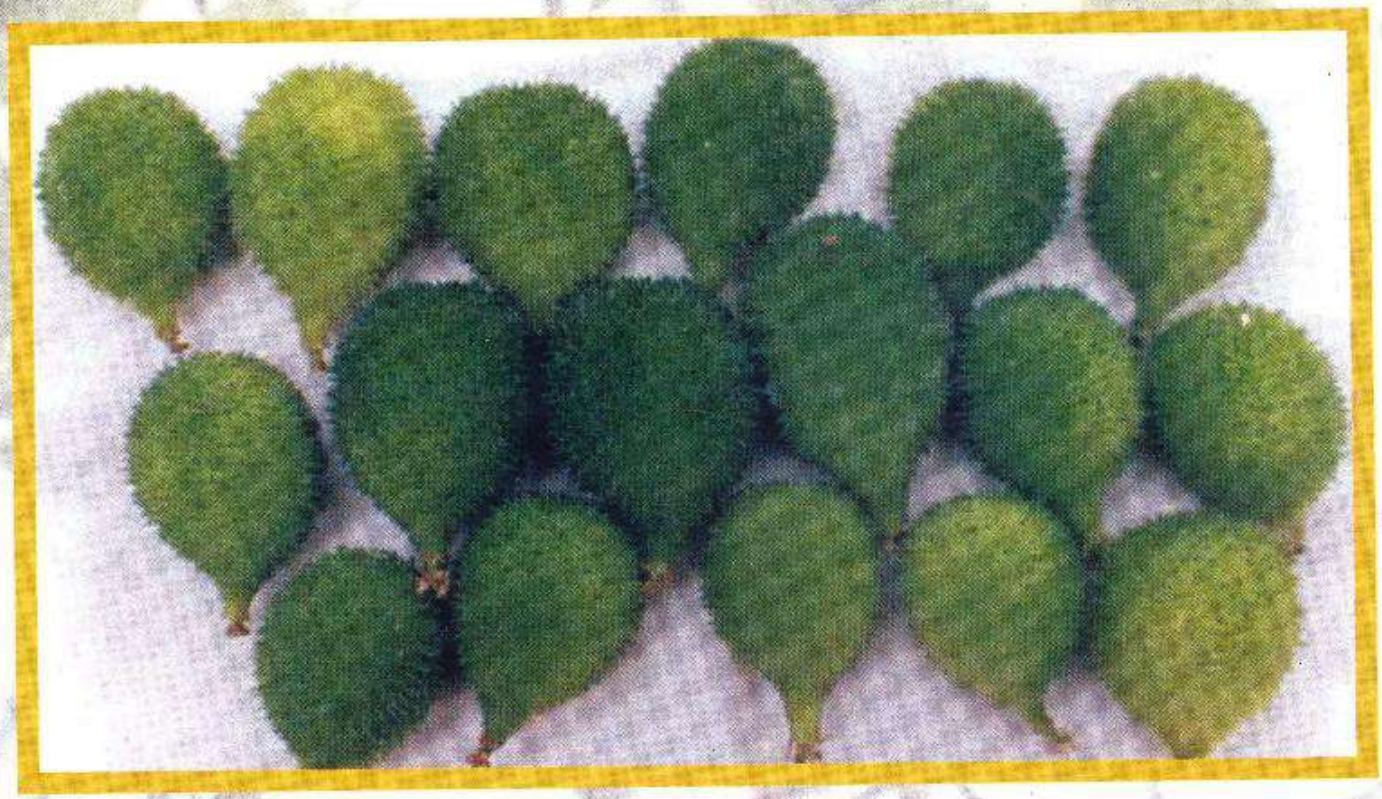
For Official Use Only

ALL INDIA COORDINATED RESEARCH NETWORK ON UNDERUTILIZED CROPS

ANNUAL REPORT 2006



भाकृअनुप
ICAR

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

For Official Use Only

ALL INDIA COORDINATED RESEARCH NETWORK ON UNDERUTILIZED CROPS

PROGRESS REPORT 2006

Compiled By

Dr. Hanuman Lal

Dr. R.P. Dua

Dr. M. Dutta

Dr. B.S. Phogat

Dr. R.S. Rathi

भाकृअनुप
ICAR

NATIONAL BUREAU OF PLANT GENETIC RESOURCES
PUSA CAMPUS, NEW DELHI – 110 012

CONTENTS

		Pages
I	**PREAMBLE**	1-3
II	**PLANT BREEDING**	4-119
	2.1 Hills	4-54
	2.2 Plains	55-119
III	**GERMPLASM EVALUATION**	120-258
	3.1 Hills	120-167
	3.2 Plains	168-258
IV	**QUALITY ANALYSIS**	259-266
V	**AGRONOMY**	267-282
VI	**CENTRE REPORT**	283-287
	6.1 Hills	283-285
	6.2 Plains	286-287
VII	**SUMMARY**	288-294
	ANNEXURES (I – X)	i-xiv

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 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, rapid 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 the 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 which also underlined the need to widen the species composition in the food basket and conserve important food and other plants for 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 recently rechristened as AICRN on Underutilized Crops. At present, the network is conducting research on 17 crops of food, fodder and industrial value through 13 main, 6 cooperating and 3 voluntary centres located in diverse agro-climatic zones of the country. About 31 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 AICRN, 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 Coordinating 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 management and functioning of the project from Dr. Mangala Rai, Director General, ICAR & Secretary, DARE; Dr. S.P. Tiwari, DDG (CS), ICAR; Dr. S.N. Shukla, ADG (FFC), ICAR and Dr. S.K. Sharma, Director, NBPGR.

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

R.P. Dua
Nodal Officer

PLANT BREEDING

II. PLANT BREEDING

On the basis of regional economic importance, area covered by a crop, specific adaptive advantage and future potential, the work on underutilized crops have been prioritized specifically over the years for hilly 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 Trials (AVT-I & II) in important crops like grain amaranth, buckwheat, rice bean and faba bean, multi-locational Observational Rows and Germplasm Screening Nurseries are also conducted in the crops requiring explorative investigation. An account of the experiments conducted during rabi 2005-2006 in plains and during *kharif* 2006, both in hills as well as 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 hills 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 an 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 (lysine) are used for various confectionary items and other food products.

An IVT and AVT was conducted during kharif, 2006. 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 and Advanced Varietal Trial (IVT & AVT)

In this trial, 19 IVT and one AVT entries along with 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 over 5 locations, none of the entries showed grain yield superiority over the best check variety, IC35407.

Significant differences were observed among the entries for seed yield at all the locations (Table 2). Seed yield, level was high at Shimla (43.47 q/ha) and moderate at Sangla (17.37 q/ha), Ranichauri (24.14 q/ha) and Almora (8.44 q/ha); while, it was considerably low at Palampur (2.43 q/ha). Based on the average performance over locations the check IC 35407 was the highest yielder (28.35 q/ha) followed by VL 344 (23.15 q/ha). On individual centres, Annapurna was the highest yielder at Ranichauri (30.74 q/ha), IC38312 at Shimla (54.12 q/ha), RMA19 at Sangla (33.67 q/ha) and IC35407 at Palampur (26.00 q/ha) and Almora (19.29 q/ha).

Average plant height of the entries (Table 3) was the highest at Shimla (299.09 cm) followed by Almora (181.23 cm) and Ranichauri (148.67 cm). It was the lowest at Sangla (116.56 cm) centre. The plant height at Shimla ranged from 243.91 cm to 333.05 cm and at Sangla from 87.87 cm to 137.13 cm. Based on average performance over the five locations PRA 3 had the highest plant height (197.05 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 (68.40 days) at Ranichauri while it was the longest (91.58 cm) at Shimla (Table 4). The variation in flowering time among the entries was wider at Shimla (67.00 – 102.33 days). The check IC 35407 showed consistence for early

flowering over the locations and ranked first (64.83 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 131.78 days (Table 5). The entry, VL-0344 was the earliest in maturity (109.57 days) almost same as that of IC35407 (109.97 days). The average maturity period was the minimum at Sangla (123.14 days) while, it was the longest at Shimla (158.38 days).

The length of inflorescence (Table 6) of the entries was the highest at Shimla (69.34 cm) followed by Almora (57.23 cm) and Ranichauri (50.86 cm). Inflorescence length was the lowest (31.16 cm) at Palampur. Based on the average over four locations IC 423117 had the longest inflorescence (58.00 cm).

Test weight (Table 7) expressed in terms of weight of 10 ml seed recorded at four centres showed that it was the highest at Ranichauri (12.98 g) and low to moderate at Sangla (6.72 g), Shimla (7.62 g) and Almora (7.51 g). The variation among the entries was relatively low. Based on the average over four locations entry, PRA 2006-1 (9.21 g) showed the highest test weight.

Number of fingers per inflorescence (Table 8) was the highest at Sangla (71.29) followed by Shimla centre (56.90). Based on the average over the locations the check variety Annapurna had the highest number of fingers (60.89).

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 Tria and Advanced Varietal Trial (AVT-I)

The combination of Initial Varietal Trial (13 entries) and Advanced Varietal Trial I (three entries) & II (one entry) was conducted with four checks at four locations viz. Shimla, Ranichauri, Almora and Sangla. The summary performance of various entries in respect of grain yield and other important traits as

compared to the checks have been given in Table 9. No entry was found superior in yield to the best check variety, VL 7 (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 and Shimla was comparatively low. Highest yield was recorded at Almora (8.48 q/ha) followed by Ranichauri (4.77 q/ha) and Shimla (4.73 q/ha).

Average plant height (Table 11) was recorded to be the highest at Shimla (149.21 cm) followed by at Almora (113.67 cm). The entry IC 323724 was the tallest (153.73 cm).

Flowering time varied from 28.67 to 75.00 days at Ranichauri, from 44.00 to 74.00 days at Shimla and 21.33 to 42.00 days at Almora centre (Table 12). Mean flowering time was the earliest at Almora (35.92 days) followed by Ranichauri (56.06 days).

Maturity period (Table 13) also showed similar trend as that of flowering time. Average maturity period was the earliest at Almora (76.41 days) followed by Ranichauri (129.24 days). On the basis of average over three locations the check variety VL-7 was earliest in maturity (70.33 days).

The average test weight was recorded to be higher at Ranichauri (2.99 g) than other centres (Table 14). On the basis of average over the locations VL 7 possessed the highest (3.22 g) and IC 382287 the lowest (1.66 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-I

The Initial Varietal Trial and Advanced Varietal Trial comprising eighteen lines was conducted at three centres. The entries comprised of the lines received

from NBPGR Regional Station, Shimla. The performance of the entries has been summarized in table 15. The average grain yield (1.27 q/ha) was low at Palampur (Table 16), while it was the highest at Ranichauri (12.28 q/ha).

Average plant height was the highest at Shimla (242.74 cm) and lowest at Palampur (132.67 cm) centre (Table 17).

Average flowering time varied from 60.47 days at Ranichauri to 87.75 days at Shimla (Table18) and maturity period from 118.16 days at Ranichauri to 143.15 days at Shimla (Table 19). The entry PRC 9801 was earliest in maturity. Inflorescence length showed less variation ranging from 38.75 to 39.44 cm. The entry, MCH 1 (67.15 cm) had longest earhead (Table 20).

2.1.4 RICE BEAN (*Vigna umbellata)*

Rice bean is an important grain legume crop 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 and AVT-I was conducted during the year.

2.1.4.1 Initial Varietal Trial and Advanced Varietal Trial-I

The Initial Varietal Trial and AVT-I comprising 12 entries and four checks was conducted at five locations. Data have been received from all the centres. However, the data in respect of seed yield from Bhowali and Shillong centres were not included due to high C.V. The summary performance of the entries has been presented in table 21.

Significant variations were observed among the entries with respect to grain yield at all the locations (Table 22). Yield level at Ranichauri centre was the highest with an average yield of 12.29 q/ha while it was the lowest (5.75 q/ha) at Palampur centre. The yield level at Almora centre was also low (7.85 q/ha). On the basis of average over five locations LRB 22 (12.04 q/ha) was the highest yielder followed by the check variety PRR 2 (10.17 q/ha).

Plant height (Table 23) was the highest at Ranichauri showing an average of 170.36 cm while it was the lowest at Palampur (84.38 cm) centre. At Almora

centre also plant height was considerably high (167.58 cm). On the basis of average over five locations LRB 23 showed the highest plant height (143.88 cm).

Flowering time was the earliest at Bhowali (55.33 days) and delayed at Palampur (82.89 days) showing more than 27 days difference between the two centres (Table 24). On the basis of average over five locations VRB-1 (65.87 days) showed the earliest flowering.

Maturity period was the earliest at Bhowali (100.89 days) and most delayed (162.02 days) at Ranichauri (Table 25). There was a difference of about 62 days in maturity between Bhowali and Ranichauri centres. Based on the average over five locations PRR 2 was the earliest maturing (116.65 days) variety.

The mean 100-seed weight was the highest at Ranichauri (8.76 g) centre and the lowest at Almora (4.79 g) centre (Table 26). On the basis of average over three locations RBS 16 had the largest seed (9.25 g).

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 Advanced Varietal Trial-I & II was planned to be conducted in adzuki bean at three locations.

2.1.5.1 Initial Varietal Trial and Advanced Varieral Trials (I & II)

The Initial Varietal Trial and Advanced Vareital Trial-I and II comprising 22 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 27.

The average grain yield (Table 28) level at Shimla was the highest (12.04 q/ha), followed by Ranichauri (11.31 q/ha) and was very low at Palampur (4.37 q/ha). The range of variation (4.26 – 17.79 q/ha) in seed yield was very high at Shimla. Significant differences were, observed for seed yield of the entries at all the locations. On the basis of three locations data HPU 51 (12.36 q/ha) was the highest yielding entry.

Plant height (Table 29) was the highest at Shimla (65.82 cm) followed by Palampur (48.44 cm). Based on the average over the locations the entry, SMLAB-1 had the maximum plant height (62.08 cm).

Flowering time (Table 30) was the earliest at Palampur (48.74 days) followed by Shimla (58.71 days). Considerable variation was observed in flowering time of the lines at all the centres. It ranged from 49.67 to 65.3 days at Shimla and 54.33 to 72.67 days at Ranichauri. Based on the overall average, the entry EC 15257 was the earliest in flowering time (53.22 days).

Maturity period (Table 31) of the entries also showed similar trend as was observed for flowering time. Entries took minimum time (86.21 days) to mature at Palampur and maximum at Ranichauri (121.45 days). Based on the average over the locations the entry, EC 254 (101.67 days) was the earliest maturing entry followed by the entry IC 340263 (102.56 days).

The average test weight (100-seed weight) was the highest (Table 32) at Ranichauri (12.58 g) followed by at Shimla (10.04 g). The entry EC 340271 (12.93 g) had the highest seed weight based on the average over locations.

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 have been received only from Palampur.

2.1.6.1 Initial Varietal Trial

The Initial Varietal Trial on eight lines including two checks was conducted at both the centres. The performance of the entries has been summarized in Table 33. The seed yield (Table 34) was very low and varied from 0.46 to 1.14 q/ha. HB-611 had the highest seed yield (1.14 q/ha).

Average plant height was maximum for HB-613 (54.03 cm) and lowest for ISVIO-2 (37.60 cm). ISVIO-2 had earliest flowering time (103.75 days) and maturity period (160.00 days).

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. Initial varietal Trial was proposed to be conducted in this crop at three locations and the summary of data have been presented in table 35.

Seed yield ws the highest at Shillong (11.49 q/ha) followed by Palampur (5.41 q/ha) and Ranichauri (3.77 q/ha) centre (Table 36).

Fresh and dry forage yield varied from 220.83 to 633.89 q/ha and 48.61 to 209.22 q/ha respectively (Table 37). Plant height was the highest at Shillong centre (423.37 cm) and followed by Palampur (211.00 cm) centre (Table 38). Days to flowering was the earliest at Ranichauri (108.13 days) centre (Table 39) followed by Shillong (109.57 days) while maturity period was the earliest (168.97 days) at Shillong (Table 40). Test weight was the highest at Shillong (9.95 g) and low at Ranichauri (5.14 g) centre (Table 41).

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 an Initial Varietal Trial was proposed to be conducted at two hill locations. The summary of performance of the entries are presented in table 42. The grain yield and other characters have been presented in table 43. The grain yield varied from 3.72 to 15.26 q/ha.

Table 1. Performance of Grain Amaranth entries in Initial and Advanced Varietal Trials (IVT & AVT) during 2006 (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 qualifying variety			
				Mean	Location	Rank	Annapurna	PRA 2	PRA 3	IC035407
	IVT									
1	IC021810	133.47	8.78	19.46	5	12	-14.80	-9.03	-0.84	-31.36
2	IC037148	133.93	8.62	18.74	5	13	-17.94	-12.38	-1.18	-33.89
3	IC037153	133.47	8.60	17.88	5	15	-21.73	-16.42	-1.58	-36.94
4	IC038312	135.60	8.91	21.83	5	5	-4.42	2.06	0.28	-23.00
5	IC042006	131.97	8.74	16.53	5	19	-27.64	-22.74	-2.22	-41.70
6	IC042264-16	137.17	8.80	13.69	5	22	-40.06	-36.00	-3.55	-51.71
7	IC042265-2	133.87	8.81	21.33	5	9	-6.63	-0.30	0.04	-24.78
8	IC042284-5	136.90	8.87	21.79	5	6	-4.59	1.87	0.26	-23.14
9	IC095253	133.30	8.57	15.76	5	20	-31.02	-26.34	-2.58	-44.43
10	IC095284	131.17	8.69	16.54	5	18	-27.60	-22.70	-2.22	-41.67
11	IC095301	134.40	8.79	14.70	5	21	-35.63	-31.26	-3.08	-48.14
12	IC095341	134.40	8.60	21.74	5	7	-4.82	1.63	0.23	-23.32
13	IC423117	132.27	8.58	22.65	5	4	-0.83	5.90	0.66	-20.10
14	IC467887	119.70	8.82	18.30	5	14	-19.88	-14.45	-1.38	-35.45
15	IC467896	130.63	8.44	16.88	5	17	-26.11	-21.10	-2.05	-40.47
16	PRA-2006-1	135.07	9.21	17.74	5	16	-22.32	-17.05	-1.65	-37.42
17	PRA-2006-2	134.13	8.52	19.92	5	11	-12.79	-6.88	-0.62	-29.74
18	RMA-19	132.00	8.65	12.63	4	23	-44.71	-40.96	-4.05	-55.45
19	RMA-24	138.42	9.01	7.55	3	24	-66.96	-64.72	-6.45	-73.38
	AVT-I									
20	VL-0344	109.57	8.66	23.15	5	2	1.35	8.22	0.90	-18.35
21	Annapurna (C)	131.80	8.84	22.84	5	3	0.00	6.78	0.75	-19.43
22	PRA-2 (C)	130.70	8.90	21.39	5	8	-6.37	0.00	0.07	-24.57
23	PRA-3 (C)	130.60	8.43	21.24	5	10	-7.01	-0.71	0.00	-25.08
24	IC035407 (C)	109.97	**8.51**	**28.35**	5	1	24.11	32.53	3.35	0.00
	Mean	131.78	8.60	19.17						

Table 2. Grain yield (q/ha) in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Almora	Ranichauri	Shimla	Palampur	Sangla	Mean	Rank	Location	Frequency
	IVT									
1	IC021810	7.54	24.81	45.36	0.08	19.50	19.46	12	5	0/5
2	IC037148	6.50	26.66	43.19	2.36	15.00	18.74	13	5	0/5
3	IC037153	8.33	30.07	41.57	1.14	8.28	17.88	15	5	0/5
4	IC038312	12.02	29.85	***54.12***	0.28	12.89	21.83	5	5	1/5
5	IC042006	6.35	25.18	37.21	0.56	13.33	16.53	19	5	0/5
6	IC042264-16	6.36	11.11	35.45	1.25	14.28	13.69	22	5	0/5
7	IC042265-2	9.00	30.44	45.03	2.39	19.78	21.33	9	5	0/5
8	IC042284-5	8.58	26.51	46.66	1.69	***25.50***	21.79	6	5	1/5
9	IC095253	7.58	20.37	40.25	0.35	10.22	15.76	20	5	0/5
10	IC095284	5.42	21.85	37.91	0.72	16.78	16.54	18	5	0/5
11	IC095301	3.46	21.85	31.82	1.94	14.44	14.70	21	5	0/5
12	IC095341	7.25	25.18	45.29	1.36	***29.61***	21.74	7	5	1/5
13	IC423117	10.81	29.40	46.68	0.19	***26.17***	22.65	4	5	1/5
14	IC467887	10.69	17.40	44.55	0.08	18.78	18.30	14	5	0/5
15	IC467896	7.27	19.33	42.90	0.50	14.39	16.88	17	5	0/5
16	PRA-2006-1	6.73	26.66	41.13	0.14	14.06	17.74	16	5	0/5
17	PRA-2006-2	4.44	26.66	46.46	0.47	21.56	19.92	11	5	0/5
18	RMA-19	2.10	13.11	-	1.64	***33.67***	12.63	23	4	1/4
19	RMA-24	-	17.03	-	0.67	4.94	7.55	24	3	0/3
	AVT - I									
20	VL-0344	21.63	25.77	41.77	17.24	9.33	23.15	2	5	0/5
21	Annapurna (C)	7.21	**30.74**	49.91	7.18	19.17	22.84	3	5	
22	PRA-2 (C)	7.42	28.26	48.36	6.89	16.00	21.39	8	5	
23	PRA-3 (C)	8.17	26.29	47.33	6.68	17.72	21.24	10	5	
24	IC035407 (C)	**19.29**	24.81	**50.19**	**26.00**	**21.44**	28.35	1	5	
	Mean	**8.44**	**24.14**	**43.47**	**2.43**	**17.37**	**19.17**			
	CD (0.05)	**3.42**	**1.61**	**2.01**	**0.45**	**2.45**				
	CV (%) Error	**19.58**	**4.16**	**2.88**	**8.23**	**8.82**				

Table 3. Plant height (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Almora	Ranichauri	Shimla	Palampur	Sangla	Mean	Rank
	IVT							
1	IC021810	199.00	159.88	312.14	128.33	123.13	184.50	5
2	IC037148	185.50	159.30	333.05	122.67	124.53	185.01	4
3	IC037153	166.00	152.15	313.30	115.33	109.13	171.18	17
4	IC038312	184.00	147.00	305.97	127.67	116.53	176.23	14
5	IC042006	183.00	151.35	302.35	123.00	106.07	173.15	16
6	IC042264-16	180.00	155.35	325.02	136.33	123.80	184.10	6
7	IC042265-2	190.50	152.95	326.53	115.67	124.53	182.04	9
8	IC042284-5	176.00	159.50	328.65	125.67	122.20	182.40	8
9	IC095253	212.50	149.55	296.60	116.00	107.80	176.49	13
10	IC095284	158.00	140.93	266.23	139.33	113.93	163.69	20
11	IC095301	153.50	141.10	278.76	129.33	115.93	163.73	19
12	IC095341	192.50	159.13	313.36	126.33	111.87	180.64	10
13	IC423117	185.50	155.05	328.34	123.33	104.73	179.39	11
14	IC467887	163.00	135.70	270.93	130.33	98.60	159.71	22
15	IC467896	198.50	150.63	307.69	131.00	132.07	183.98	7
16	PRA-2006-1	187.50	141.88	256.24	119.33	137.13	168.42	18
17	PRA-2006-2	135.50	142.87	274.34	140.00	111.60	160.86	21
18	RMA-19	179.00	146.53	-	131.33	121.13	144.50	24
19	RMA-24	200.50	149.37	-	132.00	118.67	150.13	23
	AVT-I							
20	VL-0344	181.00	122.08	243.91	220.73	119.00	177.34	12
21	Annapurna (C)	168.00	**168.73**	276.53	215.40	115.13	188.76	3
22	PRA-2 (C)	**203.00**	143.18	303.92	210.87	122.93	196.78	2
23	PRA-3 (C)	197.50	152.93	**317.10**	**229.87**	87.87	197.05	1
24	IC035407 (Durga) (C)	170.00	130.95	252.00	191.80	**129.10**	174.77	15
	Mean	**181.23**	**148.67**	**299.09**	**143.04**	**116.56**	**177.72**	
	CD (0.05)	**31.88**	**24.23**	**28.66**	**28.12**	**42.14**		
	CV (%) Error	**8.50**	**10.18**	**6.03**	**12.11**	**22.59**		

Table 4. Days to 50% flowering in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Almora	Ranichauri	Shimla	Palampur	Sangla	Mean	Rank
	IVT							
1	IC021810	75.00	71.67	89.67	88.00	82.00	81.27	15
2	IC037148	92.50	71.67	90.67	80.67	86.00	84.30	18
3	IC037153	74.50	66.33	89.00	76.00	82.00	77.57	6
4	IC038312	75.50	66.33	91.67	90.33	82.00	81.17	14
5	IC042006	92.00	67.33	100.67	80.67	82.00	84.53	21
6	IC042264-16	85.50	72.00	101.33	81.33	82.00	84.43	20
7	IC042265-2	74.50	62.00	98.33	79.67	82.00	79.30	9
8	IC042284-5	74.50	71.33	94.33	83.67	81.00	80.97	13
9	IC095253	83.00	69.00	96.67	89.00	86.00	84.73	23
10	IC095284	79.00	71.00	84.33	80.67	80.00	79.00	8
11	IC095301	82.50	76.33	97.67	80.33	80.00	83.37	17
12	IC095341	79.50	75.33	102.00	82.67	85.00	84.90	24
13	IC423117	74.50	62.33	99.67	88.00	78.00	80.50	11
14	IC467887	62.00	***52.00***	73.33	81.67	77.00	69.20	3
15	IC467896	75.00	55.00	82.00	90.33	82.00	76.87	4
16	PRA-2006-1	83.50	74.67	88.67	61.00	82.00	77.97	7
17	PRA-2006-2	86.00	76.33	84.00	60.00	80.00	77.27	5
18	RMA-19	95.50	82.00	-	83.00	78.00	84.63	22
19	RMA-24	93.50	83.67	-	60.00	85.00	80.54	12
	AVT-I							
20	VL-0344	60.50	***50.33***	77.67	58.67	77.67	64.97	2
21	Annapurna (C)	82.00	76.33	101.67	80.00	82.00	84.40	19
22	PRA-2 (C)	82.50	66.33	102.00	73.00	**76.00**	79.97	10
23	PRA-3 (C)	82.00	67.33	102.33	74.00	85.00	82.13	16
24	IC035407 (Durga) (C)	**64.50**	**55.00**	**67.00**	**59.67**	78.00	64.83	1
	Mean	**79.56**	**68.40**	**91.58**	**77.60**	**81.28**	**79.53**	
	CD (0.05)	**4.83**	**1.54**	**1.11**	**8.65**	**1.16**		
	CV (%) Error	**2.94**	**1.40**	**0.76**	**6.97**	**0.89**		

Table 5. Days to maturity in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Almora	Ranichau	Shimla	Palampur	Sangla	Mean	Rank	Location	Frequency
	IVT									
1	IC021810	127.00	137.33	156.33	127.33	119.33	133.47	14	5	0/5
2	IC037148	129.00	131.33	158.00	126.67	124.67	133.93	16	5	0/5
3	IC037153	126.00	133.33	157.67	125.67	124.67	133.47	13	5	0/5
4	IC038312	127.00	136.67	158.00	131.00	125.33	135.60	21	5	0/5
5	IC042006	129.50	123.67	159.00	125.67	122.00	131.97	9	5	0/5
6	IC042264-16	126.50	128.00	161.33	137.67	132.33	137.17	23	5	0/5
7	IC042265-2	126.00	128.00	158.67	126.67	130.00	133.87	15	5	0/5
8	IC042284-5	127.50	137.33	161.00	131.67	127.00	136.90	22	5	0/5
9	IC095253	128.50	127.33	160.33	126.33	124.00	133.30	12	5	0/5
10	IC095284	123.50	112.33	158.67	137.33	124.00	131.17	7	5	0/5
11	IC095301	127.00	133.33	158.67	125.33	127.67	134.40	18	5	0/5
12	IC095341	126.00	132.67	159.00	126.33	128.00	134.40	19	5	0/5
13	IC423117	124.00	122.67	158.33	133.33	123.00	132.27	11	5	0/5
14	IC467887	97.50	***92.00***	157.33	128.33	123.33	119.70	3	5	1/5
15	IC467896	124.50	121.67	158.00	131.33	117.67	130.63	5	5	0/5
16	PRA-2006-1	128.00	137.33	159.67	132.00	118.33	135.07	20	5	0/5
17	PRA-2006-2	125.00	138.00	159.67	126.33	121.67	134.13	17	3	0/3
18	RMA-19	-	138.00	-	132.00	126.00	132.00	10	4	0/4
19	RMA-24	156.00	140.00	-	134.33	123.33	138.42	24	4	0/4
	AVT-I									
20	VL-0344	95.50	***96.67***	148.67	92.00	***115.00***	109.57	1	5	2/5
21	Annapurna (C)	125.00	122.33	157.67	134.00	120.00	131.80	8	5	
22	PRA-2 (C)	125.50	118.00	159.67	131.33	119.00	130.70	6	5	
23	PRA-3 (C)	125.00	116.33	160.33	130.33	121.00	130.60	4	5	
24	IC035407 (Durga) (C)	**95.50**	**102.33**	**141.00**	**93.00**	**118.00**	109.97	2	5	
	Mean	**123.70**	**125.28**	**158.38**	**128.39**	**123.14**	**131.78**			
	CD (0.05)	**5.14**	**1.53**	**2.51**	**8.51**	**2.30**				
	CV (%) Error	**2.01**	**0.77**	**1.00**	**4.19**	**1.17**				

Table 6. Inflorescence length (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Almora	Ranichauri	Shimla	Palampur	Mean	Rank
	IVT						
1	IC021810	59.50	58.20	68.46	28.67	53.71	8
2	IC037148	50.00	53.75	71.61	25.67	50.26	18
3	IC037153	63.00	52.33	71.17	24.67	52.79	10
4	IC038312	67.00	52.02	68.57	30.67	54.56	5
5	IC042006	54.00	50.08	65.15	28.00	49.31	19
6	IC042264-16	58.50	46.82	68.56	33.00	51.72	12
7	IC042265-2	70.00	48.77	78.04	23.00	54.95	4
8	IC042284-5	55.50	60.82	78.66	23.00	54.50	6
9	IC095253	60.00	42.47	73.11	30.67	51.56	13
10	IC095284	54.00	47.57	68.30	32.00	50.47	16
11	IC095301	48.50	48.13	70.35	26.67	48.41	21
12	IC095341	54.50	53.43	72.38	23.33	50.91	14
13	IC423117	64.00	57.67	***79.34***	31.00	58.00	1
14	IC467887	62.50	56.92	64.71	30.00	53.53	9
15	IC467896	65.50	54.95	70.07	32.67	55.80	3
16	PRA-2006-1	61.00	46.40	64.97	29.00	50.34	17
17	PRA-2006-2	43.50	48.03	63.70	35.00	47.56	22
18	RMA-19	49.50	52.27	-	32.67	44.81	23
19	RMA-24	58.00	46.53	-	29.00	44.51	24
	AVT-I						
20	VL-0344	58.00	39.73	62.64	48.60	52.24	11
21	Annapurna (C)	**59.00**	**59.93**	64.50	**42.67**	**56.52**	2
22	PRA-2 (C)	56.50	45.83	62.39	38.73	50.86	15
23	PRA-3 (C)	57.50	52.82	**69.48**	37.93	54.43	7
24	IC035407 (Durga) (C)	44.00	45.07	66.83	40.07	48.99	20
	Mean	**57.23**	**50.86**	**69.34**	**31.16**	**52.15**	
	CD (0.05)	**12.33**	**14.68**	**9.25**	**12.16**		
	CV (%) Error	**10.41**	**18.04**	**8.35**	**24.10**		

Table 7. Seed weight (g/10ml) in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Almora	Ranichauri	Shimla	Palampur	Sangla	Mean	Rank
	IVT							
1	IC021810	7.30	13.12	***8.02***	-	6.67	8.78	9
2	IC037148	7.05	***13.40***	7.70	-	6.33	8.62	17
3	IC037153	7.35	12.91	7.46	-	6.67	8.60	14
4	IC038312	7.45	12.89	***7.98***	-	7.33	8.91	4
5	IC042006	7.75	12.91	***7.96***	-	6.33	8.74	13
6	IC042264-16	7.45	13.04	***8.03***	-	6.67	8.80	7
7	IC042265-2	7.70	12.77	7.77	-	7.00	8.81	6
8	IC042284-5	7.80	12.84	***7.86***	-	7.00	8.87	5
9	IC095253	7.45	13.11	7.07	-	6.67	8.57	16
10	IC095284	7.45	***13.58***	7.72	-	6.00	8.69	18
11	IC095301	7.65	13.03	7.81	-	6.67	8.79	8
12	IC095341	7.55	12.42	7.42	-	7.00	8.60	12
13	IC423117	7.65	12.88	7.44	-	6.33	8.58	20
14	IC467887	7.75	***13.80***	7.37	-	6.33	8.82	11
15	IC467896	7.15	12.77	7.49	-	6.33	8.44	23
16	PRA-2006-1	7.95	12.92	***7.95***	-	8.00	9.21	1
17	PRA-2006-2	7.55	12.89	7.32	-	6.33	8.52	21
18	RMA-19	6.80	12.82	-	-	6.33	8.65	22
19	RMA-24	-	12.35	-	-	5.67	9.01	24
	AVT - I	-	-	-	-			
20	VL-0344	8.00	13.32	7.21	8.09	6.67	8.66	10
21	Annapurna (C)	7.50	**13.32**	**7.63**	8.09	7.67	8.84	3
22	PRA-2 (C)	**7.90**	12.99	7.30	8.29	**8.00**	8.90	2
23	PRA-3 (C)	7.15	12.63	7.47	8.22	6.67	8.43	19
24	IC035407 (Durga) (C)	7.35	12.88	7.36	**8.31**	6.67	8.51	15
	Mean	**7.51**	**12.98**	**7.62**	**8.17**	**6.72**	**8.60**	
	CD (0.05)	**0.76**	**0.02**	**0.19**	-	**1.24**		
	CV (%) Error	**4.89**	**0.08**	**1.58**	-	**11.50**		

Table 8. Number of fingres per inflorescense in Initial and Advanced Varietal Trials (IVT & AVT) on Grain Amaranth: 2006 (Hills)

S. No.	Genotypes	Ranichauri	Shimla	Sangla	Mean	Rank
	IVT					
1	IC021810	45.00	58.57	73.63	59.07	5
2	IC037148	33.67	57.55	72.33	54.52	13
3	IC037153	36.07	57.44	74.47	55.99	11
4	IC038312	29.73	52.55	80.93	54.41	9
5	IC042006	33.20	51.22	67.60	50.67	19
6	IC042264-16	29.42	51.33	81.07	53.94	10
7	IC042265-2	32.90	49.89	85.47	56.08	3
8	IC042284-5	45.93	52.00	79.53	59.15	2
9	IC095253	35.40	49.78	75.20	53.46	14
10	IC095284	36.82	56.88	75.87	56.52	8
11	IC095301	34.07	53.89	66.80	51.58	17
12	IC095341	35.68	***73.55***	61.33	56.86	15
13	IC423117	33.40	***69.33***	71.93	58.22	7
14	IC467887	35.63	54.78	65.07	51.83	18
15	IC467896	34.47	57.77	80.33	57.52	4
16	PRA-2006-1	30.95	52.17	60.93	48.02	22
17	PRA-2006-2	36.02	48.98	72.13	52.38	16
18	RMA-19	30.87	-	65.93	48.40	20
19	RMA-24	30.13	-	77.73	53.93	6
	AVT-I					
20	VL-0344	25.00	***80.69***	39.20	48.30	24
21	Annapurna (C)	**39.33**	**57.33**	**86.00**	60.89	1
22	PRA-2 (C)	32.20	52.66	65.60	50.15	21
23	PRA-3 (C)	34.73	56.55	75.40	55.56	12
24	IC035407 (Durga) (C)	28.20	49.44	56.40	44.68	23
	Mean	**34.12**	**56.90**	**71.29**	**54.10**	
	CD (0.05)	**12.31**	**8.26**	**23.95**		
	CV (%) Error	**22.55**	**9.12**	**20.99**		

Table 9. Performance of Buckwheat entries in Initial and Advanced Varietal Trials (IVT & AVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean weight of 100 seed (g)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety			
				Mean	Location	Rank	Himpriya	PRB-1	Shimla B-1	VL-7
	IVT									
1	EC323729	110.22	2.48	6.93	3	7	-15.48	30.27	-9.64	-20.06
2	IC261963	65.33	1.77	13.29	1	1	62.06	149.79	73.26	53.27
3	IC266947	67.00	1.67	12.93	1	2	57.72	143.11	68.62	49.17
4	IC272442	114.67	2.25	5.07	3	16	-38.18	-4.72	-33.91	-41.54
5	IC274438	114.67	1.97	5.41	3	12	-34.01	1.71	-29.45	-37.59
6	IC310045	119.22	2.10	5.75	3	10	-29.93	8.00	-25.09	-33.73
7	IC310095	109.56	2.15	3.90	3	20	-52.43	-26.67	-49.14	-55.01
8	IC323724	113.56	2.54	5.54	3	11	-32.43	4.15	-27.76	-36.09
9	IC329456	122.89	2.08	5.28	3	14	-35.61	-0.76	-31.17	-39.10
10	IC341593	106.67	2.05	4.59	3	19	-44.04	-13.75	-40.18	-47.08
11	IC341674	122.22	2.24	6.36	3	9	-22.45	19.53	-17.10	-26.66
12	IC341679	122.22	1.67	4.74	3	17	-42.20	-10.91	-38.21	-45.33
13	IC382287	125.56	1.66	5.08	3	15	-38.11	-4.60	-33.83	-41.46
	AVT-I									
14	IC274439	124.56	2.02	6.70	3	8	-18.29	25.94	-12.65	-22.72
15	SMLBW-4	108.56	2.11	3.85	3	21	-53.00	-27.56	-49.75	-55.55
16	SMLBW-5	121.78	2.40	6.98	3	6	-14.90	31.17	-9.02	-19.51
	AVT-II									
17	SMLBW-3	123.33	1.94	4.68	3	18	-42.92	-12.02	-38.98	-46.02
18	Himpriya (C)	125.00	2.32	8.20	3	4	0.00	54.10	6.89	-5.44
19	PRB-1 (C)	120.56	2.20	5.32	3	13	-35.13	0.00	-30.65	-38.65
20	Shimla B-1 (C)	77.44	2.09	7.67	3	5	-6.47	44.16	0.00	-11.54
21	VL-7 (C)	70.33	3.22	8.67	3	3	5.69	62.90	12.99	0.00
	Mean	**113.77**	**2.18**	**5.99**						

Table 10. Grain yield (q/ha) in Initial and Advanced Varietal Trials (IVT & AVT) on Buckwheat: 2006 (Hills)

S.No.	Genotypes	Almora	Shimla	Ranichauri	Mean	Rank	Location	Frequency
	IVT							
1	EC323729	9.59	5.01	6.20	6.93	7	3	0/3
2	IC261963	13.29	-	-	13.29	1	1	0/1
3	IC266947	12.93	-	-	12.93	2	1	0/1
4	IC272442	5.87	5.18	4.16	5.07	16	3	0/3
5	IC274438	8.59	4.41	3.23	5.41	12	3	0/3
6	IC310045	7.87	4.28	5.09	5.75	10	3	0/3
7	IC310095	5.50	4.36	1.84	3.90	20	3	0/3
8	IC323724	6.39	4.41	5.83	5.54	11	3	0/3
9	IC329456	7.16	5.13	3.56	5.28	14	3	0/3
10	IC341593	6.65	4.99	2.12	4.59	19	3	0/3
11	IC341674	8.83	5.35	4.90	6.36	9	3	0/3
12	IC341679	4.89	4.75	4.58	4.74	17	3	0/3
13	IC382287	5.82	5.43	3.97	5.08	15	3	0/3
	AVT-I							
14	IC274439	10.00	4.18	5.92	6.70	8	3	0/3
15	SMLBW-4	1.88	5.70	3.98	3.85	21	3	0/3
16	SMLBW-5	11.59	4.26	5.09	6.98	6	3	0/3
	AVT-II							
17	SMLBW-3	5.68	4.80	3.56	4.68	18	3	0/3
18	Himpriya (C)	12.28	**5.28**	7.03	8.20	4	3	0/3
19	PRB-1 (C)	4.31	4.24	**7.40**	5.32	13	3	0/3
20	Shimla B-1 (C)	10.68	5.02	7.31	7.67	5	3	0/3
21	VL-7 (C)	**18.39**	3.18	4.44	8.67	3	3	0/3
	Mean	**8.48**	**4.73**	**4.77**	**5.99**			
	CD (0.05)	**2.66**	**0.61**	**1.04**				
	CV (%) Error	**19.58**	**8.10**	**13.74**				

Table 11. Plant height (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Buckwheat: 2006 (Hills)

S.No.	Genotypes	Almora	Shimla	Ranichauri	Mean	Rank
	IVT					
1	EC323729	141.00	***200.87***	117.53	153.13	2
2	IC261963	120.33	-	-	120.33	14
3	IC266947	130.00	-	-	130.00	6
4	IC272442	134.67	***194.22***	106.87	145.25	3
5	IC274438	107.33	149.43	123.07	126.61	9
6	IC310045	108.33	151.88	123.40	127.87	8
7	IC310095	103.33	144.88	100.30	116.17	15
8	IC323724	147.00	***184.13***	130.07	153.73	1
9	IC329456	102.33	115.30	113.33	110.32	17
10	IC341593	80.67	118.23	97.98	98.96	21
11	IC341674	103.67	152.27	105.67	120.53	13
12	IC341679	100.33	128.85	99.00	109.39	18
13	IC382287	98.00	119.45	92.48	103.31	20
	AVT-I					
14	IC274439	108.67	172.95	106.40	129.34	7
15	SMLBW-4	114.00	144.82	117.53	125.45	10
16	SMLBW-5	109.67	149.88	102.67	120.74	12
	AVT-II					
17	SMLBW-3	94.67	115.30	114.13	108.03	19
18	Himpriya (C)	112.67	140.62	114.93	122.74	11
19	PRB-1 (C)	**146.67**	**168.38**	114.12	143.06	4
20	Shimla B-1 (C)	118.67	139.65	**132.50**	130.27	5
21	VL-7 (C)	105.00	143.85	86.33	111.73	16
	Mean	**113.67**	**149.21**	**111.78**	**124.88**	
	CD (0.05)	**16.44**	**14.32**	**25.15**		
	CV (%) Error	**9.04**	**6.00**	**14.23**		

Table 12. Days to 50% flowering in Initial and Advanced Varietal Trials (IVT & AVT) on Buckwheat: 2006 (Hills)

S.No.	Genotypes	Almora	Shimla	Ranichauri	Mean	Rank
	IVT					
1	EC323729	24.00	49.00	37.33	36.78	4
2	IC261963	30.00	-	-	30.00	2
3	IC266947	28.33	-	-	28.33	1
4	IC272442	27.00	49.33	37.67	38.00	5
5	IC274438	42.00	63.00	54.33	53.11	10
6	IC310045	42.00	70.67	60.00	57.56	17
7	IC310095	41.33	72.00	54.33	55.89	13
8	IC323724	27.33	51.00	39.00	39.11	7
9	IC329456	38.67	69.67	59.33	55.89	14
10	IC341593	39.00	60.00	48.00	49.00	9
11	IC341674	41.33	63.33	64.67	56.44	15
12	IC341679	39.67	63.33	59.33	54.11	11
13	IC382287	40.67	64.00	65.00	56.56	16
	AVT-I					
14	IC274439	40.67	72.67	69.67	61.00	20
15	SMLBW-4	42.00	62.00	59.67	54.56	12
16	SMLBW-5	41.00	64.67	75.00	60.22	19
	AVT-II					
17	SMLBW-3	39.67	63.67	70.33	57.89	18
18	Himpriya (C)	39.67	74.00	74.67	62.78	21
19	PRB-1 (C)	32.00	51.00	47.00	43.33	8
20	Shimla B-1 (C)	36.67	44.67	33.67	38.33	6
21	VL-7 (C)	**21.33**	**44.00**	**28.67**	31.33	3
	Mean	**35.92**	**60.63**	**56.06**	**50.87**	
	CD (0.05)	**1.94**	**1.91**	**1.43**		
	CV (%) Error	**3.37**	**1.97**	**1.64**		

Table 13. Days to maturity in Initial and Advanced Varietal Trials (IVT & AVT) on Buckwheat: 2006 (Hills)

S.No.	Genotypes	Almora	Shimla	Ranichauri	Mean	Rank	Location	Frequency
	IVT							
1	EC323729	62.67	143.00	125.00	110.22	8	3	0/3
2	IC261963	65.33	-	-	65.33	1	1	0/1
3	IC266947	67.00	-	-	67.00	2	1	0/1
4	IC272442	71.67	148.00	124.33	114.67	11	3	0/3
5	IC274438	86.00	143.67	114.33	114.67	10	3	0/3
6	IC310045	83.67	134.67	139.33	119.22	12	3	0/3
7	IC310095	83.67	135.67	109.33	109.56	7	3	0/3
8	IC323724	74.67	140.33	125.67	113.56	9	3	0/3
9	IC329456	80.33	149.00	139.33	122.89	17	3	0/3
10	IC341593	70.67	134.33	115.00	106.67	5	3	0/3
11	IC341674	85.00	136.00	145.67	122.22	16	3	0/3
12	IC341679	81.33	146.67	138.67	122.22	15	3	0/3
13	IC382287	82.67	147.67	146.33	125.56	21	3	0/3
	AVT-I							
14	IC274439	79.33	148.33	146.00	124.56	19	3	0/3
15	SMLBW-4	80.33	134.00	111.33	108.56	6	3	0/3
16	SMLBW-5	84.00	136.67	144.67	121.78	14	3	0/3
	AVT-II							
17	SMLBW-3	81.00	149.00	140.00	123.33	18	3	0/3
18	Himpriya (C)	81.67	149.33	144.00	125.00	20	3	
19	PRB-1 (C)	81.33	149.00	131.33	120.56	13	3	
20	Shimla B-1 (C)	68.33	78.00	86.00	77.44	4	3	
21	VL-7 (C)	**54.00**	**74.33**	**82.67**	70.33	3	3	
	Mean	**76.41**	**135.67**	**129.24**	**113.77**			
	CD (0.05)	**5.59**	**3.63**	**1.24**				
	CV (%) Error	**4.57**	**1.67**	**0.61**				

Table 14. 100 seed weight (g) in Initial and Advanced Varietal Trials (IVT & AVT) on Buckwheat: 2006 (Hills)

S.No.	Genotypes	Almora	Shimla	Ranichauri	Mean	Rank
	IVT					
1	EC323729	1.90	2.56	2.97	2.48	3
2	IC261963	1.77	-	-	1.77	18
3	IC266947	1.67	-	-	1.67	20
4	IC272442	1.90	2.17	2.68	2.25	6
5	IC274438	1.37	1.98	2.56	1.97	16
6	IC310045	1.43	2.01	2.86	2.10	11
7	IC310095	1.43	2.05	2.95	2.15	9
8	IC323724	1.77	2.50	3.34	2.54	2
9	IC329456	1.20	1.40	3.63	2.08	13
10	IC341593	1.63	1.77	2.75	2.05	14
11	IC341674	1.50	1.91	3.30	2.24	7
12	IC341679	1.03	1.43	2.54	1.67	19
13	IC382287	1.03	1.39	2.55	1.66	21
	AVT-I					
14	IC274439	1.27	1.72	3.08	2.02	15
15	SMLBW-4	1.40	2.00	2.93	2.11	10
16	SMLBW-5	1.60	2.15	3.45	2.40	4
	AVT-II					
17	SMLBW-3	1.17	1.57	3.10	1.94	17
18	Himpriya (C)	1.63	2.07	3.27	2.32	5
19	PRB-1 (C)	1.53	2.07	2.99	2.20	8
20	Shimla B-1 (C)	1.70	1.72	2.85	2.09	12
21	VL-7 (C)	**2.97**	**3.09**	**3.60**	3.22	1
	Mean	**1.57**	**1.98**	**2.99**	**2.18**	
	CD (0.05)	**0.30**	**0.09**	**0.21**		
	CV (%) Error	**11.80**	**2.71**	**4.44**		

Table 15. Performance of Chenopodium entries in Initial and Advanced Varietal Trials (IVT & AVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean plant height (cm)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety		
				Mean	Location	Rank	EC-507741	NIC-22503	PRC-9801
	IVT								
1	EC359447	149.33	203.00	10.99	2	8	21.13	9.98	34.31
2	EC507742	110.56	125.20	4.75	2	16	-47.61	-52.44	-41.91
3	IC107299	134.00	204.54	16.22	2	1	78.85	62.38	98.31
4	IC108086	132.89	184.96	11.54	2	7	27.18	15.47	41.01
5	IC341710	126.89	202.82	15.77	2	3	73.85	57.84	92.77
6	IC415477	113.67	162.79	14.14	2	4	55.86	41.51	72.82
7	MCH-1	132.67	263.33	7.25	1	15	-20.07	-27.43	-11.37
8	NIC-15022	138.67	179.77	11.77	2	5	29.79	17.83	43.91
9	NIC-22499	135.44	198.19	8.25	2	12	-9.10	-17.47	0.79
10	NIC-22530	140.11	156.33	3.80	2	18	-58.14	-62.00	-53.59
11	SMLCP-7	137.56	214.86	9.45	2	17	4.21	-5.39	15.55
	AVT-I								
12	SMLCP-1	112.44	133.27	4.41	2	17	-51.34	-55.82	-46.05
13	SMLCP-2	126.89	201.61	16.15	2	2	78.10	61.70	97.47
14	SMLCP-5	132.56	208.88	11.56	2	6	27.45	15.72	41.32
15	SMLCP-6	133.00	231.44	7.70	2	14	-15.14	-22.96	-5.91
16	EC-507741 (C)	110.00	109.72	9.07	1	11	0.00	-9.18	10.92
17	NIC-22503 (C)	145.89	226.39	9.99	2	9	10.14	0.00	22.13
18	PRC-9801 (C)	103.33	143.60	8.18	1	13	-9.85	-18.15	0.00
	Mean	**130.16**	**186.35**	**10.16**					

Table 16. Grain yield (q/ha) in Initial and Advanced Varietal Trials (IVT & AVT) on Chenopodium: 2006 (Hills)

S.No.	Genotypes	Palampur*	Ranichauri	Shimla	Mean	Rank	Location	Frequency
	IVT							
1	EC359447	2.16	***17.59***	4.39	10.99	8	2	1/2
2	EC507742	1.14	6.66	2.84	4.75	16	2	0/2
3	IC107299	1.76	***22.85***	9.59	16.22	1	2	1/2
4	IC108086	0.56	***17.77***	5.30	11.54	7	2	1/2
5	IC341710	1.05	***19.44***	***12.10***	15.77	3	2	2/2
6	IC415477	1.33	13.33	***14.94***	14.14	4	2	1/2
7	MCH-1	-	7.25	-	7.25	15	1	0/1
8	NIC-15022	0.12	11.11	***12.44***	11.77	5	2	1/2
9	NIC-22499	1.54	13.33	3.16	8.25	12	2	0/2
10	NIC-22530	0.99	4.44	3.15	3.80	18	2	0/2
11	SMLCP-7	1.85	12.29	6.61	9.45	17	2	02/
	AVT-I							
12	SMLCP-1	0.80	6.96	1.87	4.41	17	2	0/2
13	SMLCP-2	1.48	***15.70***	***16.61***	16.15	2	2	2/2
14	SMLCP-5	1.85	13.33	***9.79***	11.56	6	2	1/2
15	SMLCP-6	2.28	6.96	8.44	7.70	14	2	0/2
16	EC-507741 (C)	**1.33**	-	**9.07**	9.07	11	1	
17	NIC-22503 (C)	0.09	**11.52**	8.46	9.99	9	2	
18	PRC-9801 (C)	-	8.18	-	8.18	13	1	
	Mean	**1.27**	**12.28**	**8.05**	10.16			
	CD (0.05)	**0.75**	**1.89**	**0.68**				
	CV (%) Error	**35.64**	**9.61**	**5.08**				

*** Data from Palampur not included in the mean due to low yield and high C.V.**

Table 17. Plant height (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Chenopodium: 2006 (Hills)

S.No.	Genotypes	Palampur	Ranichauri	Shimla	Mean	Rank
	IVT					
1	EC359447	***160.67***	193.80	254.53	203.00	7
2	EC507742	97.67	135.70	142.23	125.20	17
3	IC107299	135.67	193.15	284.80	204.54	6
4	IC108086	***165.00***	183.55	206.33	184.96	11
5	IC341710	141.00	192.58	274.87	202.82	8
6	IC415477	119.33	150.68	218.37	162.79	13
7	MCH-1	-	263.33	-	263.33	1
8	NIC-15022	100.33	195.87	243.10	179.77	12
9	NIC-22499	***160.00***	180.00	254.58	198.19	10
10	NIC-22530	80.67	186.93	201.38	156.33	14
11	SMLCP-7	***168.00***	168.20	308.37	214.86	4
	AVT-I					
12	SMLCP-1	109.00	136.47	154.34	133.27	16
13	SMLCP-2	150.67	176.73	277.43	201.61	9
14	SMLCP-5	***161.00***	177.93	287.70	208.88	5
15	SMLCP-6	***174.67***	194.10	325.55	231.44	2
16	EC-507741 (C)	88.67	-	130.77	109.72	18
17	NIC-22503 (C)	**110.33**	**249.40**	**319.43**	226.39	3
18	PRC-9801 (C)	-	143.60	-	143.60	15
	Mean	**132.67**	**183.65**	**242.74**	**186.35**	
	CD (0.05)	**42.42**	**54.25**	**32.85**		
	CV (%) Error	**19.20**	**18.46**	**8.13**		

Table 18. Days to 50% flowering in Initial and Advanced Varietal Trials (IVT & AVT) on Chenopodium: 2006 (Hills)

S.No.	Genotypes	Palampur	Ranichauri	Shimla	Mean	Rank
	IVT					
1	EC359447	70.33	70.00	103.33	81.22	17
2	EC507742	70.00	44.67	71.33	62.00	3
3	IC107299	63.00	60.33	88.67	70.67	9
4	IC108086	61.33	54.67	83.00	66.33	6
5	IC341710	71.33	59.33	83.67	71.44	10
6	IC415477	57.00	50.00	82.33	63.11	4
7	MCH-1	-	66.00	-	66.00	5
8	NIC-15022	71.00	65.00	95.67	77.22	15
9	NIC-22499	71.33	67.00	92.67	77.00	14
10	NIC-22530	72.33	70.00	85.00	75.78	13
11	SMLCP-7	72.00	68.67	95.67	78.78	16
	AVT-I					
12	SMLCP-1	60.67	44.67	80.67	62.00	2
13	SMLCP-2	69.33	49.33	81.00	66.56	7
14	SMLCP-5	68.67	69.00	89.33	75.67	12
15	SMLCP-6	68.00	59.33	94.67	74.00	11
16	EC-507741 (C)	**62.33**	-	**71.67**	67.00	8
17	NIC-22503 (C)	84.33	80.00	105.33	89.89	18
18	PRC-9801 (C)	-	**50.00**	-	50.00	1
	Mean	**68.31**	**60.47**	**87.75**	**72.18**	
	CD (0.05)	**12.50**	**0.99**	**1.28**		
	CV (%) Error	**10.99**	**1.02**	**0.88**		

Table 19. Days to maturity in Initial and Advanced Varietal Trials (IVT & AVT) on Chenopodium: 2006 (Hills)

S.No.	Genotypes	Palampur	Ranichauri	Shimla	Mean	Rank	Location	Frequency
	IVT							
1	EC359447	137.67	137.33	173.00	149.33	18	3	0/3
2	EC507742	120.00	***97.00***	114.67	110.56	3	3	1/3
3	IC107299	122.33	132.33	147.33	134.00	12	3	0/3
4	IC108086	131.00	123.33	144.33	132.89	10	3	0/3
5	IC341710	126.00	107.33	147.33	126.89	6	3	0/3
6	IC415477	123.00	***93.33***	124.67	113.67	5	3	1/3
7	MCH-1	-	132.67	-	132.67	9	1	0/1
8	NIC-15022	130.33	132.33	153.33	138.67	15	3	0/3
9	NIC-22499	131.33	127.67	147.33	135.44	13	3	0/3
10	NIC-22530	142.67	127.33	150.33	140.11	16	3	0/3
11	SMLCP-7	147.33	121.67	143.67	137.56	14	3	0/3
	AVT-I							
12	SMLCP-1	107.00	***93.67***	136.67	112.44	4	3	1/3
13	SMLCP-2	134.33	102.33	144.00	126.89	7	3	0/3
14	SMLCP-5	131.33	122.33	144.00	132.56	8	3	0/3
15	SMLCP-6	134.33	117.33	147.33	133.00	11	3	0/3
16	EC-507741 (C)	**106.67**	-	**113.33**	110.00	2	2	
17	NIC-22503 (C)	141.33	137.33	159.00	145.89	17	3	
18	PRC-9801 (C)	-	**103.33**	-	103.33	1	1	
	Mean	**129.17**	**118.16**	**143.15**	**130.16**			
	CD (0.05)	**18.15**	**1.19**	**1.97**				
	CV (%) Error	**8.44**	**0.63**	**0.82**				

Table 20. Inflorescence length (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Chenopodium: 2006 (Hills)

S.No.	Genotypes	Ranichauri	Shimla	Mean	Rank
	IVT				
1	EC359447	36.75	37.67	37.21	10
2	EC507742	32.53	28.72	30.63	17
3	IC107299	48.22	38.93	43.58	3
4	IC108086	44.90	43.57	44.23	2
5	IC341710	44.67	39.95	42.31	4
6	IC415477	31.37	41.35	36.36	15
7	MCH-1	67.15	-	67.15	1
8	NIC-15022	31.48	41.48	36.48	14
9	NIC-22499	34.42	39.95	37.18	11
10	NIC-22530	38.55	39.43	38.99	8
11	SMLCP-7	31.37	37.73	34.55	16
	AVT-I				
12	SMLCP-1	36.20	46.97	41.58	6
13	SMLCP-2	34.47	47.30	40.88	7
14	SMLCP-5	28.83	45.16	37.00	12
15	SMLCP-6	32.73	41.05	36.89	13
16	EC-507741 (C)	-	24.72	24.72	18
17	NIC-22503 (C)	47.47	37.02	42.24	5
18	PRC-9801 (C)	37.58	-	37.58	9
	Mean	**38.75**	**39.44**	**39.09**	
	CD (0.05)	**12.69**	**7.84**		
	CV (%) Error	**20.46**	**11.94**		

Table 21. Performance of Ricebean entries in Initial and Advanced Varietal Trials (IVT & AVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean weight of 100 seed (g)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety			
				Mean	Location	Rank	PRR-1	PRR-2	RBL-1	RBL-6
	IVT									
1	LRB005	125.33	6.12	9.35	3	5	10.92	-8.06	10.79	22.55
2	LRB009	125.27	6.57	7.47	3	14	-11.34	-26.51	-11.44	-2.04
3	LRB010	125.33	6.73	9.83	3	3	16.66	-3.30	16.53	28.90
4	LRB013	125.00	6.40	9.76	3	4	15.81	-4.00	15.67	27.95
5	LRB022	125.85	6.20	12.04	3	1	42.77	18.34	42.60	57.74
6	LRB023	127.53	7.18	8.96	3	7	6.30	-11.89	6.17	17.45
7	LRB035-1	127.73	6.29	7.32	3	15	-13.12	-27.98	-13.22	-4.01
8	RBL309	125.73	7.04	7.52	3	13	-10.77	-26.04	-10.88	-1.42
9	RBL334	122.39	7.19	8.43	3	10	0.02	-17.09	-0.10	10.50
10	RBL463	128.13	6.77	9.02	3	6	7.02	-11.29	6.89	18.24
11	RBS16	138.22	9.25	3.76	2	16	-55.36	-62.99	-55.41	-50.68
	AVT-I									
12	VRB-1	117.13	6.93	8.52	3	8	1.11	-16.19	0.99	11.71
13	PRR-1 (C)	118.80	6.18	8.43	3	11	0.00	-17.10	-0.11	10.50
14	PRR-2 (C)	116.65	6.56	10.17	3	2	20.69	0.00	20.55	33.35
15	RBL-1 (C)	122.46	6.55	8.44	3	9	0.12	-17.01	0.00	10.62
16	RBL-6 (C)	125.65	6.58	7.63	3	12	-9.51	-24.99	-9.62	0.00
	Mean	124.18	6.70	8.63						

Table 22. Grain yield (q/ha) in Initial and Advanced Varietal Trials (IVT & AVT) on Ricebean: 2006 (Hills)

S.No.	Genotypes	Almora	Bhowali*	Palampur	Ranichauri	Shillong*	Mean	Rank	Location	Frequency
	IVT									
1	LRB005	7.67	10.23	2.33	18.05	9.79	9.35	5	3	0/3
2	LRB009	4.99	17.20	4.66	12.77	6.46	7.47	14	3	0/3
3	LRB010	7.58	12.33	6.40	15.53	13.75	9.83	3	3	0/3
4	LRB013	7.42	9.77	8.15	13.72	8.75	9.76	4	3	0/3
5	LRB022	9.33	13.13	***8.89***	17.88	8.96	12.04	1	3	1/3
6	LRB023	7.28	9.00	6.83	12.77	6.88	8.96	7	3	0/3
7	LRB035-1	8.27	9.43	4.44	9.26	12.29	7.32	15	3	0/3
8	RBL309	7.60	6.80	3.12	11.85	9.17	7.52	13	3	0/3
9	RBL334	5.66	13.80	***8.57***	11.06	16.66	8.43	10	3	1/3
10	RBL463	9.30	9.30	***9.26***	8.51	12.71	9.02	6	3	1/3
11	RBS16	-	-	0.79	6.73	14.38	3.76	16	2	0/2
	AVT-I									
12	VRB-1	8.03	10.63	4.66	12.88	17.29	8.52	8	3	0/3
13	PRR-1 (C)	7.99	10.23	4.05	13.25	**15.21**	8.43	11	3	
14	PRR-2 (C)	7.67	7.07	**7.04**	**15.82**	9.79	10.17	2	3	
15	RBL-1 (C)	**11.59**	13.40	**7.04**	6.69	10.83	8.44	9	3	
16	RBL-6 (C)	7.40	**14.50**	5.56	9.93	9.37	7.63	12	3	
	Mean	**7.85**	**11.12**	**5.75**	**12.29**	**11.39**	**8.63**			
	CD (0.05)	**1.60**	**7.48**	**1.47**	**3.90**	**8.97**				
	CV (%) Error	**12.19**	**42.77**	**15.37**	**19.03**	**47.29**				

*** Data from Bhowali and Shillong not included in the mean due to high C.V.**

Table 23. Plant height (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Ricebean: 2006 (Hills)

S.No.	Genotypes	Almora	Bhowali	Palampur	Ranichauri	Shillong	Mean	Rank
	IVT							
1	LRB005	167.67	108.83	75.33	166.28	105.67	124.76	14
2	LRB009	167.00	118.73	79.67	168.07	99.73	126.64	11
3	LRB010	170.00	105.33	85.33	174.78	109.40	128.97	8
4	LRB013	163.67	89.73	84.67	172.80	130.43	128.26	9
5	LRB022	147.67	116.67	84.33	180.80	95.00	124.89	13
6	LRB023	178.67	141.33	89.67	195.17	114.57	143.88	1
7	LRB035-1	170.67	103.00	77.67	162.80	112.33	125.29	12
8	RBL309	167.00	117.33	84.33	178.15	117.87	132.94	3
9	RBL334	168.00	73.33	92.00	185.93	115.00	126.85	10
10	RBL463	199.00	90.67	87.00	161.93	120.03	131.73	4
11	RBS16	-	-	88.33	182.68	117.33	129.45	7
	AVT-I							
12	VRB-1	181.33	109.67	82.00	168.53	105.77	129.46	6
13	PRR-1 (C)	168.33	90.17	85.33	150.83	104.63	119.86	15
14	PRR-2 (C)	148.33	105.67	**91.00**	133.82	103.97	116.56	16
15	RBL-1 (C)	**169.33**	128.00	79.00	**174.80**	117.43	133.71	2
16	RBL-6 (C)	147.00	**140.67**	81.33	168.30	**117.87**	131.03	5
	Mean	**167.58**	**109.28**	**84.38**	**170.36**	**111.69**	**128.66**	
	CD (0.05)	**29.83**	**33.64**	**8.52**	**25.73**	**24.10**		
	CV (%) Error	**10.63**	**19.70**	**6.07**	**9.07**	**12.96**		

Table 24. Days to 50% flowering in Initial and Advanced Varietal Trials (IVT & AVT) on Ricebean: 2006 (Hills)

S.No.	Genotypes	Almora	Bhowali	Palampur	Ranichauri	Shillong	Mean	Rank
	IVT							
1	LRB005	78.00	56.00	83.67	92.33	54.00	72.80	9
2	LRB009	81.67	55.33	88.67	87.00	59.00	74.33	12
3	LRB010	89.00	55.67	83.67	77.00	56.67	72.40	8
4	LRB013	89.67	56.67	77.00	92.00	57.33	74.53	13
5	LRB022	90.67	54.33	87.67	87.33	58.33	75.67	15
6	LRB023	86.33	60.00	88.00	84.67	58.00	75.40	14
7	LRB035-1	81.00	61.67	87.67	85.00	55.33	74.13	11
8	RBL309	79.00	54.00	86.67	87.67	58.00	73.07	10
9	RBL334	79.67	53.00	80.33	82.00	55.33	70.07	7
10	RBL463	79.33	54.00	83.00	72.33	55.67	68.87	5
11	RBS16	-	-	89.67	92.00	67.33	83.00	16
	AVT-I							
12	VRB-1	73.33	51.00	75.00	72.00	58.00	65.87	1
13	PRR-1 (C)	76.33	**51.00**	79.67	73.67	**54.67**	67.07	3
14	PRR-2 (C)	**74.67**	53.33	**76.00**	**72.00**	**54.67**	66.13	2
15	RBL-1 (C)	79.33	58.00	76.67	**72.00**	57.67	68.73	4
16	RBL-6 (C)	82.33	56.00	79.00	75.00	56.33	69.73	6
	Mean	**81.36**	**55.33**	**82.89**	**81.50**	**57.27**	**71.67**	
	CD (0.05)	**5.83**	**4.26**	**3.71**	**1.41**	**4.04**		
	CV (%) Error	**4.28**	**4.85**	**2.70**	**1.04**	**4.24**		

Table 25. Days to maturity in Initial and Advanced Varietal Trials (IVT & AVT) on Ricebean: 2006 (Hills)

S.No.	Genotypes	Almora	Bhowali	Palampur	Ranichauri	Shillong	Mean	Rank	Location	Frequency
	IVT									
1	LRB005	127.33	104.00	121.00	167.67	106.67	125.33	9	5	0/5
2	LRB009	123.33	103.00	120.33	160.67	119.00	125.27	7	5	0/5
3	LRB010	125.67	106.33	121.00	154.00	119.67	125.33	8	5	0/5
4	LRB013	127.00	104.00	121.67	164.33	108.00	125.00	6	5	0/5
5	LRB022	132.00	98.60	120.67	165.00	113.00	125.85	12	5	0/5
6	LRB023	132.67	104.00	120.67	163.00	117.33	127.53	13	5	0/5
7	LRB035-1	128.00	104.00	121.33	172.00	113.33	127.73	14	5	0/5
8	RBL309	127.00	99.30	122.00	169.67	110.67	125.73	11	5	0/5
9	RBL334	121.67	103.30	121.00	159.67	106.33	122.39	4	5	0/5
10	RBL463	126.67	101.00	120.33	175.00	117.67	128.13	15	5	0/5
11	RBS16	-	-	121.67	169.33	123.67	138.22	16	3	0/3
	AVT-I									
12	VRB-1	109.67	91.30	120.67	157.67	106.33	117.13	2	5	0/5
13	PRR-1 (C)	116.67	**94.00**	122.33	159.67	**101.33**	118.80	3	5	
14	PRR-2 (C)	**115.33**	96.60	120.67	**146.00**	104.67	116.65	1	5	
15	RBL-1 (C)	130.33	100.30	**120.33**	150.00	111.33	122.46	5	5	
16	RBL-6 (C)	126.67	103.60	122.00	158.67	117.33	125.65	10	5	
	Mean	**124.67**	**100.89**	**121.04**	**162.02**	**112.27**	**124.18**			
	CD (0.05)	**6.18**	**7.76**	**1.85**	**9.05**	**18.30**				
	CV (%) Error	**2.96**	**4.84**	**0.92**	**3.35**	**9.79**				

Table 26. 100 seed weight (g) in Initial and Advanced Varietal Trials (IVT & AVT) on Ricebean: 2006 (Hills)

S.No.	Genotypes	Almora	Bhowali	Palampur	Ranichauri	Shillong	Mean	Rank
	IVT							
1	LRB005	4.40	6.20	7.28	7.61	5.11	6.12	16
2	LRB009	4.97	6.50	7.64	8.23	5.49	6.57	9
3	LRB010	5.07	6.73	7.76	8.56	5.53	6.73	7
4	LRB013	4.63	6.73	6.45	8.36	5.82	6.40	12
5	LRB022	4.30	6.80	6.66	7.87	5.38	6.20	14
6	LRB023	5.27	6.80	7.49	9.30	***7.06***	7.18	3
7	LRB035-1	4.77	6.60	6.78	7.85	5.43	6.29	13
8	RBL309	5.07	6.63	7.11	***10.01***	6.37	7.04	4
9	RBL334	4.80	7.20	7.43	***10.15***	6.38	7.19	2
10	RBL463	5.00	7.17	7.17	8.86	5.67	6.77	6
11	RBS16	-	-	7.50	9.11	***11.14***	9.25	1
	AVT-I							
12	VRB-1	4.77	6.90	8.00	***9.44***	5.56	6.93	5
13	PRR-1 (C)	4.57	6.03	6.56	8.65	5.11	6.18	15
14	PRR-2 (C)	**4.97**	**6.60**	7.20	8.31	5.71	6.56	10
15	RBL-1 (C)	4.50	6.17	**7.21**	**8.97**	**5.92**	6.55	11
16	RBL-6 (C)	4.73	6.40	7.17	8.95	5.63	6.58	8
	Mean	**4.79**	**6.63**	**7.22**	**8.76**	**6.08**	**6.70**	
	CD (0.05)	**0.46**	**0.67**	**0.96**	**0.03**	**0.95**		
	CV (%) Error	**5.75**	**6.42**	**7.99**	**0.24**	**9.42**		

Table 27. Performance of Adzuki bean entries in Initial and Advanced Varietal Trials (IVT & AVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean weight of 100 seed (g)	Mean grain yield over locations (q/ha)			Percent increase/ decrease over qualifying variety
				Mean	Location	Rank	
	IVT						
1	EC000254	101.67	9.65	9.75	3	9	-21.15
2	EC008707	104.00	12.05	9.19	3	12	-25.63
3	EC015257	117.89	8.52	9.92	3	7	-19.73
4	EC030253	107.22	9.74	8.11	3	18	-34.40
5	EC030256	108.11	10.21	7.47	3	20	-39.55
6	EC030270	107.00	7.47	8.18	3	16	-33.82
7	EC340247	109.67	12.31	5.05	3	22	-59.18
8	EC340264	106.22	9.52	9.47	3	11	-23.42
9	EC340271	110.78	12.93	7.92	3	19	-35.95
10	EC340284	110.11	11.06	8.90	3	14	-28.01
11	EC341955	107.89	9.63	9.88	3	8	-20.09
12	IC241041	108.67	9.87	8.95	3	13	-27.62
13	IC340263	102.56	9.94	8.15	3	17	-34.04
14	SMLAB-1	104.44	11.37	9.71	3	10	-21.43
15	SMLAB-8	109.89	10.44	8.59	3	15	-30.47
	AVT-I						-100.00
16	EC340255	107.89	11.81	6.50	3	21	-47.40
	AVT-II						-100.00
17	HPAB-30	108.67	10.24	10.50	3	6	-15.01
18	SMLAB-4	106.78	10.71	11.41	3	3	-7.70
19	SMLAB-6	110.67	9.92	10.60	3	5	-14.21
20	SMLAB-9	110.22	10.71	10.81	3	4	-12.58
21	SMLAB-10	109.67	10.01	11.91	3	2	-3.61
22	HPU51 (C)	104.00	10.83	12.36	3	1	0.00
	Mean	**107.91**	**10.41**	**9.24**			

Table 28. Grain yield (q/ha)in Initial and Advanced Varietal Trials (IVT & AVT) on Adzuki bean: 2006 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank	Location	Frequency
	IVT							
1	EC000254	3.33	13.41	12.49	9.75	9	3	0/3
2	EC008707	3.33	12.96	11.29	9.19	12	3	0/3
3	EC015257	3.37	10.52	***15.87***	9.92	7	3	1/3
4	EC030253	2.65	10.29	11.38	8.11	18	3	0/3
5	EC030256	5.03	8.59	8.79	7.47	20	3	0/3
6	EC030270	3.92	7.20	13.42	8.18	16	3	0/3
7	EC340247	3.01	4.26	7.87	5.05	22	3	0/3
8	EC340264	4.05	13.70	10.65	9.47	11	3	0/3
9	EC340271	3.19	13.15	7.40	7.92	19	3	0/3
10	EC340284	2.50	12.72	11.48	8.90	14	3	0/3
11	EC341955	3.74	12.47	13.42	9.88	8	3	0/3
12	IC241041	5.33	10.96	10.55	8.95	13	3	0/3
13	IC340263	5.55	11.97	6.94	8.15	17	3	0/3
14	SMLAB-1	4.97	13.06	11.11	9.71	10	3	0/3
15	SMLAB-8	3.68	10.72	11.38	8.59	15	3	0/3
	AVT-I							
16	EC340255	5.97	7.52	6.01	6.50	21	3	0/3
	AVT-II							
17	HPAB-30	4.03	14.99	12.49	10.50	6	3	0/3
18	SMLAB-4	***6.25***	14.56	13.42	11.41	3	3	1/3
19	SMLAB-6	4.28	15.77	11.75	10.60	5	3	0/3
20	SMLAB-9	***7.24***	11.29	13.88	10.81	4	3	1/3
21	SMLAB-10	5.41	16.91	13.42	11.91	2	3	0/3
22	HPU51 (C)	5.40	17.79	13.88	12.36	1	3	
	Mean	4.37	**12.04**	**11.31**	**9.24**			
	CD (0.05)	0.61	**1.16**	**1.88**				
	CV (%) error	**8.78**	**6.03**	**10.37**				

Table 29. Plant height (cm) in Initial and Advanced Varietal Trials (IVT & AVT) on Adzuki bean: 2006 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank
	IVT					
1	EC000254	42.67	***73.43***	45.23	53.78	5
2	EC008707	46.33	65.67	***54.98***	55.66	3
3	EC015257	50.33	***72.87***	42.42	55.21	4
4	EC030253	51.33	60.43	36.83	49.53	17
5	EC030256	45.67	60.30	31.80	45.92	21
6	EC030270	45.33	47.67	43.27	45.42	22
7	EC340247	41.00	***66.97***	44.13	50.70	15
8	EC340264	48.67	***74.43***	33.13	52.08	13
9	EC340271	45.00	56.67	38.17	46.61	20
10	EC340284	46.00	66.97	43.47	52.14	12
11	EC341955	42.67	63.33	37.00	47.67	18
12	IC241041	51.67	64.10	41.47	52.41	9
13	IC340263	47.00	***72.23***	37.60	52.28	11
14	SMLAB-1	61.00	***76.97***	***48.27***	62.08	1
15	SMLAB-8	51.33	62.53	44.67	52.84	8
	AVT-I					
16	EC340255	50.67	68.30	32.47	50.48	16
	AVT-II					
17	HPAB-30	45.00	63.10	33.35	47.15	19
18	SMLAB-4	51.67	***74.00***	41.47	55.71	2
19	SMLAB-6	44.33	***69.87***	40.47	51.56	14
20	SMLAB-9	51.00	64.87	43.33	53.07	7
21	SMLAB-10	49.00	66.43	41.60	52.34	10
22	HPU51 (C)	58.00	56.83	45.02	53.28	6
	Mean	**48.44**	**65.82**	**40.92**	**51.72**	
	CD (0.05)	**5.68**	**11.48**	**0.83**		
	CV (%) error	**7.32**	**10.90**	**1.26**		

Table 30. Days to 50% flowering in Initial and Advanced Varietal Trials (IVT & AVT) on Adzuki bean: 2006 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank
	IVT					
1	EC000254	44.33	49.67	66.33	53.44	2
2	EC008707	43.67	66.00	72.00	60.56	16
3	EC015257	47.00	58.33	54.33	53.22	1
4	EC030253	47.67	59.00	72.00	59.56	13
5	EC030256	50.67	62.67	71.33	61.56	19
6	EC030270	50.67	52.33	65.00	56.00	8
7	EC340247	48.00	64.00	66.67	59.56	14
8	EC340264	51.00	56.67	60.00	55.89	7
9	EC340271	53.00	60.33	72.00	61.78	21
10	EC340284	47.33	51.00	66.67	55.00	3
11	EC341955	48.00	64.67	72.33	61.67	20
12	IC241041	48.67	61.00	67.67	59.11	12
13	IC340263	48.33	50.33	68.33	55.67	5
14	SMLAB-1	49.33	60.00	66.00	58.44	10
15	SMLAB-8	50.67	60.33	72.33	61.11	17
	AVT-I					
16	EC340255	51.00	60.00	62.00	57.67	9
	AVT-II					
17	HPAB-30	48.33	58.00	70.00	58.78	11
18	SMLAB-4	48.00	55.67	63.00	55.56	4
19	SMLAB-6	49.67	65.33	72.67	62.56	22
20	SMLAB-9	49.67	64.00	66.33	60.00	15
21	SMLAB-10	54.33	57.00	72.00	61.11	18
22	HPU51 (C)	43.00	55.33	69.00	55.78	6
	Mean	**48.74**	**58.71**	**67.64**	**58.36**	
	CD (0.05)	**5.43**	**2.99**	**1.05**		
	CV (%) error	**6.97**	**3.18**	**0.97**		

Table 31. Days to maturity in Initial and Advanced Varietal Trials (IVT & AVT) on Adzuki bean: 2006 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank	Location	Frequency
	IVT							
1	EC000254	85.33	116.67	103.00	101.67	1	3	0/3
2	EC008707	***83.67***	120.33	108.00	104.00	3	3	1/3
3	EC015257	88.00	143.67	122.00	117.89	22	3	0/3
4	EC030253	84.33	119.33	118.00	107.22	9	3	0/3
5	EC030256	88.00	123.33	113.00	108.11	12	3	0/3
6	EC030270	85.67	119.33	116.00	107.00	8	3	0/3
7	EC340247	88.67	122.33	118.00	109.67	15	3	0/3
8	EC340264	86.00	120.67	112.00	106.22	6	3	0/3
9	EC340271	89.33	120.00	123.00	110.78	21	3	0/3
10	EC340284	86.67	119.33	124.33	110.11	18	3	0/3
11	EC341955	85.33	120.00	118.33	107.89	10	3	0/3
12	IC241041	86.67	121.33	118.00	108.67	13	3	0/3
13	IC340263	84.33	120.00	103.33	102.56	2	3	0/3
14	SMLAB-1	87.67	120.67	105.00	104.44	5	3	0/3
15	SMLAB-8	85.67	119.67	124.33	109.89	17	3	0/3
	AVT-I							
16	EC340255	87.00	123.00	113.67	107.89	11	3	0/3
	AVT-II							
17	HPAB-30	85.67	120.33	120.00	108.67	14	3	0/3
18	SMLAB-4	83.33	122.33	114.67	106.78	7	3	0/3
19	SMLAB-6	87.33	121.00	123.67	110.67	20	3	0/3
20	SMLAB-9	87.00	121.67	122.00	110.22	19	3	0/3
21	SMLAB-10	84.33	119.67	125.00	109.67	16	3	0/3
22	HPU51 (C)	86.67	117.33	108.00	104.00	4	3	
	Mean	**86.21**	**121.45**	**116.06**	**107.91**			
	CD (0.05)	**2.66**	**2.89**	**0.83**				
	CV (%) error	**1.93**	**1.49**	**0.44**				

Table 32. 100 seed weight (g) in Initial and Advanced Varietal Trials (IVT & AVT) on Adzuki bean: 2006 (Hills)

S.No.	Genotypes	Palampur	Shimla	Ranichauri	Mean	Rank
	IVT					
1	EC000254	7.63	9.44	11.88	9.65	18
2	EC008707	8.90	12.12	***15.13***	12.05	3
3	EC015257	7.10	7.21	11.24	8.52	21
4	EC030253	8.17	8.87	12.19	9.74	17
5	EC030256	10.01	9.31	11.30	10.21	12
6	EC030270	6.72	7.15	8.53	7.47	22
7	EC340247	9.64	9.50	***17.78***	12.31	2
8	EC340264	7.61	10.56	10.41	9.52	20
9	EC340271	***12.35***	***14.57***	11.87	12.93	1
10	EC340284	10.36	11.05	11.79	11.06	6
11	EC341955	7.65	10.48	10.75	9.63	19
12	IC241041	7.64	9.64	***12.31***	9.87	16
13	IC340263	7.71	9.97	12.14	9.94	14
14	SMLAB-1	9.11	11.69	***13.32***	11.37	5
15	SMLAB-8	8.18	10.35	***12.81***	10.44	10
	AVT-I					
16	EC340255	8.05	8.48	***18.90***	11.81	4
	AVT-II					
17	HPAB-30	8.37	9.53	***12.83***	10.24	11
18	SMLAB-4	8.71	10.82	***12.58***	10.71	9
19	SMLAB-6	8.80	9.53	11.43	9.92	15
20	SMLAB-9	9.16	9.64	***13.34***	10.71	8
21	SMLAB-10	8.38	9.56	12.10	10.01	13
22	HPU51 (C)	8.82	11.49	12.17	10.83	7
	Mean	**8.59**	**10.04**	**12.58**	**10.41**	
	CD (0.05)	**1.72**	**0.78**	**0.02**		
	CV (%) error	**12.49**	**4.84**	**0.12**		

Table 33. Performance of Faba bean entries in Initial Varietal Trial (IVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean weight of 100 seed (g)	Mean yield over locations (q/ha)				Percent increase/decrease over qualifying variety			
								Seed yield		Pod yield	
				Mean pod yield	Mean seed yield	Location	Rank	Vikrant	Local	Vikrant	Local
	IVT										
1	HB 603	164.00	32.53	2.00	1.01	1	3	42.25	-0.98	-11.11	-25.93
2	HB 604	161.50	30.07	2.20	0.95	1	6	33.10	-7.35	-2.22	-18.52
3	HB 608	163.00	29.36	2.20	0.98	1	4	37.32	-4.41	-2.22	-18.52
4	HB 611	161.50	30.18	2.45	1.14	1	1	60.56	11.76	8.89	-9.26
5	HB 613	158.75	30.21	2.33	0.97	1	5	36.62	-4.90	3.33	-13.89
6	ISVIO-2	160.00	27.34	1.38	0.46	1	8	-35.21	-54.90	-38.89	-49.07
7	Vikrant (C)	162.50	31.46	2.25	0.71	1	7	0.00	-30.88	0.00	-16.67
8	Local (C)	160.75	34.92	2.70	1.02	1	2	42.96	0.00	20.00	0.00
	Mean	**161.50**	**30.76**	**2.19**	**0.90**						

Table 34. Different characters of Faba bean entries in Initial Varietal Trial (IVT) during 2006 at Palampur (Hills)

S.No.	Genotype	Days to75% flowering	Days to maturity	Plant height (cm)	Number of primary branches	Pod length (cm)	100 seed weight (g)	Pod yield (q/ha)	Seed yield (q/ha)	Rank
	IVT									
1	HB 603	106.75	164.00	47.25	3.50	4.38	32.53	2.00	1.01	3
2	HB 604	106.00	161.50	50.70	4.10	4.80	30.07	2.20	0.95	6
3	HB 608	107.00	163.00	52.15	4.25	5.05	29.36	2.20	0.98	4
4	HB 611	108.75	161.50	53.70	4.98	5.25	30.18	2.45	1.14	1
5	HB 613	106.25	158.75	54.03	4.75	4.86	30.21	2.33	0.97	5
6	ISVIO-2	103.75	160.00	37.60	3.05	4.67	27.34	1.38	0.46	8
7	Vikrant (C)	109.25	162.50	50.85	3.73	4.55	31.46	2.25	0.71	7
8	Local (C)	109.25	160.75	41.88	4.85	4.82	34.92	2.70	1.02	2
	Mean	**107.13**	**161.50**	**48.52**	**4.15**	**4.80**	**30.76**	**2.19**	**0.90**	
	CD (0.05)	**2.31**	**1.51**	**6.38**	**0.62**					
	CV (%) Error	**1.47**	**0.63**	**8.94**	**10.21**					

Table 35. Performance of Job's tear entries in Initial Varietal Trial (IVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean seed weight (g/100 seed)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety	
				Mean	Location	Rank	Mayeon	Pollin
	IVT							
1	AAH-33	173.33	7.24	6.25	2	1	88.19	15.28
2	BDS1868	185.67	5.11	3.62	2	19	8.92	-33.28
3	DKH-07	177.67	6.81	5.15	2	5	55.22	-4.92
4	H0300	185.17	4.61	4.43	2	12	33.45	-18.26
5	H0303	177.33	8.22	5.65	2	2	70.19	4.25
6	H0305	178.58	5.45	4.10	2	14	23.48	-24.36
7	H0306	178.58	5.51	4.13	2	13	24.54	-23.71
8	H0547	175.00	7.70	3.74	2	18	12.70	-30.97
9	H0626	178.28	7.64	5.15	2	6	55.10	-4.99
10	H0732	178.94	8.22	4.69	2	10	41.40	-13.38
11	H2215	173.72	7.56	4.75	2	9	43.20	-12.28
12	H2279	175.22	7.30	4.98	2	7	50.13	-8.04
13	H2287	173.39	7.58	5.28	2	4	59.12	-2.53
14	H3768	171.00	7.23	3.88	2	17	16.73	-28.50
15	HM 2902	173.28	8.17	4.80	2	8	44.69	-11.37
16	HM 3026	172.50	5.71	3.93	2	16	18.39	-27.48
17	HRLT 1560	175.11	6.54	4.55	2	11	37.17	-15.97
18	NH-6/22	174.17	7.23	3.95	2	15	19.00	-27.11
19	Mayeon (C)	172.44	8.19	3.32	2	20	0.00	-38.66
20	Pollin (C)	171.67	7.24	5.42	2	3	63.37	0.00
	Mean	**175.13**	**7.55**	**4.59**				

Table 36. Seed yield (q/ha) in Initial Varietal Trial (IVT) on Job's tear: 2006 (Hills)

S.No.	Genotypes	Palampur	Shillong*	Ranichauri	Mean	Rank	Location	Frequency
	IVT							
1	AAH-33	7.61	8.75	***4.89***	6.25	1	2	1/2
2	BDS1868	4.76	-	2.48	3.62	19	2	0/2
3	DKH-07	6.18	10.31	4.13	5.15	5	2	0/2
4	H0300	5.58	-	3.29	4.43	12	2	0/2
5	H0303	6.09	17.49	***5.21***	5.65	2	2	1/2
6	H0305	4.91	-	3.29	4.10	14	2	0/2
7	H0306	4.94	-	3.33	4.13	13	2	0/2
8	H0547	4.82	6.88	2.67	3.74	18	2	0/2
9	H0626	6.39	14.38	3.91	5.15	6	2	0/2
10	H0732	6.42	14.06	2.97	4.69	10	2	0/2
11	H2215	5.33	10.31	4.18	4.75	9	2	0/2
12	H2279	5.88	17.19	4.09	4.98	7	2	0/2
13	H2287	4.58	17.19	***5.99***	5.28	4	2	1/2
14	H3768	4.58	11.56	3.18	3.88	17	2	0/2
15	HM 2902	5.76	6.25	3.85	4.80	8	2	0/2
16	HM 3026	4.12	-	3.74	3.93	16	2	0/2
17	HRLT 1560	4.33	7.19	***4.78***	4.55	11	2	1/2
18	NH-6/22	5.15	6.56	2.75	3.95	15	2	0/2
19	Mayeon (C)	3.91	**20.63**	2.74	3.32	20	2	
20	Pollin (C)	**6.79**	9.69	**4.06**	5.42	3	2	
	Mean	**5.41**	**11.89**	**3.77**	**4.59**			
	CD (0.05)	**2.24**	**13.31**	**0.54**				
	CV (%) Error	**25.92**	**52.06**	**6.80**				

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

Table 37. Fresh and Dry Fodder yield (q/ha) in Initial Varietal Trial (IVT) on Job's tear at Ranichauri - 2006 (Hills)

S.No.	Genotypes	Fresh fodder yield (q/ha)	Dry fodder yield (q/ha)	Rank
	IVT			
1	AAH-33	468.05	176.39	5
2	BDS1868	405.50	123.17	14
3	DKH-07	400.00	127.00	12
4	H0300	334.72	100.28	16
5	H0303	504.16	198.44	3
6	H0305	313.89	86.28	18
7	H0306	326.39	85.83	19
8	H0547	220.83	48.61	20
9	H0626	444.44	141.33	11
10	H0732	451.39	149.72	10
11	H2215	387.78	126.50	13
12	H2279	486.67	176.00	6
13	H2287	***633.89***	202.39	2
14	H3768	***631.94***	209.22	1
15	HM 2902	477.77	157.44	8
16	HM 3026	454.17	155.83	9
17	HRLT 1560	501.39	160.50	7
18	NH-6/22	315.28	87.94	17
19	Mayeon (C)	412.50	122.50	15
20	Pollin (C)	**548.05**	**185.44**	4
	Mean	**435.94**	**141.04**	
	CD (0.05)	**30.64**	**26.08**	
	CV (%) Error	**3.36**	**8.85**	

Table 38. Plant height (cm) in Initial Varietal Trial (IVT) on Job's tear: 2006 (Hills)

S.No.	Genotypes	Palampur	Shillong	Ranichauri	Mean	Rank
	IVT					
1	AAH-33	225.00	437.50	212.70	291.73	2
2	BDS1868	208.33	-	192.00	200.17	19
3	DKH-07	214.33	413.35	212.50	280.06	10
4	H0300	213.33	-	202.73	208.03	17
5	H0303	215.33	418.50	229.35	287.73	6
6	H0305	211.33	-	193.00	202.17	18
7	H0306	200.67	-	193.80	197.23	20
8	H0547	189.33	414.20	206.10	269.88	14
9	H0626	225.67	434.15	213.13	290.98	3
10	H0732	226.33	385.85	208.70	273.63	13
11	H2215	207.00	453.40	212.13	290.84	4
12	H2279	206.33	412.40	173.80	264.18	15
13	H2287	211.67	417.50	218.90	282.69	9
14	H3768	192.67	417.25	216.30	275.41	11
15	HM 2902	202.33	438.10	214.50	284.98	8
16	HM 3026	208.00	-	211.93	209.96	16
17	HRLT 1560	227.67	431.70	210.80	290.06	5
18	NH-6/22	198.00	443.35	219.05	286.80	7
19	Mayeon (C)	212.33	**440.85**	**228.30**	293.83	1
20	Pollin (C)	**224.33**	392.50	206.90	274.58	12
	Mean	**211.00**	**423.37**	**208.83**	**281.07**	
	CD (0.05)	**32.47**	**68.61**	**37.43**		
	CV (%) Error	**9.62**	**7.54**	**8.58**		

Table 39. Days to 50% flowering in Initial Varietal Trial (IVT) on Job's tear: 2006 (Hills)

S.No.	Genotypes	Palampur	Shillong	Ranichauri	Mean	Rank
	IVT					
1	AAH-33	132.33	108.00	105.00	115.11	11
2	BDS1868	127.33	-	115.00	121.17	19
3	DKH-07	126.00	105.00	107.00	112.67	7
4	H0300	126.33	-	115.00	120.67	18
5	H0303	119.00	100.00	115.00	111.33	2
6	H0305	129.00	-	113.50	121.25	20
7	H0306	124.00	-	112.00	118.00	16
8	H0547	132.33	116.50	110.00	119.61	17
9	H0626	122.00	117.00	113.00	117.33	15
10	H0732	133.00	112.00	105.50	116.83	14
11	H2215	130.67	111.50	106.00	116.06	13
12	H2279	120.67	106.50	110.50	112.56	5
13	H2287	119.67	110.00	***100.00***	109.89	1
14	H3768	122.00	112.50	106.50	113.67	9
15	HM 2902	124.33	111.00	108.00	114.44	10
16	HM 3026	128.00	-	***99.00***	113.50	8
17	HRLT 1560	128.33	104.00	105.50	112.61	6
18	NH-6/22	122.00	111.50	104.00	112.50	4
19	Mayeon (C)	**126.00**	114.50	107.00	115.83	12
20	Pollin (C)	128.33	**103.50**	**105.00**	112.28	3
	Mean	**126.07**	**109.57**	**108.13**	**114.59**	
	CD (0.05)	**7.50**	**6.08**	**1.26**		
	CV (%) Error	**3.72**	**2.58**	**0.56**		

Table 40. Days to maturity in Initial Varietal Trial (IVT) on Job's tear: 2006 (Hills)

S.No.	Genotypes	Palampur	Shillong	Ranichauri	Mean	Rank	Location	Frequency
	IVT							
1	AAH-33	173.00	171.00	176.00	173.33	6	3	0/3
2	BDS1868	185.33	-	186.00	185.67	20	2	0/2
3	DKH-07	184.00	171.00	178.00	177.67	14	3	0/3
4	H0300	185.33	-	185.00	185.17	19	2	0/2
5	H0303	175.00	170.50	186.50	177.33	13	3	0/3
6	H0305	173.67	-	183.50	178.58	16	2	0/2
7	H0306	174.67	-	182.50	178.58	17	2	0/2
8	H0547	173.00	171.00	181.00	175.00	10	3	0/3
9	H0626	179.33	172.00	183.50	178.28	15	3	0/3
10	H0732	179.33	171.00	186.50	178.94	18	3	0/3
11	H2215	173.67	171.00	176.50	173.72	8	3	0/3
12	H2279	173.67	171.00	181.00	175.22	12	3	0/3
13	H2287	174.67	174.50	171.00	173.39	7	3	0/3
14	H3768	173.00	165.00	175.00	171.00	1	3	0/3
15	HM 2902	***172.33***	169.50	178.00	173.28	5	3	1/3
16	HM 3026	174.00	-	171.00	172.50	4	2	0/2
17	HRLT 1560	179.33	165.00	181.00	175.11	11	3	0/3
18	NH-6/22	174.00	165.50	183.00	174.17	9	3	0/3
19	Mayeon (C)	178.33	**161.50**	177.50	172.44	3	3	
20	Pollin (C)	**174.00**	165.00	**176.00**	171.67	2	3	
	Mean	**176.48**	**168.97**	**179.93**	**175.13**			
	CD (0.05)	**1.67**	**11.68**	**1.35**				
	CV (%) Error	**0.59**	**3.21**	**0.36**				

Table 41. Seed weight (g/100 seed) in Initial Varietal Trial (IVT) on Job's tear: 2006 (Hills)

S.No.	Genotypes	Shillong	Ranichauri	Mean	Rank
	IVT				
1	AAH-33	9.08	***5.41***	7.24	10
2	BDS1868	-	5.11	5.11	19
3	DKH-07	8.74	4.89	6.81	14
4	H0300	-	4.61	4.61	20
5	H0303	11.54	4.91	8.22	2
6	H0305	-	***5.45***	5.45	18
7	H0306	-	***5.51***	5.51	17
8	H0547	9.30	***6.10***	7.70	5
9	H0626	9.86	***5.42***	7.64	6
10	H0732	11.78	4.67	8.22	1
11	H2215	9.94	5.17	7.56	8
12	H2279	9.48	5.11	7.30	9
13	H2287	10.17	5.00	7.58	7
14	H3768	9.34	5.12	7.23	13
15	HM 2902	11.33	5.01	8.17	4
16	HM 3026	-	5.71	5.71	16
17	HRLT 1560	8.44	4.63	6.54	15
18	NH-6/22	9.36	5.11	7.23	12
19	Mayeon (C)	**11.41**	**4.97**	8.19	3
20	Pollin (C)	9.58	4.91	7.24	11
	Mean	**9.95**	**5.14**	**7.55**	
	CD (0.05)	**4.12**	**0.33**		
	CV (%) Error	**19.25**	**3.06**		

Table 42. Performance of Perilla entries in Initial Varietal Trial (IVT) during 2006 (Hills)

S. No.	Genotypes	Mean maturity duration (days)	Mean weight of seed (g/10ml)	Mean grain yield over locations (q/ha)			Percent increase/ decrease over qualifying variety
				Mean	Location	Rank	
	IVT						
1	BDS-1644	199.00	1.62	15.26	1	1	-98.54
2	BDS-1647	198.00	1.59	12.42	1	2	-98.82
3	BDS-1649	212.00	1.72	4.71	1	13	-99.55
4	GP-178	213.50	1.68	7.32	1	10	-99.30
5	H0556	209.00	1.49	4.50	1	14	-99.57
6	H0664	198.00	1.25	5.31	1	12	-99.49
7	H1099	199.00	1.44	8.29	1	9	-99.21
8	H1143	200.50	1.36	10.10	1	4	-99.04
9	H1756	212.00	1.44	9.98	1	6	-99.05
10	H1796	211.50	1.47	6.65	1	11	-99.37
11	H1812	199.00	1.52	9.48	1	7	-99.10
12	H1812	199.00	1.52	9.48	1	8	-99.10
13	H3944	196.50	1.82	10.06	1	5	-99.04
14	RD029	201.00	0.68	3.73	1	15	-99.64
15	BDS-1650 (C)	208.50	1.55	10.48	1	3	-99.00
	Mean	**203.77**	**1.47**	**8.52**			

Table 43. Different characters of Perilla entries in Initial Varietal Trial (IVT) during 2006 at Shillong (Hills)

S.No.	Genotypes	Days to 50% flowering	Days to maturity	Plant height (cm)	Inflorescence length (cm)	Seed weight (g/10 ml)	Number of primary branches	Grain yield (q/ha)	Rank
	IVT								
1	BDS-1644	156.00	199.00	171.50	7.27	1.62	18.34	15.26	1
2	BDS-1647	152.00	198.00	191.34	8.82	1.59	24.34	12.42	2
3	BDS-1649	168.50	212.00	220.00	9.17	1.72	24.00	4.71	13
4	GP-178	164.00	213.50	165.34	7.09	1.68	22.50	7.32	10
5	H0556	160.00	209.00	184.50	7.00	1.49	23.67	4.50	14
6	H0664	152.00	198.00	170.00	8.17	1.25	21.84	5.31	12
7	H1099	159.00	199.00	179.00	8.25	1.44	26.17	8.29	9
8	H1143	162.00	200.50	181.17	6.08	1.36	23.67	10.10	4
9	H1756	159.00	212.00	168.50	6.42	1.44	25.50	9.98	6
10	H1796	157.00	211.50	144.67	6.48	1.47	20.67	6.65	11
11	H1812	156.00	199.00	194.84	8.00	1.52	25.67	9.48	7
12	H1812	156.00	199.00	194.84	8.00	1.52	25.67	9.48	8
13	H3944	148.00	196.50	158.34	8.00	1.82	23.84	10.06	5
14	RD029	158.50	201.00	167.50	7.37	0.68	22.00	3.73	15
15	BDS-1650 (C)	159.00	208.50	198.67	7.17	1.55	22.00	10.48	3
	Mean	**157.80**	**203.77**	**179.35**	**7.55**	**1.47**	**23.32**	**8.52**	
	CD (0.05)	**9.71**	**6.66**	**42.65**	**2.27**	**0.49**	**4.07**	**6.82**	
	CV (%) Error	**2.86**	**1.52**	**11.06**	**13.98**	**15.45**	**8.12**	**37.22**	

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 2006 season. However, in some crops such as grain amaranth and faba bean, experiments were conducted during the rabi 2005-2006 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 2005-06 and kharif 2006.

2.2.1.1 Initial Varietal Trial: Rabi 2005-06

The trial comprising 12 entries including four checks was conducted at six locations. Data have been received from all the centres. The summary of performance of the entries has been presented in table 44.

Significant differences were observed among the entries for grain yield at all the centres. Seed yield levels were high at Faizabad (19.07 q/ha) followed by S.K. Nagar (18.97 q/ha) and Mandor (18.54 q/ha) (Table 45). However, it was low at most of the other centres. The overall average showed that among IVT entries, SKNA 503 (13.89 q/ha) was the highest yielder.

Plant height was the highest at S.K. Nagar (137.79 cm) and the lowest at Ranchi (60.67 cm) centre (Table 46). On the basis of average over the locations GA 1 (131.77 cm) had the highest plant height whereas Annapurna had the lowest height (74.85 cm).

Flowering time was the earliest at Mandor (46.79 days) followed by at Bhubaneswar (49.30 days) and Faizabad (52.10 days); while it was moderately late at Ranchi and Ambikapur centres (Table 47). On the basis of average over locations Annapurna was the earliest flowering (49.08 days) entry.

Maturity period was the earliest at Bhubaneswar (93.08 days) followed by Faizabad (104.10 days) (Table 48). Annapurna (100.75 days) and SKNA 501 (113.78 days) were the earliest maturing lines.

Test weight (Table 49) as measured by the weight of 10 ml seed showed maximum mean value at Mandor (8.04 g) and minimum at S.K. Nagar (4.80 g). Based on the average over four locations Annapurna had the highest seed weight (7.12 g).

Inflorescence length of the entries showed significant difference at S.K. Nagar and Faizabad (Table 50). Based on the average over the locations GA 1 (65.86 cm) had the longest inflorescence.

2.1.1.2 Initial Varietal Trial (IVT) : Kharif - 2006

In this trial 9 entries, including four checks, were proposed to be tested at three locations but the experiment failed at Rahuri centre. The performance of the entries as compared to the checks has been summarized in table 51. No entry showed yield superiority over the best check variety, GA-1.

Significant differences were observed among the entries for seed yield at both the locations (Table 52). Mean seed yield level was moderate at Mettupalayam (5.09 q/ha) and very low at Bangalore centre and hence not included in the average. SKNA 601 (8.13 q/ha) was the highest yielding entry at Mettupalayam.

Average plant height of the entries was the highest at Mettupalayam (192.32 cm) but low at Bangalore (46.78 cm) centre (Table 53). Based on single location data GA 2had the highest plant height (232.73 cm).

Flowering time showed little variation among the locations. The mean flowering time was the similar (50.78 days) both at Bangalore and at Mettupalayam (Table 54). The check variety Annapurna showed early flowering consistently at both the locations.

Maturity period also showed similar trend as that of flowering time. The average maturity period of the entries over two locations was 88.91 days (Table

55). The earliest flowering entry, Annapurna was earliest in maturity also (80.13 days). The average maturity period was higher at Bangalore (92.04 days) while, it was slightly lower at Mettupalayam (85.78 days).

Test weight (Table 56) expressed in terms of weight of 10 ml seed recorded at two centres showed that it was higher at Mettupalayam (8.10 g) followed by Bangalore (7.31 g) cnetre. Based on single location data the entry, GA 2 (8.23 g) showed the highest test weight.

2.1.2.1 Advanced Varietal Trial (AVT) : Kharif - 2006

The trial comprising 11 entries including four checks was proposed to be conducted at three locations. Data have been received from two centres only. The summary of performance of the entries has been presented in table 57.

Significant differences were observed among the entries for grain yield at all the centres. Seed yield levels were low at Bangalore (1.13 q/ha) hence not included in the average (Table 58). Among AVT-I and AVT-II entries, Suvarna (8.29 q/ha) was the highest yielder followed by Annapurna (6.03 q/ha).

Plant height was the highest at Mettupalayam (198.95 cm) and lowest at Bangalore (76.69 cm) centre (Table 59). On the basis of average over the locations RMA 3 (159.08 cm) had the highest plant height whereas Annapurna had the lowest height (108.78 cm).

Flowering time was almost similar at both the centres viz. 49.95 days at Bangalore and 51.12 days at Mettupalayam.

Maturity period was the earliest at Mettupalayam (86.36 days) followed by Bangalore (93.61 days) centre (Table 61). Annapurna (77.67 days) was the earliest maturing line.

Test weight (Table 62) as measured by the weight of 10 ml seed showed maximum mean value at Mettupalayam (8.32 g) and minimum at Bangalore (5.44 g). Based on the average over two locations SKNA 501 had the highest seed weight (7.08 g).

2.2.2 RICE BEAN (*Vigna umbellata*)

2.2.2.1 Initial Varietal Trial

The Initial Varietal Trial along with four checks was conducted at 10 locations in the plains. Data have been received from all the locations. Summary performance of these entries has been indicated in table 63.

The average seed yield ranged from 0.70 q/ha at Bangalore to 15.54 q/ha at Ludhiana (Table 64). Data from Bangalore and S.K. Nagar centres have not been included due to high C.V. and low yield. Significant differences were observed among the entries for seed yield at all the locations. On the basis of average performance over eight locations the entry LRB 334 (10.18 q/ha) was the highest yielder.

Plant height showed extreme variation ranging from 40.43 cm at Bangalore to 131.86 cm at Hisar centres (Table 65). Based on the average performance over the locations the entry LRB 107 had the maximum plant height (98.90 cm).

The flowering time was the earliest at Bangalore (45.26 days) which was closely followed by Mettupalayam (48.18 days), while it was the longest at Hisar (84.76 days) centre (Table 66). Based on the average over locations LRB 334 (58.03 days) had the earliest flowering.

Maturity period showed wide variation among the locations but very little among the entries. The earliest maturity was observed at Bangalore (78.17 days), while it was late at Hisar (160.65 days) centre (Table 67). On the basis of average over the locations LRB 18 (105.85 days) was the earliest in maturity.

Weight of 100 seeds was almost uniform but slightly higher at Ludhiana (7.31 g) followed by Hisar (6.38 g) and Bangalore (6.28 g) centres (Table 68). Based on the average over locations LRB 99 (6.14 g) had the boldest seed.

2.2.3 FABA BEAN (*Vicia faba*)

2.2.3.1 Initial Varietal Trial

The Initial Varietal Trial comprising nine entries was conducted at six locations. Results have been received from all the centres. The summary performance of the entries has been presented in table 69.

Significant differences were observed among the entries for seed yield at all the centres. Mean seed yield levels were relatively low at many centres (Table 70). 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 608 (19.25 q/ha) followed by HB 613 (18.66 q/ha) as against the check Vikrant (17.37 q/ha).

Plant height was the highest at Delhi (83.60 cm) followed by Faizabad (79.84 cm) centre (Table 71). Moderate plant height was observed at other centres. Based on the average over the locations HB 613 (69.29 cm) showed the highest plant height.

Flowering time ranged from 55.74 days at Ranchi to 93.48 days at Delhi centre (Table 72). Based on the average over the locations HB 611 (68.93 days) was the earliest flowering line.

Maturity period varied among the locations with mean maturity period ranging from 110.89 days at Ranchi to 167.33 days at Hisar centre (Table 73). On the basis of overall mean, IGSV 10-2 (137.00 days) had the earliest maturity.

Mean seed weight was the highest at Hisar (29.38 g) and the lowest at Ludhiana (21.63 g) centre (Table 74). Based on the average over the locations HB 613 (28.12 g) had the boldest seed.

Pod yield recorded at three locations showed wide variation between the centres (Table 75). It was the highest at Hisar (194.67 q/ha) and the lowest at Ambikapur (20.29 q/ha). Based on the average performance, HB 608 (103.52 q/ha) had the highest pod yield.

2.2.4 WINGED BEAN (*Psophocarpus tetragonolobus*)

2.2.4.1 Initial Varietal Trial and Advanced Varietal Trial-I

The Initial and Advanced Varietal Trial-I consisting of 21 entries mainly from Akola and Bangalore centres was conducted at four locations. The summary of performance of the entries has been given in table 76.

Seed yield (Table 77) was the highest at Bhubaneshwar (14.20 q/ha) followed by Rahuri (8.59 q/ha). The average seed yield over the locations ranged from 2.09 to 14.20 q/ha. The entry EC 142665 yielded the highest (11.92 q/ha).

Average flowering time at three centres ranged between 56.49 and 68.60 days (Table 78). Based on single location data the entry EC 142654-4 flowered earliest (52.33 days) whereas, the entry, EC 142665 took the longest time for flowering (66.56 days).

Maturity period of the entries was recorded at four centres (Table 79). The average maturity period was the lowest at Rahuri (150.25 days) and Bangalore (156.73 days), while it was highest at Ranchi (181.40 days). The entry EC 142662 matured earliest (107.00 days) among all the entries.

100 seed weight recorded at four locations (Table 80) showed that it was the highest at Ranchi (33.31 g) and lowest at Bangalore (22.68 g). Based on the average, the entry EC 142665 (29.88 g) showed the highest 100 seed weight followed by IC 026945 (29.75 g).

Green pod yield (Table 81) of the entries was the highest at Rahuri (52.68 q/ha) and very low at Bangalore (3.48 q/ha), therefore, data from Bangalore was not included in over all mean. Based on the average performance over the three locations, the entry IC 95248 was the highest (61.17 q/ha) whereas, the check AKWB-1 was the lowest yielder (40.24 q/ha).

2.2.5 KALINGADA (*Citrullus lanatus*)

Kalingada is primarily a vegetable crop grown for its ripe fruits which are used as vegetable. However, its seed yields useful oil. In Kalingada one Initial Varietal Trial was proposed to be conducted during the year.

2.2.5.1 Initial Varietal Trial

The Advanced Varietal Trial consisting of 18 entries was planned to be conducted at three locations. Results have been received from two locations. The summary of performance of the entries has been given in table 82. Seed yield levels were higher at Delhi and ranged from 6.55 to 9.21 q/ha while seed yield at Mandor was quite low (0.91 q/ha) centre (Table 83). The entry, SKNK 679 was the highest yielder.

Number of fruits and fruit diameter recorded at two cenres showed that three was consider variation both the centres (Table 83). Flowering time, plant height, maturity period were recorded at Delhi while fruit weight, fruit yield, days taken to fruit setting and 100 seed weight were recorded at Mandor (Table 84). All the characters showed considerable variation at the above two centres.

2.2.6 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 Advanced Varietal Trial was proposed to be conducted.

2.2.6.1 Advanced Varietal Trial-I

The Advanced Varietal Trial-I on ten Kankoda entries was planned to be conducted at five locations. The results have been received from five centres. The performance of the entries has been presented in table 85.

Fruit yield was the highest at Ambikapur centre (17.36 q/ha) and lowest at Ranchi (6.18 q/ha) centre (Table 86). Fruit yield at other centes was moderate. Based on average RMF 37 (13.50 q/ha) was the highest yielder. For days to fruit setting considerable variation was observed (Table 87) at most of the locations (22.85 – 70.33 days). Earliest fruit setting (22.85 days) was

observed at Ambikapur centre. Based on average Phule MD 05-2 (42.67 days) had the earliest fruit setting.

Number of fruits per plant showed wide variation (29.74 – 102.78) among the centres (Table 88). Highest number of fruits was observed at Bhubaneswar (102.78) followed by Rahuri (44.11) centre. Based on average over locations average fruit number was the highest in RMF 7-P-1 (57.69).

Days taken to first picking (Table 89) was the lowest at Ambikapur (46.22 days) and the days taken for last picking (Table 90) was also the lowest at Ambikapur (69.63 days). Number of pickings recorded at five locations showed that it was the highest (8.07) at Bhubaneshwar and the lowest at Ambikapur (Table 91). Based on average over the locations RMF 7-P-1 had highest number of pickings (4.87). Individual fruit weight was the highest (10.93 g) at Rahuri centre (Table 92).

2.2.7 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.

2.2.7.1 Initial Varietal Trial

In the Initial Varietal Trial 15 entries were proposed to be evaluated at two locations. Results have been received from Mandor centre only. The performance of the entries and yield attributes have been given in tables 93 and 94. Seed yield of the entries ranged from 0.48 to 1.76 q/ha, the entry RMT 407 being the highest yielder.

2.2.8 JATROPHA (*Jatropha* spp.)

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

2.2.8.1 Initial Varietal Trial

The data of the trial with eight entries were received from four centres. The summary of performance of the entries has been given in table 95. The seed yield recorded in eight genotypes at three locations has been presented in table 96. Seed yield was higher at Hisar (15.11 q/ha) centre as compared to that of other centres. The genotype JH-1 (10.28 q/ha) was the highest yielder based on the average over three locations followed closely by Chhatrapati (8.10 q/ha).

Plant height was high at S.K. Nagar (223.84 cm) and moderate at Bhubaneswar (189.25 cm) (Table 97). Chattrapati had the highest plant height (222.55 cm) based on the average over the locations.

Number of branches per plant (Table 98) was the highest at Hisar (15.81) followed by Bhubaneswar (13.29). Based on the average over the locations, entry JH-1 had the highest number of branches (15.93).

100 seed weight (Table 99) recorded at four locations showed that it was the highest at Ambikapur (69.34 g) and lowest at S.K. Nagar (40.54 g). Based on the average over four locations, entry Chattrapati showed the highest test weight (59.97 g).

Table 44. Performance of Grain amaranth entries in Initial Varietal Trial (IVT) during Rabi 2005-06 (Plains)

S. No.	Genotypes	Mean maturity duration (days)	Mean seed weight (g/10ml)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety			
				Mean	Location	Rank	Annapurna	GA 1	GA 2	Suvarna
	IVT									
1	BGA 5	123.78	14.53	13.72	6	3	36.37	13.28	7.34	11.81
2	IC268367	124.15	17.33	11.47	5	10	13.99	-5.31	-10.27	-6.54
3	IGAS 1	123.75	17.43	9.25	5	12	-8.06	-23.62	-27.63	-24.62
4	RMA 9	120.69	14.63	12.39	6	6	23.11	2.27	-3.09	0.94
5	SKNA 501	113.78	15.54	13.72	6	2	36.41	13.31	7.37	11.84
6	SKNA 502	115.67	15.66	13.65	6	4	35.70	12.73	6.82	11.26
7	SKNA 503	114.33	15.84	13.89	6	1	38.02	14.66	8.65	13.16
8	SKNA 504	121.00	15.43	12.38	6	7	23.02	2.20	-3.16	0.86
9	Annapurna (C)	100.75	18.10	10.06	4	11	0.00	-16.92	-21.27	-18.00
10	GA 1 (C)	121.42	15.61	12.11	6	9	20.36	0.00	-5.26	-1.32
11	GA 2 (C)	116.74	15.47	12.78	6	5	27.05	5.55	0.00	4.17
12	Suvarna (C)	117.19	17.95	12.27	4	8	21.99	1.34	-3.97	0.00
	Mean	**118.00**	**15.44**	**12.25**						

Table 45. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Grain Amaranth - Rabi 2005-06 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Mandor	Ranchi	S.K. Nagar	Mean	Rank	Location	Frequency
	IVT										
1	BGA 5	3.65	***8.08***	20.15	23.65	4.70	22.09	13.72	3	6	1/6
2	IC268367	3.19	-	***23.87***	8.96	4.85	16.46	11.47	10	5	1/5
3	IGAS 1	4.76	-	17.36	4.02	5.48	14.63	9.25	12	5	0/5
4	RMA 9	2.81	5.93	16.89	23.59	4.54	20.55	12.39	6	6	0/6
5	SKNA 501	***10.56***	6.62	16.03	19.90	***7.06***	22.18	13.72	2	6	2/6
6	SKNA 502	9.65	***7.39***	17.36	18.54	6.87	22.10	13.65	4	6	1/6
7	SKNA 503	10.00	6.53	19.22	21.67	6.05	19.85	13.89	1	6	0/6
8	SKNA 504	1.74	5.63	20.15	22.44	5.13	19.17	12.38	7	6	0/6
9	Annapurna (C)	**8.54**	5.38	-	15.21	-	11.12	10.06	11	4	
10	GA 1 (C)	1.22	4.02	19.38	**21.98**	5.69	20.37	12.11	9	6	
11	GA 2 (C)	2.67	**5.94**	**20.30**	20.83	**6.17**	**20.77**	12.78	5	6	
12	Suvarna (C)	3.99	5.04	-	21.72	-	18.34	12.27	8	4	
	Mean	**5.23**	**6.06**	**19.07**	**18.54**	**5.65**	**18.97**	**12.25**			
	CD (0.05)	**1.96**	**0.82**	**3.19**	**2.57**	**0.72**	**2.70**				
	CV (%) Error	**22.21**	**9.39**	**9.75**	**10.01**	**7.43**	**10.27**				

Table 46. Plant height (cm) in Initial Varietal Trial (IVT) on Grain Amaranth - Rabi 2005-06 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Mandor	Ranchi	S.K. Nagar	Mean	Rank
	IVT								
1	BGA 5	101.80	131.85	106.20	128.70	69.00	129.25	111.13	7
2	IC268367	102.00	-	98.53	108.60	***92.63***	150.75	110.50	8
3	IGAS 1	98.20	-	112.73	147.43	69.30	156.50	116.83	5
4	RMA 9	102.70	125.60	137.93	112.35	75.33	178.50	122.07	4
5	SKNA 501	86.70	103.10	96.20	95.40	60.53	105.00	91.16	10
6	SKNA 502	78.90	103.50	110.07	90.70	60.53	124.25	94.66	9
7	SKNA 503	89.80	101.68	99.13	95.85	55.27	101.50	90.54	11
8	SKNA 504	98.80	119.35	128.93	123.70	74.40	143.00	114.70	6
9	Annapurna (C)	71.30	67.55	-	75.30	-	85.25	74.85	12
10	GA 1 (C)	**110.60**	125.70	**150.90**	**145.35**	**76.07**	**182.00**	131.77	1
11	GA 2 (C)	107.50	**130.55**	150.67	120.85	74.47	169.50	125.59	2
12	Suvarna (C)	99.40	124.95	-	137.65	-	128.00	122.50	3
	Mean	**95.64**	**113.38**	**119.13**	**115.16**	**70.75**	**137.79**	**108.64**	
	CD (0.05)	**8.15**	**15.96**	**18.89**	**12.47**	**8.85**	**16.67**		
	CV (%) Error	**5.04**	**9.71**	**9.25**	**7.81**	**7.30**	**8.73**		

Table 47. Days to 50% flowering in Initial Varietal Trial (IVT) on Grain Amaranth - Rabi 2005-06 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Mandor	Ranchi	S.K. Nagar	Mean	Rank
	IVT								
1	BGA 5	87.00	57.00	50.00	61.50	92.67	58.00	67.69	12
2	IC268367	84.67	-	***47.67***	43.50	81.00	55.00	62.37	7
3	IGAS 1	86.33	-	50.33	56.75	***77.67***	53.00	64.82	11
4	RMA 9	85.00	49.25	51.33	44.75	78.67	53.00	60.33	5
5	SKNA 501	75.67	46.50	50.67	39.25	***70.00***	51.00	55.51	3
6	SKNA 502	79.33	46.25	51.00	39.50	***69.00***	59.00	57.35	4
7	SKNA 503	78.33	45.50	54.00	38.75	***66.00***	49.00	55.26	2
8	SKNA 504	85.33	49.50	60.00	49.00	85.33	57.00	64.36	9
9	Annapurna (C)	**76.33**	**44.25**	-	**34.75**	-	**41.00**	49.08	1
10	GA 1 (C)	88.00	52.50	**51.00**	50.00	91.00	54.00	64.42	10
11	GA 2 (C)	82.67	49.75	55.00	43.50	**82.67**	51.25	60.81	6
12	Suvarna (C)	87.33	52.50	-	60.25	-	57.00	64.27	8
	Mean	**83.00**	**49.30**	**52.10**	**46.79**	**79.40**	**53.19**	**60.63**	
	CD (0.05)	**3.36**	**1.45**	**2.56**	**2.88**	**4.37**	**3.02**		
	CV (%) Error	**2.39**	**2.03**	**2.86**	**4.44**	**3.21**	**4.09**		

Table 48. Days to maturity in Initial Varietal Trial (IVT) on Grain Amaranth - Rabi 2005-06 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Mandor	Ranchi	S.K. Nagar	Mean	Rank	Location	Frequency
	IVT										
1	BGA 5	143.33	103.25	110.00	120.75	156.33	109.00	123.78	11	6	0/6
2	IC268367	140.00	-	103.33	111.75	157.67	108.00	124.15	12	5	0/5
3	IGAS 1	137.33	-	98.00	118.75	157.67	107.00	123.75	10	5	0/5
4	RMA 9	138.67	93.00	108.33	115.50	157.67	111.00	120.69	7	6	0/6
5	SKNA 501	128.67	91.00	99.00	113.00	144.00	107.00	113.78	2	6	0/6
6	SKNA 502	132.67	90.50	105.00	110.50	146.33	109.00	115.67	4	6	0/6
7	SKNA 503	131.33	92.00	104.00	111.00	142.67	105.00	114.33	3	6	0/6
8	SKNA 504	139.67	92.25	112.00	117.75	154.33	110.00	121.00	8	6	0/6
9	Annapurna (C)	**123.00**	**79.50**	-	117.50	-	**83.00**	100.75	1	4	
10	GA 1 (C)	142.33	96.50	104.00	120.00	**155.67**	110.00	121.42	9	6	
11	GA 2 (C)	135.67	92.00	**97.33**	**116.75**	158.67	100.00	116.74	5	6	
12	Suvarna (C)	140.00	100.75	-	120.00	-	108.00	117.19	6	4	
	Mean	**136.06**	**93.08**	**104.10**	**116.10**	**153.10**	**105.58**	**118.00**			
	CD (0.05)	**3.05**	**1.80**	**4.79**	**3.13**	**5.39**	**4.79**				
	CV (%) Error	**1.33**	**1.33**	**2.68**	**1.95**	**2.05**	**3.27**				

Table 49. Seed weight (g/10ml) in Initial Varietal Trial (IVT) on Grain Amaranth - Rabi 2005-06 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Mandor	Ranchi	S.K. Nagar	Mean	Rank
	IVT							
1	BGA 5	5.52	8.06	7.93	6.13	4.50	6.43	11
2	IC268367	5.33	-	7.90	***7.97***	4.81	6.50	9
3	IGAS 1	4.60	-	8.00	7.13	5.00	6.18	12
4	RMA 9	5.43	7.80	8.00	7.03	4.49	6.55	8
5	SKNA 501	6.47	7.84	8.18	6.63	4.86	6.79	3
6	SKNA 502	6.32	7.80	8.00	6.83	4.94	6.78	4
7	SKNA 503	6.00	8.03	8.10	6.83	5.03	6.80	2
8	SKNA 504	5.82	7.71	8.05	6.47	4.91	6.59	7
9	Annapurna (C)	**7.60**	**7.97**	8.00	-	4.89	7.11	1
10	GA 1 (C)	5.27	7.66	**8.25**	6.80	5.01	6.60	6
11	GA 2 (C)	4.88	**7.97**	8.05	**7.20**	4.93	6.61	5
12	Suvarna (C)	5.32	7.43	7.98	-	5.11	6.46	10
	Mean	**5.71**	**7.83**	**8.04**	**6.90**	4.87	**6.67**	
	CD (0.05)	**0.59**	**0.40**	**0.15**	**0.32**	0.11		
	CV (%) Error	**6.06**	**3.55**	**1.34**	**2.67**	**1.66**		

Table 50. Inflorescence length (cm) in Initial Varietal Trial (IVT) on Grain Amaranth - Rabi 2005-06 (Plains)

S.No.	Genotypes	Faizabad	S.K. Nagar	Mean	Rank
	IVT				
1	BGA 5	23.07	65.25	44.16	12
2	IC268367	32.93	87.50	60.22	5
3	IGAS 1	30.20	88.25	59.23	6
4	RMA 9	33.73	92.75	63.24	3
5	SKNA 501	36.13	76.25	56.19	7
6	SKNA 502	33.13	79.00	56.07	8
7	SKNA 503	36.47	67.75	52.11	11
8	SKNA 504	30.20	77.25	53.73	9
9	Annapurna (C)	-	77.00	77.00	1
10	GA 1 (C)	31.47	**100.25**	65.86	2
11	GA 2 (C)	**33.00**	90.75	61.88	4
12	Suvarna (C)	-	52.50	52.50	10
	Mean	**32.03**	**79.54**	**55.79**	
	CD (0.05)	**7.23**	**11.01**		
	CV (%) Error	**13.17**	**9.99**		

Table 51. Performance of Grain amaranth entries in Initial Varietal Trial (IVT) during - Kharif 2006 (Plains)

S. No.	Genotypes	Mean maturity duration (days)	Mean seed weight (g/10ml)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety			
				Mean	Location	Rank	Annapurna	GA 1	GA 2	Suvarna
	IVT									
1	BGA-10	87.13	7.84	4.62	1	7	-0.93	-30.68	-11.39	-18.43
2	BGA-15	92.33	7.19	6.08	1	3	30.54	-8.66	16.76	7.48
3	RMA-19	94.96	7.91	2.37	1	9	-49.07	-64.36	-54.45	-58.07
4	RMA-24	94.92	7.70	2.42	1	8	-48.14	-63.71	-53.61	-57.30
5	SKNA-601	81.00	7.89	8.13	1	1	74.39	22.02	55.98	43.58
6	Annapurna (C)	80.13	7.48	4.66	1	6	0.00	-30.03	-10.56	-17.67
7	GA-1 (C)	94.71	8.03	6.66	1	2	42.92	0.00	27.83	17.67
8	GA-2 (C)	95.00	8.23	5.21	1	5	11.87	-21.72	0.00	-7.89
9	Suvarna (C)	81.83	7.60	5.66	1	4	21.53	-14.96	8.70	0.00
	Mean	**88.91**	**7.71**	**5.09**						

Table 52. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore*	Mettupalayam	Rahuri**	Mean	Rank	Location	Frequency
	IVT							
1	BGA-10	0.28	4.62	-	4.62	7	1	0/1
2	BGA-15	0.46	6.08	-	6.08	3	1	0/1
3	RMA-19	0.13	2.37	-	2.37	9	1	0/1
4	RMA-24	0.36	2.42	-	2.42	8	1	0/1
5	SKNA-601	0.18	8.13	-	8.13	1	1	0/1
6	Annapurna (C)	0.27	4.66	-	4.66	6	1	
7	GA-1 (C)	0.09	**6.66**	-	6.66	2	1	
8	GA-2 (C)	-	5.21	-	5.21	5	1	
9	Suvarna (C)	**0.29**	5.66	-	5.66	4	1	
	Mean	**0.28**	**5.09**		**5.09**			
	CD (0.05)	**0.28**	**2.35**					
	CV (%) Error	**73.70**	**26.67**					

*** Data from Bangalore not included in the overall mean due to high C.V.**
**** Trial failed due to heavy rain fall**

Table 53. Plant height (cm) in Initial Varietal Trial (IVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank
	IVT				
1	BGA-10	40.85	171.47	106.16	8
2	BGA-15	53.75	182.53	118.14	6
3	RMA-19	54.20	214.93	134.57	2
4	RMA-24	57.60	204.00	130.80	4
5	SKNA-601	46.00	178.93	112.47	7
6	Annapurna (C)	28.25	138.87	83.56	9
7	GA-1 (C)	47.33	189.93	118.63	5
8	GA-2 (C)	-	**232.73**	232.73	1
9	Suvarna (C)	**49.80**	217.47	133.63	3
	Mean	**46.78**	**192.32**	**119.55**	
	CD (0.05)	**18.06**	**23.31**		
	CV (%) Error	**26.01**	**7.00**		

Table 54. Days to 50% flowering in Initial Varietal Trial (IVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank
	IVT				
1	BGA-10	55.50	50.00	52.75	3
2	BGA-15	55.00	52.33	53.67	5
3	RMA-19	58.00	56.67	57.33	8
4	RMA-24	57.75	56.33	57.04	7
5	SKNA-601	38.75	38.00	38.38	2
6	Annapurna (C)	**38.50**	**36.00**	37.25	1
7	GA-1 (C)	58.75	58.00	58.38	9
8	GA-2 (C)	-	56.67	56.67	6
9	Suvarna (C)	53.50	53.00	53.25	4
	Mean	**50.58**	**50.78**	**50.68**	
	CD (0.05)	**3.33**	**0.84**		
	CV (%) Error	**4.36**	**0.96**		

Table 55. Days to maturity in Initial Varietal Trial (IVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank	Location	Frequency
	IVT						
1	BGA-10	93.25	81.00	87.13	4	2	0/2
2	BGA-15	94.00	90.67	92.33	5	2	0/2
3	RMA-19	95.25	94.67	94.96	8	2	0/2
4	RMA-24	95.50	94.33	94.92	7	2	0/2
5	SKNA-601	88.00	74.00	81.00	2	2	0/2
6	Annapurna (C)	**86.25**	**74.00**	80.13	1	2	
7	GA-1 (C)	94.75	94.67	94.71	6	2	
8	GA-2 (C)	-	95.00	95.00	9	1	
9	Suvarna (C)	90.00	73.67	81.83	3	2	
	Mean	**92.04**	**85.78**	**88.91**			
	CD (0.05)	**3.30**	**0.91**				
	CV (%) Error	**2.43**	**0.61**				

Table 56. Seed weight (g/10ml) in Initial Varietal Trial (IVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank
	IVT				
1	BGA-10	7.25	8.43	7.84	5
2	BGA-15	7.45	6.93	7.19	9
3	RMA-19	7.65	8.17	7.91	3
4	RMA-24	7.58	7.83	7.70	6
5	SKNA-601	6.95	8.83	7.89	4
6	Annapurna (C)	7.00	7.97	7.48	8
7	GA-1 (C)	**7.70**	**8.37**	8.03	2
8	GA-2 (C)	-	8.23	8.23	1
9	Suvarna (C)	7.03	8.17	7.60	7
	Mean	**7.31**	**8.10**	**7.71**	
	CD (0.05)	**1.03**	**0.68**		
	CV (%) Error	**9.55**	**4.82**		

Table 57. Performance of Grain amaranth entries in Advanced Varietal Trial (AVT) during - Kharif 2006 (Plains)

S. No.	Genotypes	Mean maturity duration (days)	Mean seed volume weight (g/10ml)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety			
				Mean	Location	Rank	Annapurna	GA 1	GA 2	Suvarna
	AVT-I									
1	RMA-9	94.58	6.89	2.55	1	11	-57.71	-41.65	-46.32	-69.24
2	SKNA-501	88.75	7.08	3.66	1	9	-39.25	-16.17	-22.88	-55.81
3	SKNA-502	86.83	6.85	4.70	1	5	-22.11	7.48	-1.12	-43.35
4	SKNA-503	86.58	7.07	2.83	1	10	-53.12	-35.32	-40.49	-65.90
	AVT-II									
5	RMA-3	94.58	6.98	4.76	1	3	-21.12	8.85	0.14	-42.62
6	RMA-4	94.92	6.89	4.55	1	6	-24.60	4.04	-4.28	-45.15
7	SKNA-21	94.83	6.56	3.83	1	8	-36.54	-12.43	-19.44	-53.84
8	Annapurna (C)	77.67	6.65	6.03	1	2	0.00	37.99	26.95	-27.26
9	GA-1 (C)	94.92	6.75	4.37	1	7	-27.58	0.00	-8.07	-47.33
10	GA-2 (C)	94.25	6.91	4.75	1	4	-21.17	8.77	0.00	-42.66
11	Suvarna (C)	81.96	7.06	8.29	1	1	37.48	89.70	74.53	0.00
	Mean	89.99	6.88	4.57						

Table 58. Grain yield (q/ha) in Advanced Varietal Trial (AVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore*	Mettupalayam	Mean	Rank	Location	Frequency
	AVT-I						
1	RMA-9	0.35	2.55	2.55	11	1	0/1
2	SKNA-501	1.04	3.66	3.66	9	1	0/1
3	SKNA-502	2.05	4.70	4.70	5	1	0/1
4	SKNA-503	1.72	2.83	2.83	10	1	0/1
	AVT-II						
5	RMA-3	1.16	4.76	4.76	3	1	0/1
6	RMA-4	0.69	4.55	4.55	6	1	0/1
7	SKNA-21	0.32	3.83	3.83	8	1	0/1
8	Annapurna (C)	0.91	6.03	6.03	2	1	
9	GA-1 (C)	0.83	4.37	4.37	7	1	
10	GA-2 (C)	1.04	4.75	4.75	4	1	
11	Suvarna (C)	**2.29**	**8.29**	8.29	1	1	
	Mean	**1.13**	**4.57**	**4.57**			
	CD (0.05)	**1.00**	**1.24**				
	CV (%) Error	**64.01**	**15.89**				

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

Table 59. Plant height (cm) in Advanced Varietal Trial (AVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank
	AVT-I				
1	RMA-9	72.25	243.80	158.03	2
2	SKNA-501	73.35	204.00	138.68	6
3	SKNA-502	72.95	213.13	143.04	5
4	SKNA-503	73.05	199.17	136.11	8
	AVT-II				
5	RMA-3	97.15	221.00	159.08	1
6	RMA-4	67.80	179.40	123.60	9
7	SKNA-21	74.90	214.13	144.52	4
8	Annapurna (C)	68.55	149.00	108.78	11
9	GA-1 (C)	83.35	189.93	136.64	7
10	GA-2 (C)	76.40	**225.87**	151.13	3
11	Suvarna (C)	**83.85**	149.00	116.43	10
	Mean	**76.69**	**198.95**	**137.82**	
	CD (0.05)	**20.12**	**24.90**		
	CV (%) Error	**18.93**	**7.33**		

Table 60. Days to 50% flowering in Advanced Varietal Trial (AVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank
	AVT-I				
1	RMA-9	52.75	52.00	52.38	7
2	SKNA-501	52.00	46.67	49.33	4
3	SKNA-502	49.00	48.33	48.67	2
4	SKNA-503	50.00	47.67	48.83	3
	AVT-II				
5	RMA-3	50.50	56.67	53.58	8
6	RMA-4	54.00	58.00	56.00	11
7	SKNA-21	55.50	54.67	55.08	10
8	Annapurna (C)	**32.50**	**36.00**	34.25	1
9	GA-1 (C)	54.50	55.33	54.92	9
10	GA-2 (C)	49.25	54.33	51.79	6
11	Suvarna (C)	49.50	52.67	51.08	5
	Mean	**49.95**	**51.12**	**50.54**	
	CD (0.05)	**6.03**	**0.85**		
	CV (%) Error	**8.71**	**0.97**		

Table 61. Days to maturity in Advanced Varietal Trial (AVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank	Location	Frequency
	AVT-I						
1	RMA-9	95.50	93.67	94.58	7	2	0/2
2	SKNA-501	93.50	84.00	88.75	5	2	0/2
3	SKNA-502	95.00	78.67	86.83	4	2	0/2
4	SKNA-503	92.50	80.67	86.58	3	2	0/2
	AVT-II						
5	RMA-3	94.50	94.67	94.58	8	2	0/2
6	RMA-4	95.50	94.33	94.92	10	2	0/2
7	SKNA-21	95.00	94.67	94.83	9	2	0/2
8	Annapurna (C)	**87.00**	**68.33**	77.67	1	2	
9	GA-1 (C)	95.50	94.33	94.92	11	2	
10	GA-2 (C)	94.50	94.00	94.25	6	2	
11	Suvarna (C)	91.25	72.67	81.96	2	2	
	Mean	**93.61**	**86.36**	**89.99**			
	CD (0.05)	**2.34**	**3.35**				
	CV (%) Error	**1.80**	**2.27**				

Table 62. Seed weight (g/10ml) in Advanced Varietal Trial (AVT) on Grain Amaranth - Kharif 2006 (Plains)

S.No.	Genotypes	Bangalore	Mettupalayam	Mean	Rank
	AVT-I				
1	RMA-9	5.35	8.43	6.89	6
2	SKNA-501	5.83	8.33	7.08	1
3	SKNA-502	5.53	8.17	6.85	8
4	SKNA-503	5.80	8.33	7.07	2
	AVT-II				
5	RMA-3	5.60	8.37	6.98	4
6	RMA-4	5.45	8.33	6.89	7
7	SKNA-21	4.93	8.20	6.56	11
8	Annapurna (C)	5.13	8.17	6.65	10
9	GA-1 (C)	5.18	8.33	6.75	9
10	GA-2 (C)	5.53	8.30	6.91	5
11	Suvarna (C)	**5.55**	**8.57**	7.06	3
	Mean	**5.44**	**8.32**	**6.88**	
	CD (0.05)	**1.00**	**0.13**		
	CV (%) Error	**13.26**	**0.94**		

Table 63. Performance of Rice bean entries in Initial Varietal Trial (IVT) during Kharif, 2006 (Plains)

S. No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety			
				Mean	Location	Rank	RBL-1	RBL-6	RBL-35	RBL-50
	IVT									
1	LRB004	107.04	5.56	8.15	8	16	-2.21	0.94	-0.78	0.19
2	LRB018	105.85	5.94	8.29	8	11	-0.44	2.77	1.02	2.01
3	LRB040-1	110.11	5.89	6.80	8	24	-18.36	-15.73	-17.17	-16.35
4	LRB046	108.37	5.82	6.96	8	23	-16.40	-13.71	-15.18	-14.34
5	LRB065	109.52	5.56	8.28	8	13	-0.63	2.57	0.82	1.81
6	LRB068	109.48	5.92	8.84	8	2	6.15	9.57	7.70	8.76
7	LRB071-1	108.48	5.79	7.23	8	22	-13.20	-10.41	-11.93	-11.07
8	LRB071-2	106.48	5.88	7.81	8	20	-6.29	-3.27	-4.92	-3.98
9	LRB074-1	109.96	6.00	8.40	8	7	0.80	4.04	2.27	3.28
10	LRB080	107.48	6.13	8.49	8	6	1.97	5.25	3.46	4.48
11	LRB081	110.15	5.84	8.35	8	9	0.27	3.51	1.74	2.74
12	LRB087	108.04	6.00	8.80	8	4	5.61	9.02	7.16	8.21
13	LRB099	109.19	6.14	8.37	8	8	0.50	3.74	1.97	2.97
14	LRB102	108.04	5.83	8.29	8	12	-0.47	2.73	0.98	1.98
15	LRB107	108.93	5.85	8.81	8	3	5.78	9.19	7.33	8.38
16	LRB117	107.85	5.99	8.00	8	19	-3.97	-0.88	-2.57	-1.61
17	LRB118	107.52	5.84	7.59	8	21	-8.85	-5.91	-7.52	-6.61
18	LRB309	107.00	5.78	8.75	8	5	5.04	8.43	6.58	7.63
19	LRB334	106.67	5.88	10.18	8	1	22.21	26.15	24.00	25.22
20	LRB463	108.89	5.75	8.20	8	15	-1.61	1.56	-0.17	0.81
21	RBL-1 (C)	110.52	5.77	8.33	8	10	0.00	3.25	1.48	2.48
22	RBL-6 (C)	108.52	5.75	8.07	8	18	-3.14	0.00	-1.73	-0.76
23	RBL-35 (C)	108.07	5.90	8.21	8	14	-1.38	1.80	0.00	1.04
24	RBL-50 (C)	109.56	5.74	8.13	8	17	-2.39	0.76	-0.96	0.00
	Mean	**108.40**	**5.86**	**8.22**						

Table 64. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Rice bean : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore*	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	S.K. Nagar*	Mean	Rank	Location	Frequency
	IVT														
1	LRB004	6.39	0.65	10.42	3.13	11.53	16.59	4.47	3.02	9.62	4.48	8.15	16	8	0/8
2	LRB018	6.81	0.83	14.32	4.33	9.03	15.13	***7.11***	3.75	5.87	3.42	8.29	11	8	1/8
3	LRB040-1	6.32	0.92	14.58	2.90	7.64	9.85	2.53	3.95	6.62	13.74	6.80	24	8	0/8
4	LRB046	5.43	0.83	11.46	3.33	5.07	16.45	3.19	3.64	7.13	2.06	6.96	23	8	0/8
5	LRB065	6.81	0.23	10.16	3.50	***14.44***	18.12	3.17	3.95	6.07	8.31	8.28	13	8	1/8
6	LRB068	***9.24***	0.81	14.06	4.10	11.81	15.96	3.09	3.85	8.64	7.84	8.84	2	8	1/8
7	LRB071-1	6.25	0.75	13.28	3.80	8.68	13.95	2.88	3.95	5.05	3.36	7.23	22	8	0/8
8	LRB071-2	4.49	0.64	15.36	3.57	7.99	14.02	3.61	3.50	9.92	8.90	7.81	20	8	0/8
9	LRB074-1	6.46	0.47	14.58	3.13	10.42	16.45	3.22	3.68	9.22	6.82	8.40	7	8	0/8
10	LRB080	5.56	0.84	13.80	3.00	11.46	19.30	5.76	3.15	5.92	5.88	8.49	6	8	0/8
11	LRB081	7.50	0.36	14.32	3.03	10.42	17.63	4.09	3.36	6.46	8.07	8.35	9	8	0/8
12	LRB087	***8.61***	0.72	13.28	3.57	12.15	***19.72***	4.37	3.71	4.98	3.63	8.80	4	8	2/8
13	LRB099	***9.93***	0.43	15.63	4.27	6.25	14.17	4.03	3.64	9.06	5.44	8.37	8	8	1/8
14	LRB102	7.64	0.16	13.28	3.43	12.50	14.86	4.90	3.92	5.79	0.79	8.29	12	8	0/8
15	LRB107	7.43	0.37	12.24	3.20	***17.36***	15.41	5.58	3.64	5.62	5.33	8.81	3	8	1/8
16	LRB117	6.74	0.59	13.28	2.57	***16.32***	9.30	5.20	2.95	7.63	7.00	8.00	19	8	1/8
17	LRB118	4.93	0.88	13.28	3.50	11.45	13.47	5.42	3.57	5.13	9.70	7.59	21	8	0/8
18	LRB309	8.06	0.71	15.63	4.00	***17.02***	13.26	3.15	3.74	5.15	11.33	8.75	5	8	1/8
19	LRB334	8.12	0.95	15.10	5.00	***18.40***	***20.62***	3.99	3.99	6.22	6.36	10.18	1	8	2/8
20	LRB463	5.21	0.94	14.32	4.83	7.29	17.77	3.67	3.71	8.76	18.18	8.20	15	8	0/8
21	RBL-1 (C)	4.44	0.62	11.72	4.60	11.32	15.55	2.90	4.09	**12.03**	**23.00**	8.33	10	8	
22	RBL-6 (C)	5.69	0.88	**13.02**	**4.87**	**12.60**	13.88	4.12	**4.20**	6.17	10.64	8.07	18	8	
23	RBL-35 (C)	**6.60**	**1.34**	11.98	4.73	12.22	**15.89**	3.88	4.04	6.37	20.72	8.21	14	8	
24	RBL-50 (C)	4.93	0.87	11.98	4.00	9.97	15.62	**4.54**	3.99	10.02	7.54	8.13	17	8	
	Mean	**6.65**	**0.70**	**13.38**	**3.77**	**11.39**	**15.54**	**4.12**	**3.71**	**7.23**	**8.44**	**8.22**			
	CD (0.05)	**1.74**	**0.53**	**2.92**	**0.71**	**1.72**	**3.82**	**1.58**	**0.26**	**1.78**	**12.46**				
	CV (%) Error	**16.36**	**46.94**	**13.63**	**11.71**	**9.46**	**15.34**	**23.95**	**4.36**	**15.41**	**92.25**				

*** Data from Bangalore and S.K. Nagar not included in the overall mean due to high C.V.**

Table 65. Plant height (cm) in Initial Varietal Trial (IVT) on Rice bean : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	S.K. Nagar	Mean	Rank
	IVT												
1	LRB004	90.53	40.13	98.07	123.90	136.33	104.67	63.67	77.33	103.47	73.07	91.12	16
2	LRB018	89.60	40.53	103.80	130.73	135.83	108.33	64.00	77.00	118.27	77.00	94.51	5
3	LRB040-1	78.13	39.40	102.47	134.27	144.10	96.67	63.33	82.67	103.67	76.40	92.11	11
4	LRB046	69.40	41.27	91.53	126.43	127.30	104.00	64.00	82.33	114.73	81.93	90.29	21
5	LRB065	78.87	38.67	109.33	123.23	109.73	87.33	65.67	83.67	116.23	82.43	89.52	23
6	LRB068	96.47	40.47	100.93	120.73	118.10	94.33	62.33	85.00	116.93	73.47	90.88	17
7	LRB071-1	84.13	40.40	93.07	121.00	132.77	93.00	62.33	80.00	121.07	77.73	90.55	19
8	LRB071-2	78.40	42.53	94.53	129.93	114.00	103.00	66.00	83.67	129.93	77.27	91.93	12
9	LRB074-1	94.00	41.00	109.33	130.93	140.00	104.33	64.33	83.67	103.97	76.87	94.84	3
10	LRB080	88.87	40.67	107.67	131.50	124.10	105.00	65.00	76.67	94.57	78.13	91.22	15
11	LRB081	83.93	41.00	107.33	132.50	124.00	100.00	65.00	87.00	120.87	78.67	94.03	6
12	LRB087	90.80	39.83	101.93	120.73	146.87	104.33	64.00	80.33	98.80	79.80	92.74	9
13	LRB099	81.73	40.33	125.07	121.03	150.40	100.00	66.00	80.00	106.07	79.20	94.98	2
14	LRB102	98.73	44.43	87.67	130.53	137.23	83.00	67.67	82.00	115.27	77.00	92.35	10
15	LRB107	***114.13***	37.97	114.00	130.40	131.20	102.00	66.67	83.00	129.67	79.93	98.90	1
16	LRB117	84.27	41.73	109.67	125.57	127.73	102.67	66.00	76.67	120.80	74.07	92.92	8
17	LRB118	86.40	39.10	105.67	120.37	152.50	102.67	65.00	82.33	118.07	75.00	94.71	4
18	LRB309	87.40	40.87	109.53	121.13	109.40	96.33	64.00	84.33	118.33	77.07	90.84	18
19	LRB334	71.13	38.60	97.87	133.10	136.10	88.33	64.00	79.67	132.00	73.60	91.44	14
20	LRB463	82.13	41.53	86.00	131.30	126.17	91.67	63.00	84.00	126.00	73.00	90.48	20
21	RBL-1 (C)	78.00	39.00	**111.67**	120.63	132.87	88.33	63.33	82.00	104.13	71.33	89.13	24
22	RBL-6 (C)	72.73	40.40	99.80	127.10	118.73	**107.67**	64.00	82.00	**117.67**	68.53	89.86	22
23	RBL-35 (C)	**88.07**	**41.47**	85.33	132.53	**152.03**	97.67	**69.00**	**83.67**	110.73	**79.73**	94.02	7
24	RBL-50 (C)	87.33	39.00	88.33	**133.10**	137.07	97.00	67.33	83.00	111.00	73.67	91.68	13
	Mean	**85.63**	**40.43**	**101.69**	**127.20**	**131.86**	**98.43**	**64.82**	**81.75**	**114.68**	**76.45**	**92.29**	
	CD (0.05)	**24.81**	**4.80**	**14.80**	**3.70**	**20.70**	**25.04**	**1.60**	**4.11**	**16.04**	**9.34**		
	CV (%) Error	**18.11**	**7.41**	**9.10**	**1.82**	**9.81**	**15.90**	**1.54**	**3.14**	**8.74**	**7.64**		

Table 66. Days to 50% flowering in Initial Varietal Trial (IVT) on Rice bean : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	S.K. Nagar	Mean	Rank
	IVT												
1	LRB004	60.67	44.00	57.33	80.67	82.67	64.00	58.00	46.67	69.00	71.00	63.40	19
2	LRB018	60.67	46.00	57.33	81.00	87.67	65.00	48.00	48.00	69.00	66.00	62.87	14
3	LRB040-1	***59.00***	45.67	59.67	77.33	84.00	66.00	50.00	51.00	69.67	63.67	62.60	12
4	LRB046	62.00	45.00	59.67	82.00	84.33	64.00	47.33	52.00	64.67	70.33	63.13	17
5	LRB065	61.00	42.67	60.00	87.00	78.33	64.00	47.67	51.00	64.33	65.33	62.13	10
6	LRB068	61.00	45.00	60.67	85.00	84.33	64.00	49.00	50.00	70.33	61.67	63.10	16
7	LRB071-1	60.00	47.00	57.00	78.00	83.67	63.00	49.00	49.00	59.00	64.33	61.00	6
8	LRB071-2	62.67	46.33	55.33	78.67	93.33	64.00	48.00	48.00	66.67	71.33	63.43	21
9	LRB074-1	62.33	45.00	57.67	75.33	84.33	65.00	49.33	52.00	71.33	74.33	63.67	22
10	LRB080	61.67	48.33	56.00	79.00	85.33	63.00	48.00	50.00	66.00	62.67	62.00	9
11	LRB081	63.00	41.67	56.00	88.00	86.00	63.67	47.00	50.00	59.67	61.00	61.60	7
12	LRB087	60.00	45.33	56.00	84.00	85.00	59.67	47.00	50.00	56.33	65.33	60.87	5
13	LRB099	63.67	49.33	59.33	85.67	86.33	66.00	49.00	49.00	65.33	64.33	63.80	23
14	LRB102	62.33	44.00	60.33	81.00	93.33	63.67	47.00	48.67	59.33	74.33	63.40	20
15	LRB107	62.00	45.33	57.33	82.00	88.00	64.00	48.00	49.67	69.00	64.67	63.00	15
16	LRB117	63.67	47.67	60.67	80.00	87.33	65.00	48.00	48.67	68.33	62.33	63.17	18
17	LRB118	60.67	47.67	58.00	80.00	86.00	63.67	46.00	52.00	66.33	59.00	61.93	8
18	LRB309	61.00	44.33	55.33	78.00	82.00	64.33	47.00	47.33	60.00	60.67	60.00	3
19	LRB334	59.67	44.33	56.00	77.00	75.00	56.00	47.00	48.00	54.67	62.67	58.03	1
20	LRB463	60.00	44.67	55.33	78.00	84.33	62.67	48.00	51.67	65.67	74.33	62.47	11
21	RBL-1 (C)	63.33	44.00	58.67	**81.00**	83.33	64.00	**46.00**	**48.67**	59.67	60.00	60.87	4
22	RBL-6 (C)	**61.00**	44.00	60.00	84.00	**77.33**	63.33	47.00	59.00	70.67	59.67	62.60	13
23	RBL-35 (C)	62.67	**43.33**	**56.00**	84.33	85.33	**55.33**	47.00	50.00	**48.33**	**58.33**	59.07	2
24	RBL-50 (C)	63.67	45.67	62.33	**81.00**	87.00	64.00	48.00	52.00	73.00	76.67	65.33	24
	Mean	**61.57**	**45.26**	**58.00**	**81.17**	**84.76**	**63.22**	**48.18**	**50.10**	**64.43**	**65.58**	**62.23**	
	CD (0.05)	**1.69**	**4.33**	**1.34**	**1.66**	**4.05**	**1.18**	**6.80**	**6.02**	**5.08**	**2.16**		
	CV (%) Error	**1.72**	**5.98**	**1.44**	**1.27**	**2.99**	**1.17**	**8.82**	**7.51**	**4.93**	**2.05**		

Table 67. Days to maturity in Initial Varietal Trial (IVT) on Rice bean : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	Mean	Rank	Location	Frequency
	IVT													
1	LRB004	103.33	76.67	93.67	***125.00***	169.67	106.33	82.67	86.00	120.00	107.04	5	9	1/9
2	LRB018	104.00	79.33	96.33	***127.00***	143.67	105.67	86.67	88.67	121.33	105.85	1	9	1/9
3	LRB040-1	101.33	80.00	96.33	129.67	174.00	109.00	87.67	89.00	124.00	110.11	22	9	0/9
4	LRB046	104.33	79.33	95.33	131.33	157.33	107.00	94.33	86.00	120.33	108.37	12	9	0/9
5	LRB065	106.00	77.67	96.33	131.00	165.33	107.33	94.00	89.00	119.00	109.52	19	9	0/9
6	LRB068	108.00	78.33	97.00	***127.00***	164.00	105.33	89.00	88.33	128.33	109.48	18	9	1/9
7	LRB071-1	103.00	77.33	93.67	***124.00***	172.33	105.67	89.33	88.00	123.00	108.48	13	9	1/9
8	LRB071-2	105.00	79.00	90.33	***124.67***	135.33	108.67	98.00	88.67	128.67	106.48	2	9	1/9
9	LRB074-1	105.67	76.00	92.67	129.33	161.67	104.67	94.67	91.00	134.00	109.96	21	9	0/9
10	LRB080	103.33	78.00	89.67	131.00	163.00	104.67	95.67	84.67	117.33	107.48	6	9	0/9
11	LRB081	107.00	79.33	91.00	130.00	167.00	106.67	94.33	88.67	127.33	110.15	23	9	0/9
12	LRB087	106.33	76.67	91.00	129.67	162.33	106.00	92.67	89.00	118.67	108.04	9	9	0/9
13	LRB099	107.00	80.33	94.00	***126.00***	163.33	107.00	97.00	86.67	121.33	109.19	17	9	1/9
14	LRB102	106.00	77.67	94.67	131.00	155.33	106.33	94.67	87.33	119.33	108.04	10	9	0/9
15	LRB107	104.00	76.33	91.33	134.67	165.00	107.00	90.67	88.33	123.00	108.93	16	9	0/9
16	LRB117	105.00	77.33	96.33	130.67	142.33	107.00	90.33	90.00	131.67	107.85	8	9	0/9
17	LRB118	103.00	76.67	92.00	131.00	162.67	105.00	89.33	85.00	123.00	107.52	7	9	0/9
18	LRB309	108.33	77.67	89.67	131.00	156.00	107.67	83.00	91.00	118.67	107.00	4	9	0/9
19	LRB334	107.00	78.00	91.00	126.67	165.00	105.00	84.67	90.00	112.67	106.67	3	9	0/9
20	LRB463	108.67	80.00	91.00	128.00	166.00	107.67	91.33	88.67	118.67	108.89	15	9	0/9
21	RBL-1 (C)	107.67	80.00	92.00	131.33	165.67	109.33	93.33	89.00	126.33	110.52	24	9	
22	RBL-6 (C)	105.00	77.33	96.33	**129.00**	**154.00**	108.00	97.33	87.33	122.33	108.52	14	9	
23	RBL-35 (C)	**102.33**	**77.00**	**91.00**	133.33	162.67	**105.33**	95.33	87.00	**118.67**	108.07	11	9	
24	RBL-50 (C)	107.00	80.00	96.67	130.00	162.00	106.33	**87.67**	**86.33**	130.00	109.56	20	9	
	Mean	**105.35**	**78.17**	**93.31**	**129.26**	**160.65**	**106.61**	**91.40**	**88.07**	**122.82**	**108.40**			
	CD (0.05)	**3.04**	**2.98**	**1.99**	**1.87**	**5.08**	**1.76**	**1.49**	**2.72**	**6.91**				
	CV (%) Error	**1.80**	**2.38**	**1.34**	**0.91**	**1.98**	**1.03**	**1.02**	**1.93**	**3.52**				

Table 68. 100 seed weight (g) in Initial Varietal Trial (IVT) on Rice bean : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bangalore	Bhubaneswar	Faizabad	Hisar	Ludhiana	Mettupalayam	Rahuri	Ranchi	Mean	Rank
	IVT											
1	LRB004	5.92	4.93	5.24	5.52	4.83	6.66	6.77	5.17	4.97	5.56	24
2	LRB018	5.92	5.03	6.13	5.23	6.47	7.45	6.77	5.10	5.40	5.94	6
3	LRB040-1	6.25	4.83	5.62	5.42	***6.73***	7.52	6.20	5.10	5.31	5.89	9
4	LRB046	5.47	4.67	5.55	4.97	***6.87***	7.70	6.67	5.10	5.35	5.82	16
5	LRB065	5.90	4.83	5.18	5.25	5.90	7.04	5.37	5.13	5.43	5.56	23
6	LRB068	6.28	4.53	6.15	5.08	6.37	7.48	6.67	5.10	5.58	5.92	7
7	LRB071-1	6.02	4.67	5.30	5.43	6.33	7.02	6.67	5.17	5.53	5.79	17
8	LRB071-2	6.22	5.00	5.37	5.57	6.67	7.31	6.13	5.17	5.52	5.88	10
9	LRB074-1	6.15	5.17	5.31	5.33	***7.17***	7.33	6.53	5.17	5.80	6.00	4
10	LRB080	6.17	4.87	5.43	5.57	***6.93***	7.78	***7.70***	5.10	5.63	6.13	2
11	LRB081	6.35	4.70	5.60	5.43	5.80	7.08	6.53	5.13	5.91	5.84	13
12	LRB087	6.40	5.03	5.67	5.05	6.50	7.91	6.83	5.17	5.46	6.00	3
13	LRB099	6.63	4.87	5.76	5.25	***7.43***	7.43	7.13	5.17	5.58	6.14	1
14	LRB102	6.68	4.47	5.47	4.93	6.07	7.26	6.87	5.07	5.67	5.83	15
15	LRB107	6.22	4.73	5.32	5.40	***6.73***	7.07	6.27	5.20	5.72	5.85	12
16	LRB117	6.95	4.93	5.55	5.18	***6.83***	7.35	5.87	5.17	6.08	5.99	5
17	LRB118	6.23	5.03	5.85	5.58	***6.80***	6.92	5.77	5.13	5.20	5.84	14
18	LRB309	6.15	4.53	5.61	5.37	6.10	7.52	6.37	5.07	5.27	5.78	18
19	LRB334	6.62	4.87	5.04	5.40	6.50	7.56	6.13	5.13	5.66	5.88	11
20	LRB463	6.02	4.93	5.64	4.93	4.90	7.35	7.23	5.17	5.53	5.75	21
21	RBL-1 (C)	5.83	4.87	5.51	**5.58**	**6.53**	7.15	6.03	5.17	5.28	5.77	19
22	RBL-6 (C)	6.08	4.90	**6.01**	5.18	6.37	7.12	5.40	5.10	5.59	5.75	20
23	RBL-35 (C)	6.08	4.70	5.59	5.42	5.73	**7.40**	**7.07**	**5.27**	**5.83**	5.90	8
24	RBL-50 (C)	**6.47**	**5.10**	5.55	5.17	6.47	6.92	5.50	**5.27**	5.23	5.74	22
	Mean	**6.21**	**4.84**	**5.56**	**5.30**	**6.38**	**7.31**	**6.44**	**5.15**	**5.52**	**5.86**	
	CD (0.05)	**0.75**	**0.41**	**0.81**	**0.35**	**0.16**	**0.56**	**0.10**	**0.22**	**0.53**		
	CV (%) Error	**7.56**	**5.34**	**9.07**	**4.09**	**1.59**	**4.78**	**0.98**	**2.65**	**6.02**		

Table 69. Performance of Faba bean entries in Initial Varietal Trial (IVT) during 2006 (Plains)

S. No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean grain yield over locations (q/ha)			Percent increase/ decrease over qualifying variety
				Mean	Location	Rank	
	IVT						
1	HB 603	141.22	25.06	16.99	5	5	-2.20
2	HB 604	139.33	25.30	16.92	5	6	-2.57
3	HB 608	140.44	28.04	19.25	5	1	10.80
4	HB 611	140.33	27.02	18.10	5	3	4.19
5	HB 613	141.50	28.12	18.66	5	2	7.40
6	NDF 1	141.94	25.73	16.51	5	7	-4.95
7	NDF 4	140.72	24.24	15.02	5	8	-13.53
8	IGSV 10-2	137.00	22.64	13.90	5	9	-20.00
9	Vikrant (C)	141.33	25.65	17.37	5	4	0.00
	Mean	**140.43**	**25.75**	**16.97**			

Table 70. Grain yield (q/ha) in Initial Varietal Trial (IVT) on Faba bean : 2006 (Plains)

S.No.	Genotypes	Delhi*	Ambikapur	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank	Location	Frequency
	IVT										
1	HB 603	8.86	4.54	16.56	39.09	9.24	15.51	16.99	5	5	0/5
2	HB 604	8.46	4.26	12.42	***45.49***	9.51	12.94	16.92	6	5	1/5
3	HB 608	6.91	4.10	20.47	***48.10***	7.16	16.40	19.25	1	5	1/5
4	HB 611	13.93	4.89	16.56	***46.80***	9.01	13.24	18.10	3	5	1/5
5	HB 613	9.59	4.82	17.25	***42.79***	10.94	***17.48***	18.66	2	5	2/5
6	NDF 1	10.86	3.98	20.16	31.68	***11.56***	15.16	16.51	7	5	1/5
7	NDF 4	8.06	3.40	17.02	34.57	7.52	12.59	15.02	8	5	0/5
8	IGSV 10-2	5.43	3.01	16.31	27.98	7.69	14.49	13.90	9	5	0/5
9	Vikrant (C)	6.47	5.12	20.93	36.20	9.66	14.93	17.37	4	5	
	Mean	**8.73**	**4.23**	**17.52**	**39.19**	**9.14**	**14.75**	**16.97**			
	CD (0.05)	**1.49**	**1.13**	**4.01**	**5.44**	**1.51**	**2.55**				
	CV (%) Error	**44.23**	**15.39**	**13.21**	**8.02**	**11.30**	**9.99**				

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

Table 71. Plant heigt (cm) in Initial Varietal Trial (IVT) on Faba bean : 2006 (Plains)

S.No.	Genotypes	Delhi	Ambikapur	Hisar	Faizabad	Ludhiana	Ranchi	Mean	Rank
	IVT								
1	HB 603	***82.07***	36.33	77.97	84.00	54.25	58.07	65.45	5
2	HB 604	***80.07***	38.93	64.07	***72.20***	53.25	64.60	62.19	6
3	HB 608	79.73	38.73	***84.67***	***86.03***	55.50	65.53	68.37	2
4	HB 611	***92.07***	40.47	64.07	82.33	56.00	65.60	66.76	4
5	HB 613	***89.13***	***43.67***	73.60	***87.60***	56.00	65.77	69.29	1
6	NDF 1	***88.27***	39.93	74.47	***84.33***	53.50	61.70	67.03	3
7	NDF 4	***80.67***	33.07	71.02	72.07	56.25	59.60	62.11	7
8	IGSV 10-2	***83.33***	32.13	62.87	77.73	48.50	57.90	60.41	9
9	Vikrant (C)	77.07	35.67	65.50	72.27	53.25	65.60	61.56	8
	Mean	**83.60**	**37.66**	**70.91**	**79.84**	**54.06**	**62.71**	**64.80**	
	CD (0.05)	**2.89**	**6.12**	**14.13**	**11.77**	**9.39**	**5.69**		
	CV (%) Error	**8.97**	**9.38**	**11.51**	**8.52**	**11.92**	**5.25**		

Table 72. Days to 50% flowering in Initial Varietal Trial (IVT) on Faba bean : 2006 (Plains)

S.No.	Genotypes	Delhi	Ambikapur	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank
	IVT								
1	HB 603	94.00	61.67	64.00	***70.67***	75.75	55.00	70.18	5
2	HB 604	***91.00***	62.67	***58.67***	***69.00***	76.00	56.33	68.94	2
3	HB 608	***91.67***	62.33	63.33	74.00	73.25	53.33	69.65	4
4	HB 611	95.00	65.33	***59.67***	***69.33***	73.25	***51.00***	68.93	1
5	HB 613	94.00	66.00	63.00	72.00	75.25	57.00	71.21	8
6	NDF 1	93.00	67.00	63.67	***65.00***	74.00	60.33	70.50	6
7	NDF 4	96.00	71.33	64.67	72.33	76.00	59.00	73.22	9
8	IGSV 10-2	94.00	64.67	***58.33***	72.33	73.25	53.67	69.38	3
9	Vikrant (C)	92.67	65.00	65.00	74.67	73.75	56.00	71.18	7
	Mean	**93.48**	**65.11**	**62.26**	**71.04**	**74.50**	**55.74**	**70.35**	
	CD (0.05)	**0.16**	**3.35**	**2.53**	**3.45**	**1.99**	**3.77**		
	CV (%) Error	**0.45**	**2.97**	**2.35**	**2.80**	**1.83**	**3.91**		

Table 73. Days to maturity in Initial Varietal Trial (IVT) on Faba bean : 2006 (Plains)

S.No.	Genotypes	Delhi	Ambikapur	Faizabad	Hisar	Ludhiana	Ranchi	Mean	Rank	Location	Frequency
	IVT										
1	HB 603	160.00	121.67	***135.67***	168.67	148.00	113.33	141.22	6	6	1/6
2	HB 604	157.33	119.67	***134.00***	165.33	148.00	111.67	139.33	2	6	1/6
3	HB 608	158.00	121.67	***131.00***	170.00	149.00	113.00	140.44	4	6	1/6
4	HB 611	163.33	118.67	***135.00***	164.67	150.00	110.33	140.33	3	6	1/6
5	HB 613	162.67	121.00	***135.33***	168.00	150.00	112.00	141.50	8	6	1/6
6	NDF 1	160.00	122.67	***138.67***	168.67	149.00	112.67	141.94	9	6	1/6
7	NDF 4	166.00	120.00	***130.33***	167.67	149.00	111.33	140.72	5	6	1/6
8	IGSV 10-2	161.00	***113.67***	***132.00***	166.00	148.00	***101.33***	137.00	1	6	2/6
9	Vikrant (C)	158.00	118.67	144.00	167.00	148.00	112.33	141.33	7	6	
	Mean	**160.70**	**119.74**	**135.11**	**167.33**	**148.78**	**110.89**	**140.43**			
	CD (0.05)	**0.56**	**2.27**	**2.45**	**4.25**	**-**	**4.93**				
	CV (%) Error	**0.91**	**1.10**	**1.05**	**1.47**	**-**	**2.57**				

Table 74. 100 seed weight (g) in Initial Varietal Trial (IVT) on Faba bean : 2006 (Plains)

S.No.	Genotypes	Delhi	Ambikapur	Hisar	Ludhiana	Ranchi	Mean	Rank
	IVT							
1	HB 603	22.83	24.00	***29.90***	21.05	27.53	25.06	7
2	HB 604	13.67	***26.98***	***31.10***	23.18	31.56	25.30	6
3	HB 608	***26.17***	***27.37***	***32.60***	22.20	***31.87***	28.04	2
4	HB 611	***27.83***	24.48	***31.50***	21.30	29.97	27.02	3
5	HB 613	***26.67***	***28.78***	28.80	***23.40***	***32.97***	28.12	1
6	NDF 1	23.33	24.58	28.10	22.50	30.11	25.73	4
7	NDF 4	23.33	22.52	27.80	20.18	27.35	24.24	8
8	IGSV 10-2	23.33	19.98	26.40	19.75	23.71	22.64	9
9	Vikrant (C)	24.00	25.32	28.20	21.15	29.60	25.65	5
	Mean	**23.46**	**24.89**	**29.38**	**21.63**	**29.41**	**25.75**	
	CD (0.05)	**1.25**	**0.35**	**0.45**	**2.14**	**2.26**		
	CV (%) Error	**13.86**	**0.80**	**0.88**	**6.80**	**4.44**		

Table 75. Pod yield (q/ha) in Initial Varietal Trial (IVT) on Faba bean : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Hisar	Ranchi	Mean	Rank
	IVT					
1	HB 603	23.70	191.67	40.74	85.37	5
2	HB 604	21.99	212.33	35.65	89.99	4
3	HB 608	23.10	***237.00***	***50.46***	103.52	1
4	HB 611	22.09	***228.33***	40.51	96.98	2
5	HB 613	20.69	***222.67***	37.36	93.57	3
6	NDF 1	18.05	160.00	41.67	73.24	8
7	NDF 4	19.16	178.33	41.67	79.72	7
8	IGSV 10-2	11.16	130.00	39.03	60.06	9
9	Vikrant (C)	22.69	191.67	40.97	85.11	6
	Mean	**20.29**	**194.67**	**40.90**	**85.28**	
	CD (0.05)	**5.54**	**25.65**	**7.00**		
	CV (%) Error	**15.76**	**7.61**	**9.88**		

Table 76. Performance of Winged bean entries in Initial and Advanced Varietal Trial (IVT & AVT) during 2006 (Plains)

S. No.	Genotypes	Mean maturity duration (days)	Mean 100 seed weight (g)	Mean grain yield over locations (q/ha)			Percent increase/decrease over qualifying variety
				Mean	Location	Rank	
	IVT						
1	EC021904	153.67	28.67	9.51	1	8	10.97
2	EC027885-1	152.67	28.00	6.56	1	21	-23.45
3	EC027886	155.00	27.00	9.51	1	9	10.93
4	EC116887	151.33	26.67	9.79	1	6	14.20
5	EC142654-4	147.00	26.00	7.91	1	15	-7.66
6	EC142662	107.00	27.00	8.81	1	12	2.84
7	EC142667	151.00	26.33	7.43	1	17	-13.34
8	IC045229-1	152.00	25.67	7.18	1	19	-16.18
9	IC095222	153.67	26.67	7.64	1	16	-10.89
10	IC095248	152.33	26.67	6.59	1	20	-23.10
11	NRBI-SEL	151.67	25.33	7.36	1	18	-14.16
	AVT-I						
12	Dwarf Mutant	161.92	28.02	10.06	3	5	17.39
13	EC038955	165.50	27.79	9.34	3	11	8.95
14	EC142665	163.92	29.88	11.92	3	1	39.04
15	EC178271	167.67	28.11	9.55	3	7	11.38
16	EC178313	166.42	28.69	11.47	3	2	33.81
17	EC178331	164.67	29.66	10.65	3	3	24.27
18	IC026945	164.67	29.75	10.64	3	4	24.13
19	Mysore Local	164.50	28.78	8.55	3	14	-0.29
20	NRBI-Sel	163.83	26.64	9.49	3	10	10.68
21	AKWB-1 (C)	166.58	26.91	8.57	3	13	0.00
	Mean	**164.33**	**28.21**	**9.81**			

Table 77. Grain yield (q/ha) in Initial and Advanced Varietal Trial (IVT & AVT) on Winged bean : 2006 (Plains)

S.No.	Genotypes	Bangalore*	Bhubaneswar	Rahuri	Ranchi	Mean	Rank	Location	Frequency
	IVT								
1	EC021904	-	-	9.51	-	9.51	8	1	0/1
2	EC027885-1	-	-	6.56	-	6.56	21	1	0/1
3	EC027886	-	-	9.51	-	9.51	9	1	0/1
4	EC116887	-	-	9.79	-	9.79	6	1	0/1
5	EC142654-4	-	-	7.91	-	7.91	15	1	0/1
6	EC142662	-	-	8.81	-	8.81	12	1	0/1
7	EC142667	-	-	7.43	-	7.43	17	1	0/1
8	IC045229-1	-	-	7.18	-	7.18	19	1	0/1
9	IC095222	-	-	7.64	-	7.64	16	1	0/1
10	IC095248	-	-	6.59	-	6.59	20	1	0/1
11	NRBI-SEL	-	-	7.36	-	7.36	18	1	0/1
	AVT-I								
12	Dwarf Mutant	2.47	10.42	10.06	***9.70***	10.06	5	3	1/3
13	EC038955	2.64	***12.15***	8.99	6.87	9.34	11	3	1/3
14	EC142665	2.01	***21.87***	8.57	5.30	11.92	1	3	1/3
15	EC178271	2.22	***13.54***	9.20	5.90	9.55	7	3	1/3
16	EC178313	1.45	***18.75***	8.99	6.67	11.47	2	3	1/3
17	EC178331	2.01	***16.32***	9.96	5.67	10.65	3	3	1/3
18	IC026945	2.15	***17.36***	8.95	5.60	10.64	4	3	1/3
19	Mysore Local	2.29	10.42	8.95	6.27	8.55	14	3	0/3
20	NRBI-Sel	1.93	***12.50***	9.02	6.93	9.49	10	3	1/3
21	AKWB-1 (C)	1.75	8.68	9.45	7.60	8.57	13	3	
	Mean	**2.09**	**14.20**	**8.59**	**6.65**	**9.81**			
	CD (0.05)	**1.27**	**2.11**	**0.86**	**0.92**				
	CV (%) Error	**35.27**	**8.68**	**6.23**	**8.05**				

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

Table 78. Days to 50% flowering in Initial and Advanced Varietal Trial (IVT & AVT) on Winged bean : 2006 (Plains)

S.No.	Genotypes	Bangalore	Rahuri	Ranchi	Mean	Rank
	IVT					
1	EC021904	-	55.67	-	55.67	4
2	EC027885-1	-	57.00	-	57.00	9
3	EC027886	-	57.67	-	57.67	11
4	EC116887	-	55.67	-	55.67	5
5	EC142654-4	-	***52.33***	-	52.33	1
6	EC142662	-	56.00	-	56.00	6
7	EC142667	-	55.33	-	55.33	2
8	IC045229-1	-	55.33	-	55.33	3
9	IC095222	-	57.00	-	57.00	10
10	IC095248	-	56.00	-	56.00	7
11	NRBI-SEL	-	56.00	-	56.00	8
	AVT-I					
12	Dwarf Mutant	***64.33***	55.33	71.00	63.56	15
13	EC038955	***63.00***	56.33	67.00	62.11	13
14	EC142665	73.33	58.00	68.33	66.56	21
15	EC178271	***63.00***	58.33	72.67	64.67	19
16	EC178313	***63.67***	59.00	71.33	64.67	20
17	EC178331	***64.00***	58.00	***62.67***	61.56	12
18	IC026945	***63.67***	57.67	71.00	64.11	17
19	Mysore Local	66.33	56.67	70.67	64.56	18
20	NRBI-Sel	66.67	57.00	***63.33***	62.33	14
21	AKWB-1 (C)	68.00	56.00	68.00	64.00	16
	Mean	**65.60**	**56.49**	**68.60**	**63.56**	
	CD (0.05)	**2.79**	**1.94**	**3.65**		
	CV (%) Error	**2.48**	**2.15**	**3.10**		

Table 79. Days to maturity in Initial and Advanced Varietal Trial (IVT & AVT) on Winged bean : 2006 (Plains)

S.No.	Genotypes	Bangalore	Bhubaneswar	Rahuri	Ranchi	Mean	Rank	Location	Frequency
	IVT								
1	EC021904	-	-	153.67	-	153.67	9	1	0/1
2	EC027885-1	-	-	152.67	-	152.67	8	1	0/1
3	EC027886	-	-	155.00	-	155.00	11	1	0/1
4	EC116887	-	-	151.33	-	151.33	4	1	0/1
5	EC142654-4	-	-	147.00	-	147.00	2	1	0/1
6	EC142662	-	-	***107.00***	-	107.00	1	1	1/1
7	EC142667	-	-	151.00	-	151.00	3	1	0/1
8	IC045229-1	-	-	152.00	-	152.00	6	1	0/1
9	IC095222	-	-	153.67	-	153.67	10	1	0/1
10	IC095248	-	-	152.33	-	152.33	7	1	0/1
11	NRBI-SEL	-	-	151.67	-	151.67	5	1	0/1
	AVT-I								
12	Dwarf Mutant	159.67	***159.33***	152.67	***176.00***	161.92	12	4	2/4
13	EC038955	156.33	171.33	154.33	***180.00***	165.50	18	4	1/4
14	EC142665	156.00	176.33	150.33	***173.00***	163.92	14	4	1/4
15	EC178271	155.67	172.67	154.33	188.00	167.67	21	4	0/4
16	EC178313	155.33	171.33	151.67	187.33	166.42	19	4	0/4
17	EC178331	156.33	173.33	154.00	***175.00***	164.67	16	4	1/4
18	IC026945	158.00	169.33	152.00	***179.33***	164.67	17	4	1/4
19	Mysore Local	155.67	***163.00***	153.00	186.33	164.50	15	4	1/4
20	NRBI-Sel	157.33	***163.67***	152.00	***182.33***	163.83	13	4	2/4
21	AKWB-1 (C)	157.00	169.00	153.67	186.67	166.58	20	4	
	Mean	**156.73**	**168.93**	**150.25**	**181.40**	**164.33**			
	CD (0.05)	**3.15**	**4.56**	**27.74**	**4.20**				
	CV (%) Error	**1.17**	**1.57**	**11.54**	**1.35**				

Table 80. 100 seed weight (g) in Initial and Advanced Varietal Trial (IVT & AVT) on Winged bean : 2006 (Plains)

S.No.	Genotypes	Bangalore	Bhubaneswar	Rahuri	Ranchi	Mean	Rank
	IVT						
1	EC021904	-	-	28.67	-	28.67	6
2	EC027885-1	-	-	28.00	-	28.00	9
3	EC027886	-	-	27.00	-	27.00	11
4	EC116887	-	-	26.67	-	26.67	14
5	EC142654-4	-	-	26.00	-	26.00	19
6	EC142662	-	-	27.00	-	27.00	12
7	EC142667	-	-	26.33	-	26.33	18
8	IC045229-1	-	-	25.67	-	25.67	20
9	IC095222	-	-	26.67	-	26.67	15
10	IC095248	-	-	26.67	-	26.67	16
11	NRBI-SEL	-	-	25.33	-	25.33	21
	AVT-I						
12	Dwarf Mutant	22.33	28.28	28.67	***32.80***	28.02	8
13	EC038955	22.70	28.29	29.00	31.17	27.79	10
14	EC142665	***23.40***	***33.71***	27.67	***34.73***	29.88	1
15	EC178271	22.30	27.95	28.00	***34.20***	28.11	7
16	EC178313	21.33	***31.14***	28.67	***33.60***	28.69	5
17	EC178331	***25.07***	***30.58***	28.67	***34.33***	29.66	3
18	IC026945	***23.47***	***30.77***	28.67	***36.10***	29.75	2
19	Mysore Local	21.23	27.35	29.33	***37.20***	28.78	4
20	NRBI-Sel	***24.00***	26.57	26.67	29.30	26.64	17
21	AKWB-1 (C)	20.97	29.03	28.00	29.63	26.91	13
	Mean	**22.68**	**29.37**	**27.49**	**33.31**	**28.21**	
	CD (0.05)	**2.05**	**0.82**	**2.26**	**1.87**		
	CV (%) Error	**5.27**	**1.62**	**5.14**	**3.28**		

Table 81. Green pod yield (q/ha) in Initial and Advanced Varietal Trial (IVT & AVT) on Winged bean : 2006 (Plains)

S.No.	Genotypes	Bangalore*	Bhubaneswar	Rahuri	Ranchi	Mean	Rank
	IVT						
1	EC021904	-	-	45.52	-	45.52	13
2	EC027885-1	-	-	***55.82***	-	55.82	5
3	EC027886	-	-	47.49	-	47.49	11
4	EC116887	-	-	46.17	-	46.17	12
5	EC142654-4	-	-	***59.95***	-	59.95	2
6	EC142662	-	-	50.47	-	50.47	8
7	EC142667	-	-	42.72	-	42.72	17
8	IC045229-1	-	-	44.43	-	44.43	16
9	IC095222	-	-	***58.53***	-	58.53	3
10	IC095248	-	-	***61.17***	-	61.17	1
11	NRBI-SEL	-	-	***56.42***	-	56.42	4
	AVT-I						
12	Dwarf Mutant	4.74	31.60	53.11	***42.97***	42.56	18
13	EC038955	4.76	39.93	***59.02***	36.97	45.30	14
14	EC142665	2.63	***68.40***	51.37	37.00	52.26	6
15	EC178271	3.79	39.93	54.16	40.50	44.86	15
16	EC178313	2.21	***62.85***	***58.91***	34.63	52.13	7
17	EC178331	4.53	***51.74***	***59.01***	37.50	49.42	10
18	IC026945	3.27	***63.89***	50.68	35.00	49.86	9
19	Mysore Local	3.75	38.54	49.99	31.53	40.02	21
20	NRBI-Sel	2.99	35.44	51.37	34.10	40.31	19
21	AKWB-1 (C)	2.11	33.68	50.05	37.00	40.24	20
	Mean	3.48	**46.60**	**52.68**	**36.72**	**45.33**	
	CD (0.05)	2.30	**7.14**	**5.61**	**4.83**		
	CV (%) Error	**38.56**	**8.93**	**6.66**	**7.67**		

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

Table 82. Performance of Kalingada entries in Initial Varietal Trial (IVT) during 2006 (Plains)

S. No.	Genotypes	Mean Numbr of fruits per plant	Mean seed yield over locations (q/ha)			Percent increase/ decrease over qualifying variety
			Mean	Location	Rank	
	IVT					
1	SKNK 102	3.75	8.03	2	15	73.40
2	SKNK 112	3.98	14.86	2	2	221.01
3	SKNK 136	4.70	9.38	2	11	102.57
4	SKNK 138	3.13	10.40	2	9	124.59
5	SKNK 140	3.82	10.52	2	7	127.15
6	SKNK 645	3.40	12.16	2	6	162.57
7	SKNK 648	3.68	6.30	2	17	36.00
8	SKNK 653	4.00	13.07	2	4	182.36
9	SKNK 659	1.85	7.32	2	16	58.11
10	SKNK 665	3.15	10.48	2	8	126.29
11	SKNK 674	2.61	9.16	2	12	97.82
12	SKNK 676	3.79	8.65	2	14	86.79
13	SKNK 678	2.93	12.19	2	5	163.17
14	SKNK 679	3.77	15.78	2	1	240.77
15	SKNK 680	2.50	9.68	2	10	109.01
16	SKNK 681	2.68	8.66	2	13	86.99
17	SKNK 683	2.47	14.62	2	3	215.75
18	GK 1 (C)	3.62	4.63	2	18	0.00
	Mean	**3.32**	**10.33**			

Table 83. Different characters of Kalingada entries in Initial Varietal Trial (IVT) at various location during 2006 (Plains)

S.No.	Genotypes	No. of fruits/plant			Fruit diameter (cm)			Seed yield (q/ha)			Rank	Location	Frequency
		Delhi	Mandor	Mean	Delhi	Mandor	Mean	Delhi	Mandor	Mean			
	IVT												
1	SKNK 102	1.93	5.57	3.75	***8.62***	8.77	8.69	***14.67***	***1.39***	8.03	15	2	2/2
2	SKNK 112	***2.42***	5.53	3.98	***8.56***	8.53	8.55	***28.89***	0.84	14.86	2	2	1/2
3	SKNK 136	***2.63***	**6.77**	4.70	7.73	9.33	8.53	***17.11***	***1.65***	9.38	11	2	2/2
4	SKNK 138	***2.60***	3.67	3.13	***8.23***	7.83	8.03	***19.67***	***1.13***	10.40	9	2	2/2
5	SKNK 140	2.20	5.43	3.82	***8.37***	8.03	8.20	***20.11***	0.92	10.52	7	2	1/2
6	SKNK 645	2.13	4.67	3.40	6.63	8.57	7.60	***23.11***	***1.20***	12.16	6	2	2/2
7	SKNK 648	1.93	5.43	3.68	6.55	8.83	7.69	11.33	***1.26***	6.30	17	2	1/2
8	SKNK 653	1.90	6.10	4.00	***8.59***	6.77	7.68	***25.33***	0.81	13.07	4	2	1/2
9	SKNK 659	1.47	2.23	1.85	***8.80***	8.77	8.79	***14.34***	0.30	7.32	16	2	1/2
10	SKNK 665	***3.50***	2.80	3.15	***8.08***	8.17	8.12	***20.34***	0.61	10.48	8	2	1/2
11	SKNK 674	2.12	3.10	2.61	6.76	7.57	7.16	***17.44***	0.87	9.16	12	2	1/2
12	SKNK 676	2.25	5.33	3.79	7.32	8.77	8.04	***16.33***	0.96	8.65	14	2	1/2
13	SKNK 678	2.10	3.77	2.93	***9.21***	10.07	9.64	***23.33***	***1.04***	12.19	5	2	2/2
14	SKNK 679	2.10	5.43	3.77	***9.03***	9.77	9.40	***30.22***	1.33	15.78	1	2	1/2
15	SKNK 680	1.53	3.47	2.50	***8.52***	8.40	8.46	***18.78***	0.58	9.68	10	2	1/2
16	SKNK 681	2.03	3.33	2.68	7.21	8.87	8.04	***16.89***	0.43	8.66	13	2	1/2
17	SKNK 683	***2.60***	2.33	2.47	***9.16***	7.60	8.38	***28.89***	0.35	14.62	3	2	1/2
18	GK 1 (C)	2.10	5.13	3.62	7.34	9.10	8.22	8.56	0.70	4.63	18	2	
	Mean	**2.20**	**4.45**	**3.32**	**8.04**	**8.54**	**8.29**	**19.74**	**0.91**	**10.33**			
	CD (0.05)	**0.28**	**1.60**		**0.45**	**1.31**		**3.56**	**0.29**				
	CV (%) Error	**30.68**	**22.48**		**13.57**	**9.58**		**43.24**	**19.75**				

Table 84. Different characters of Kalingada entries in Initial Varietal Trial (IVT) during 2006 at Delhi (Plains)

S.No.	Genotypes	Delhi					Mandor			
		Days to 50% flowering	Plant height (cm)	No. of branches per plant	Days to maturity	Fruit weight Total (Kg)	Days to fruit setting	Fruit yield (q/ha)	Single fruit weight (g)	100-seed weight (g)
	IVT									
1	SKNK 102	34.67	40.67	4.88	86.67	1.63	66.33	50.46	273.33	3.73
2	SKNK 112	33.00	40.67	4.20	82.00	3.87	67.00	53.70	289.67	4.41
3	SKNK 136	35.67	45.33	4.52	83.00	1.60	49.33	54.26	241.33	4.74
4	SKNK 138	35.67	41.33	4.85	87.67	1.70	62.67	33.35	272.67	3.88
5	SKNK 140	37.67	47.67	4.47	85.33	1.85	58.67	42.03	232.33	4.29
6	SKNK 645	32.00	39.00	4.92	89.00	4.93	42.00	40.37	260.67	4.14
7	SKNK 648	35.67	41.67	4.22	86.00	0.82	53.00	43.33	237.00	4.47
8	SKNK 653	37.33	46.33	4.75	84.33	2.57	52.67	39.76	196.67	3.76
9	SKNK 659	26.67	40.67	5.13	87.00	2.51	54.33	15.28	208.00	4.35
10	SKNK 665	33.67	41.00	5.20	92.00	2.15	49.67	17.24	186.67	2.90
11	SKNK 674	38.67	48.00	4.45	87.00	1.37	63.67	20.09	195.33	4.34
12	SKNK 676	38.67	46.67	4.60	85.00	1.37	42.67	41.29	232.00	3.16
13	SKNK 678	31.00	38.67	5.10	85.67	2.05	51.00	39.16	314.00	5.21
14	SKNK 679	35.00	41.67	5.25	85.33	2.67	57.00	51.29	281.00	4.24
15	SKNK 680	34.67	41.33	4.17	85.67	1.63	41.00	20.83	180.00	5.13
16	SKNK 681	35.33	41.00	3.92	86.00	1.25	50.33	18.52	166.33	3.91
17	SKNK 683	33.67	41.33	5.32	84.33	3.20	53.33	16.67	213.67	4.33
18	GK 1 (C)	34.33	39.67	5.52	81.33	0.80	43.33	35.51	208.33	3.99
	Mean	**34.63**	**42.37**	**4.75**	**85.74**	**2.11**	**53.22**	**35.17**	**232.72**	**4.17**
	CD (0.05)	**1.50**	**2.06**	**0.38**	**1.41**	**0.65**	**14.52**	**12.96**	**27.77**	**0.70**
	CV (%) Error	**10.42**	**11.66**	**19.02**	**3.96**	**73.49**	**17.05**	**23.02**	**7.46**	**10.47**

Table 85. Performance of Kankoda entries in Advanced Varietal Trial (AVT) during 2006 (Plains)

S. No.	Genotypes	Mean fruit setting (days)	Mean yield over locations (q/ha)			Percent increase/decrease over qualifying variety
			Mean	Location	Rank	
	AVT-I					
1	NDM 1	45.75	10.12	4	7	-25.04
2	Phule MD 05-1	47.17	11.42	4	4	-15.44
3	Phule MD 05-2	42.67	10.08	3	8	-25.32
4	RMF 1	50.80	10.64	5	6	-21.17
5	RMF 5-P-4	48.60	12.21	5	2	-9.55
6	RMF 7-P-1	50.07	9.69	5	9	-28.19
7	RMF 17	51.67	11.24	5	5	-16.77
8	RMF 27	49.87	11.64	5	3	-13.75
9	SKNKK 501	47.50	8.04	4	10	-40.47
10	RMF-37 (C)	47.20	13.50	5	1	0.00
	Mean	**49.44**	**10.78**			

Table 86. Fruit yield (q/ha) in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Rahuri	Ranchi	Mean	Rank	Location	Frequency
	AVT-I									
1	NDM 1	13.34	6.56	13.54	-	***7.03***	10.12	7	4	1/4
2	Phule MD 05-1	12.58	***15.73***	11.00	-	6.35	11.42	4	4	1/4
3	Phule MD 05-2	17.17	7.08	-	-	6.00	10.08	8	3	0/3
4	RMF 1	16.42	8.23	10.21	12.42	5.93	10.64	6	5	0/3
5	RMF 5-P-4	23.04	8.96	10.63	11.58	***6.84***	12.21	2	5	1/5
6	RMF 7-P-1	17.54	5.10	8.46	10.83	6.53	9.69	9	5	0/5
7	RMF 17	21.06	6.77	11.00	11.50	5.85	11.24	5	5	0/5
8	RMF 27	23.07	8.33	11.04	10.17	5.60	11.64	3	5	0/5
9	SKNKK 501	12.00	8.13	6.34	-	5.69	8.04	10	4	0/5
10	RMF-37 (C)	26.55	8.85	15.63	10.50	5.97	13.50	1	5	
	Mean	**17.36**	**8.32**	**10.87**	**11.17**	**6.18**	**10.78**			
	CD (0.05)	**5.92**	**1.79**	**3.03**	**-**	**0.78**				
	CV (%) Error	**18.89**	**12.50**	**16.12**	**-**	**7.33**				

Table 87. Days to fruit setting in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Rahuri	Ranchi	Mean	Rank
	AVT-I							
1	NDM 1	22.00	55.33	63.00	-	42.67	45.75	2
2	Phule MD 05-1	23.33	52.67	69.00	-	43.67	47.17	3
3	Phule MD 05-2	24.33	55.00	-	-	48.67	42.67	1
4	RMF 1	27.67	50.33	66.67	56.67	52.67	50.80	9
5	RMF 5-P-4	22.00	49.67	71.67	51.67	48.00	48.60	6
6	RMF 7-P-1	22.67	50.67	75.33	56.00	45.67	50.07	8
7	RMF 17	21.67	51.00	77.67	51.67	56.33	51.67	10
8	RMF 27	19.00	51.33	76.00	54.00	49.00	49.87	7
9	SKNKK 501	23.00	49.00	71.33	-	46.67	47.50	5
10	RMF-37 (C)	20.67	50.33	62.33	56.00	46.67	47.20	4
	Mean	**22.85**	**51.67**	**70.33**	**54.33**	**48.00**	**49.44**	
	CD (0.05)	**5.00**	**3.96**	**3.12**	**-**	**4.16**		
	CV (%) Error	**12.87**	**4.49**	**2.56**	**-**	**5.05**		

Table 88. No. of fruits per plant in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Rahuri	Ranchi	Mean	Rank
	AVT-I							
1	NDM 1	34.33	74.67	27.33	-	36.33	43.17	10
2	Phule MD 05-1	29.33	***125.97***	29.33	-	34.67	54.83	4
3	Phule MD 05-2	32.00	71.27	-	-	39.67	47.64	9
4	RMF 1	48.00	102.27	***35.00***	49.67	43.00	55.59	3
5	RMF 5-P-4	50.67	99.37	30.67	43.00	***44.33***	53.61	5
6	RMF 7-P-1	40.00	***134.80***	34.67	43.33	35.67	57.69	1
7	RMF 17	50.67	81.43	24.00	46.00	40.33	48.49	8
8	RMF 27	51.33	117.17	29.67	40.67	41.00	55.97	2
9	SKNKK 501	31.33	118.07	31.00	-	33.67	53.52	6
10	RMF-37 (C)	52.67	106.47	26.00	42.00	36.33	52.69	7
	Mean	**40.85**	**102.78**	**29.74**	**44.11**	**38.50**	**51.20**	
	CD (0.05)	**12.22**	**17.78**	**6.17**	**-**	**7.44**		
	CV (%) Error	**16.95**	**10.05**	**11.99**	**-**	**11.27**		

Table 89. Days taken to first picking in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Rahuri	Ranchi	Mean	Rank
	AVT-I							
1	NDM 1	46.00	71.67	73.00	-	47.33	59.50	3
2	Phule MD 05-1	47.00	65.00	79.33	-	45.33	59.17	2
3	Phule MD 05-2	46.67	70.33	-	-	50.33	55.78	1
4	RMF 1	49.67	64.33	77.00	77.00	47.00	63.00	7
5	RMF 5-P-4	42.67	***63.33***	81.00	72.67	50.67	62.07	6
6	RMF 7-P-1	44.00	64.33	84.67	77.67	49.00	63.93	8
7	RMF 17	48.67	64.00	87.33	72.67	53.00	65.13	9
8	RMF 27	44.33	64.33	86.00	74.67	60.00	65.87	10
9	SKNKK 501	47.00	***63.33***	81.00	-	54.33	61.42	4
10	RMF-37 (C)	46.33	65.67	72.33	77.00	47.00	61.67	5
	Mean	**46.22**	**65.63**	**80.19**	**75.28**	**50.40**	**63.54**	
	CD (0.05)	**7.15**	**1.95**	**2.90**	**-**	**7.01**		
	CV (%) Error	**9.01**	**1.73**	**2.09**	**-**	**8.11**		

Table 90. Days taken to last picking in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Rahuri	Ranchi	Mean	Rank
	AVT-I							
1	NDM 1	***68.00***	110.00	93.00	-	91.33	90.58	2
2	Phule MD 05-1	***65.33***	107.67	99.33	-	90.67	90.75	3
3	Phule MD 05-2	***68.33***	110.00	-	-	93.33	90.56	1
4	RMF 1	75.00	105.67	98.00	114.00	92.33	97.00	9
5	RMF 5-P-4	70.33	***103.00***	103.67	109.67	93.00	95.93	7
6	RMF 7-P-1	70.33	107.33	103.67	114.67	88.67	96.93	8
7	RMF 17	74.67	***102.67***	105.33	109.67	93.33	97.13	10
8	RMF 27	***67.00***	***103.33***	100.67	113.67	92.67	95.47	5
9	SKNKK 501	***67.67***	***104.33***	101.00	-	100.67	93.42	4
10	RMF-37 (C)	74.67	107.33	92.33	113.33	90.33	95.60	6
	Mean	**69.63**	**106.00**	**99.67**	**112.50**	**92.63**	**96.09**	
	CD (0.05)	**5.66**	**2.94**	**4.88**	**-**	**7.12**		
	CV (%) Error	**4.70**	**1.61**	**2.83**	**-**	**4.48**		

Table 91. Number of pickings in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Faizabad	Rahuri	Ranchi	Mean	Rank
	AVT-I							
1	NDM 1	1.90	7.33	2.67	-	***5.00***	4.23	6
2	Phule MD 05-1	1.93	8.00	2.67	-	***4.67***	4.32	5
3	Phule MD 05-2	2.20	7.33	-	-	4.00	4.51	2
4	RMF 1	1.60	9.00	3.00	4.00	4.33	4.39	4
5	RMF 5-P-4	2.43	7.67	3.00	3.33	4.33	4.15	7
6	RMF 7-P-1	2.67	***10.67***	3.00	3.67	4.33	4.87	1
7	RMF 17	2.53	6.67	3.00	3.67	3.67	3.91	9
8	RMF 27	2.30	9.00	2.33	4.00	4.33	4.39	3
9	SKNKK 501	1.73	7.00	2.33	-	3.33	3.60	10
10	RMF-37 (C)	2.67	8.33	2.33	4.00	3.33	4.13	8
	Mean	**2.14**	**8.07**	**2.70**	**3.78**	**4.13**	**4.17**	
	CD (0.05)	**0.79**	**1.23**	**1.15**	**-**	**1.28**		
	CV (%) Error	**20.86**	**8.83**	**24.53**	**-**	**18.09**		

Table 92. Single fruit weight (g) in Advanced Varietal Trial (AVT) on Kankoda : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Rahuri	Ranchi	Mean	Rank
	AVT-I						
1	NDM 1	7.82	6.90	-	***7.50***	7.41	9
2	Phule MD 05-1	8.59	***9.13***	-	***7.20***	8.31	6
3	Phule MD 05-2	10.75	5.76	-	6.63	7.72	8
4	RMF 1	6.93	6.67	11.27	***8.30***	8.29	7
5	RMF 5-P-4	9.30	6.09	11.90	***8.13***	8.86	1
6	RMF 7-P-1	8.40	5.95	10.90	***8.10***	8.34	5
7	RMF 17	8.34	***7.15***	10.53	***7.67***	8.42	4
8	RMF 27	8.99	***7.77***	10.27	7.00	8.51	3
9	SKNKK 501	7.66	6.11	-	7.03	6.94	10
10	RMF-37 (C)	11.02	6.07	10.73	6.27	8.52	2
	Mean	**8.53**	**6.84**	**10.93**	**7.38**	**8.42**	
	CD (0.05)	**2.11**	**0.78**	-	**0.93**		
	CV (%) Error	**14.04**	**6.69**	-	**7.32**		

Table 93. Performance of Tumba entries in Initial Varietal Trial (IVT) during 2006 (Plains) - Mandor

S. No.	Genotypes	Mean 100 seed weight (g)	Mean seed yield over locations (q/ha)			Percent increase/decrease over qualifying variety
			Mean	Location	Rank	
	IVT					
1	RMT 401	2.50	0.83	1	11	-27.54
2	RMT 402	2.57	0.72	1	13	-37.39
3	RMT 403	2.39	1.68	1	2	46.38
4	RMT 404	2.39	1.43	1	3	24.06
5	RMT 405	2.75	0.98	1	10	-14.78
6	RMT 406	2.10	1.09	1	9	-4.93
7	RMT 407	2.37	1.76	1	1	53.04
8	RMT 408	2.28	0.78	1	12	-32.46
9	RMT 409	2.63	0.48	1	15	-58.26
10	RMT 501	2.26	0.60	1	14	-48.12
11	RMT 502	2.62	1.24	1	7	7.83
12	RMT 509	2.30	1.37	1	4	19.13
13	RMT 515	3.15	1.30	1	5	12.75
14	RMT 516	2.07	1.24	1	6	8.12
15	RMT 59 (C)	2.30	1.15	1	8	0.00
	Mean	**2.45**	**1.11**			

Table 94. Different characters of Tumba entries in Initial Varietal Triaal (IVT) during 2006 at Mandor (Plains)

S.No.	Genotypes	Fruit yeild (q/ha)	Number of fruits per plant	Single fruit weight (g)	Fruit circumference (cm)	100-seed weight (g)	Seed yield (q/ha)	Rank
	IVT							
1	RMT 401	9.33	3.23	87.00	19.73	2.50	0.83	11
2	RMT 402	12.13	3.57	102.67	22.00	2.57	0.72	13
3	RMT 403	33.06	6.23	160.00	22.43	2.39	1.68	2
4	RMT 404	24.63	7.10	103.67	23.10	2.39	1.43	3
5	RMT 405	17.78	4.33	123.00	23.03	2.75	0.98	10
6	RMT 406	19.63	5.90	99.33	25.40	2.10	1.09	9
7	RMT 407	26.85	5.53	144.67	27.93	2.37	1.76	1
8	RMT 408	21.11	4.23	150.00	22.67	2.28	0.78	12
9	RMT 409	11.39	3.00	114.67	20.80	2.63	0.48	15
10	RMT 501	13.89	3.23	129.00	23.57	2.26	0.60	14
11	RMT 502	22.78	6.20	109.67	21.50	2.62	1.24	7
12	RMT 509	21.48	6.10	106.00	24.10	2.30	1.37	4
13	RMT 515	26.57	5.10	156.33	21.70	3.15	1.30	5
14	RMT 516	25.65	4.87	157.67	24.83	2.07	1.24	6
15	RMT 59 (C)	23.89	4.90	146.67	23.43	2.30	1.15	8
	Mean	**20.68**	**4.90**	**126.02**	**23.08**	**2.45**	**1.11**	
	CD (0.05)	**4.96**	**1.11**	**12.50**	**3.34**	**0.41**	**0.26**	
	CV (%) Error	**14.33**	**13.52**	**5.93**	**8.66**	**9.99**	**13.88**	

Table 95. Performance of Jatropha entries in Initial Varietal Trial (IVT) during 2006 (Plains)

S. No.	Genotypes	Mean 100 seed weight (g)	Mean seed yield over locations (q/ha)			Percent increase/decrease over Trial mean
			Mean	Location	Rank	
1	Chhatrapati	59.97	8.10	4	2	38.47
2	Hansraj	57.28	5.83	4	5	-0.29
3	ISJ 1	54.50	4.02	4	6	-31.32
4	JH 1	54.94	10.28	3	1	75.75
5	Phule 1	48.71	3.20	3	7	-45.27
6	SK Nagar (Big)	56.37	6.61	4	3	13.06
7	SKNJ 4	50.14	2.88	3	8	-50.85
8	Urlikanchan	55.81	6.48	4	4	10.75
	Mean	**56.41**	**5.85**			

Table 96. Seed yield (q/ha) in Initial Varietal Trial (IVT) on Jatropha : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Hisar	S.K. Nagar	Mean	Rank	Location
1	Chhatrapati	7.26	3.54	20.72	0.88	8.10	2	4
2	Hansraj	2.13	2.83	17.31	1.07	5.83	5	4
3	ISJ 1	6.90	2.32	5.78	1.07	4.02	6	4
4	JH 1	-	2.51	27.50	0.83	10.28	1	3
5	Phule 1	-	2.25	6.55	0.81	3.20	7	3
6	SK Nagar (Big)	2.78	2.76	19.83	1.09	6.61	3	4
7	SKNJ 4	-	2.65	5.09	0.88	2.88	8	3
8	Urlikanchan	4.13	2.77	18.13	0.90	6.48	4	4
	Mean	4.64	**2.70**	**15.11**	0.94	**5.85**		
	CD (0.05)	0.84	**0.21**	**0.57**	0.11			
	CV (%) Error	**11.70**	**4.34**	**2.57**	**6.51**			

Table 97. Plant height (cm) in Initial Varietal Trial (IVT) on Jatropha : 2006 (Plains)

S.No.	Genotypes	Bhubaneswar	S.K. Nagar	Mean	Rank
1	Chhatrapati	219.00	226.10	222.55	1
2	Hansraj	177.00	222.30	199.65	7
3	ISJ 1	190.67	225.03	207.85	4
4	JH 1	182.00	219.67	200.83	6
5	Phule 1	182.67	222.33	202.50	5
6	SK Nagar (Big)	174.33	223.00	198.67	8
7	SKNJ 4	193.67	226.63	210.15	3
8	Urlikanchan	194.67	225.67	210.17	2
	Mean	**189.25**	**223.84**	**206.55**	
	CD (0.05)	**8.65**	**16.51**		
	CV (%) Error	**2.60**	**4.20**		

Table 98. No. of primary branches per plant in Initial Varietal Trial (IVT) on Jatropha : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Hisar	S.K. Nagar	Mean	Rank
1	Chhatrapati	5.90	13.67	23.25	5.57	12.10	2
2	Hansraj	5.53	13.33	9.75	5.20	8.45	8
3	ISJ 1	4.43	14.00	10.25	5.50	8.54	7
4	JH 1	-	14.33	27.25	6.20	15.93	1
5	Phule 1	-	12.33	8.25	5.53	8.71	6
6	SK Nagar (Big)	5.65	12.67	21.00	5.77	11.27	3
7	SKNJ 4	-	14.00	12.00	5.47	10.49	4
8	Urlikanchan	5.73	12.00	14.75	5.73	9.55	5
	Mean	**5.45**	**13.29**	**15.81**	**5.62**	**10.04**	
	CD (0.05)	**1.62**	**1.05**	**3.00**	**0.60**		
	CV (%) Error	**19.26**	**4.50**	**12.90**	**6.10**		

Table 99. 100 seed weight (g) in Initial Varietal Trial (IVT) on Jatropha : 2006 (Plains)

S.No.	Genotypes	Ambikapur	Bhubaneswar	Hisar	S.K. Nagar	Mean	Rank
1	Chhatrapati	69.68	70.50	55.50	44.22	59.97	1
2	Hansraj	69.35	67.70	50.60	41.48	57.28	2
3	ISJ 1	70.38	61.10	45.60	40.91	54.50	6
4	JH 1	-	63.70	60.70	40.43	54.94	5
5	Phule 1	-	61.40	45.38	39.35	48.71	8
6	SK Nagar (Big)	67.48	62.87	54.60	40.55	56.37	3
7	SKNJ 4	-	63.73	45.55	41.13	50.14	7
8	Urlikanchan	69.80	63.07	54.15	36.22	55.81	4
	Mean	**69.34**	**64.26**	**51.51**	**40.54**	**56.41**	
	CD (0.05)	**3.35**	**1.66**	**1.27**	**7.33**		
	CV (%) Error	**3.13**	**1.47**	**1.68**	**10.31**		

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 HPKVV, 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 lines for all the characters have been presented in table 100 and the range and means in table 101.

At GBPUA&T, Ranichauri a set of 50 genotypes including four checks were evaluated for 10 characters. The longest inflorescence (75.00 cm) was recorded in the genotype IC 467898 followed by IC 540817 (72.60 cm). IC 519562 (39.00 days) was earliest in flowering and IC 467886 (100.00 days) in maturity. The maximum plant height (178.83 cm) was observed in the genotype EC 519539 followed by IC 540887 (178.50 cm). The genotype IC 467912 was observed as the highest yielder with 75.18 g seed yield per plant followed by IC467901 (72.05 g).

A total of 50 genotypes were also evaluated at CSK HPKVV, Palampur for six characters only. IC 447676 (48 days) was earliest in flowering as well as in maturity (83.00 days). Maximum plant height (122.00 cm) was observed in the genotype IC 967912 and IC 540864 followed by IC 540887 (113.00 cm). The genotype IC 447680 was observed as the highest yielder followed by IC 467910. IC 467911 genotype was found to have maximum number of primary branches.

A set of 54 genotypes including checks were screened at NBPGR, Shimla for ten quantitative characters and 12 qualitative (Table 102) and the genotypes, EC 519562 (57 days) was found superior to the check variety for days to 50% flowering. Maximum plant height (364.15 cm) was recorded in the genotype, EC 519539. The longest inflorescence (87.60 cm) was recorded in the genotype, IC 540902 followed by IC 467911 (82.70 cm). IC 467910 (107.53 g) and IC 540862 (105.11 g) genotypes were found superior to the check variety in respect of seed yield per plant.

Flowering time was the earliest at Palampur (52.23 days) followed by at Ranichauri centre (63.83), while it was moderately late at Shimla (84.31 days). No entry showed early maturity with respect to the checks based on the average over all the 3 locations.

Based on the average over locations, IC 540839 and IC 340860 (84.55 g) were the highest yielding lines followed by IC 467910 (78.08 g).

Based on the average over three locations, EC-519539 had the highest plant height (213.99 cm).

3.1.2 BUCKWHEAT (*Fagopyrum* spp.)

A set of 50 accessions were to be screened at four locations viz. NBPGR, Shimla; GBPUA&T, Ranichauri, CSK HPKVV, Palampur and Almora along with four checks Himpriya, VL 7, PRB 1 and Shimla B-1. The results were received from three locations only. The list of promising accessions for all the characters have been presented in table 103 and mean and range in table 104.

A set of 54 genotypes including checks Himpriya, PRB 1, Shimla B-1 and VL-7 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, maturity and seed yield per plant. Maximum height (175.16) was recorded in the genotype IC 017571 while maximum number of branches (3.16) was observed in the genotype IC 024299.

A set of 54 genotypes including checks was screened for 13 yield related attributes at Almora. No entry was found superior to the check variety for days to flowering, maturity and 100 seed weight. The genotype IC 108499 was recorded as the highest yielder with 11.20 g seed yield per plant followed by IC 107989 with seed yield of 10.64 g per plant.

The maximum plant height (161.00 cm) was recorded in the genotype IC 016562 followed by IC 018040 (153.0 cm).

At NBPGR, Shimla a set of 50 accessions were evaluated for thirteen quantitative characters along with four national checks Himpriya, PRB 1, Shimla B-1 and VL-7. The genotype IC 423441 was observed as the early flowering type (45 days) but no entry was found to be early maturing type (Table 105). This set of 50 accessions was also evaluated for 11 qualitative triats (Table 106).

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

Significant difference was observed among the entries for seed yield per plant at the two locations. Mean seed yield per plant was high at Ranichauri (41.59 g) but very low at Almora (4.33 g). Based on the average over locations, the entry EC 125938 (40.00 g) was the highest yielding accession.

Average plant height of the entries was the highest at Ranichauri (134.42 cm) followed by at Almora (115.36 cm). Based on average over two locations, IC 017971 had the highest plant height (163.58 cm).

Flowering time varied from centre to centre but mean flowering time was the earliest at Almora (39.01 days) followed by at Ranichauri (52.49 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 Almora (78.37 days) followed by at

Ranichauri (113.05 days). On the basis of average over the locations, no accession was found superior to the best check variety.

The average plant height was higher at Ranichauri (134.42 cm) as compared to that at Almora (115.30 cm). On the basis of average over the locations, IC 017971 (103.58 cm) possessed the highest plant height followed by IC 016562 (156.83 cm).

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 lines for all the characters have been presented in table 107 and mean and range in table 108.

Twenty five genotypes along with three local checks were evaluated for eight qualitative (Table 109) and ten quantitative characters at Shimla. The early flowering (74 days) and early maturity (139 days) were observed in the genotype EC 507741. Highest inflorescence length (47.60 cm) was recorded in the genotype NIC 22517 followed by IC 540837 (46.75 cm). The genotype NIC 22506 and EC 507733 was recorded as the top yielding lines as well as having highest test weight (1.40 g). Genotype NIC 22503 was the tallest entry (314.31 cm).

A total of twenty five genotypes were evaluated for six yield related characters at GBPU&T, Ranichauri. The genotypes IC 415493 was found superior to the check varieties for early flowering (43 days) and early maturity (90 days). Maximum plant height (148.25 cm) was found in the genotype IC 341707 followed by IC 341696 (148.00 days). The longest inflorescence length (41.25 cm) were observed in the genotype IC 341707. Highest seed yield per plant was recorded (30.68 g) in the genotype IC 258332 followed by IC 341707 (30.60 g).

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

Significant difference was observed among the entries for seed yield per plant at the two locations. Mean seed yield per plant was high at Shimla (26.95 g) but slightly low at Ranichauri (21.50 g). Based on the average over locations, the entry NIC 022506 (36.22 g) was the highest yielding accessions.

The average plant height of the entries was the highest at Shimla (257.29 cm) followed by at Ranichauri (111.21 cm). Based on the average over two locations, IC341696 had the highest plant height (227.54 cm).

Flowering time varied from centre to centre but mean flowering time was the earliest at Ranichauri (62.34 days) followed by at Shimla (92.81 days). On the basis of average over two locations no accession was found superior to the best check.

The longest inflorescence length was observed at Shimla (41.88 cm) followed by at Ranichauri (27.76 cm). On the basis of average over two locations the genotype IC 341696 (43.24 cm) was found to have longest inflorescence length.

3.1.4 ADZUKI BEAN (*Vigna angularis*)

A set 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. Data have been received from only two locations. The list of promising accessions for all the characters have been presented in table 110 and mean and range in table 111.

At Ranichauri twenty five accessions including exotics were evaluated along with check HPU 51 for eight yield related characters. Genotype EC 000248 was recorded as early flowering and EC 341949 as early maturing type with 45 days and 112 days, respectively. IC 341952 was found to be the highest seed yielder per plant (42.50 g) followed by genotype EC 340267 (41.84 g). The longest pod was observed in the genotype IC 341953 (10.00 cm) followed by IC341952 (9.50 cm). The maximum plant height (80.60 cm) was found in the genotypes EC 087895 and EC 340267 followed by EC 341961 (78.00 cm).

A total of 25 genotypes were evaluated along with check HPAU 51 in an Augmented Design at NBPGR, Shimla for qualitative and quantitative characters. The tallest plant height (97.00 cm) was found in the genotype IC 341949. Early flowering (48 days) was recorded in the genotype, EC 340240 whereas early maturity (103 days) was recorded in the genotype EC 240254 followed by IC341949 (105). Maximum number of pods per plant (35.00) was found in the genotype, EC 469173 followed by IC 341953 (32.60) was observed as the highest seed yielder (32.01 g/plant).

The performance of the entries based on two centres (Shimla and Ranichauri) has been given below as:

Flowering time varied from 48 to 66 days at Shimla and from 45.00 to 62.00 days at Ranichauri. Mean flowering time was the earliest at Ranichauri (54.31 days) followed by at Shimla (58.18 days). On the basis of average over two locations, entry EC 341961 was the earliest in flowering (47.00 days).

Average maturity period was the earliest at Ranichauri (121.64) and longest at Shimla (106.86 days). Genoptype EC 341961 was superior to the check based on average of two locations.

Average plant height was recorded to be the highest at Shimla (62.97 cm) followed by at Ranichauri (61.58 cm). Based on average over two locations, entry IC 341949 was the tallest (81.40 cm) entry.

Average seed yield per plant was recorded to be the highest at Ranichauri (30.78 g) followed by at Shimla (19.74 g). The details of qualitative characters recorded at Shimla have been presented in table 112.

Based on average over two locations, the entry EC 340244 was highest yielder (33.71 g/plant).

3.1.5 BHANGJIRA (*Perilla frutescense*)

A set of 20 genotypes were planned to be evaluated at four locations viz. NBPGR, Shillong, Palampur, Shimla and GBPUA&T, Ranichauri. Results have been received from two centres. The list of promising accessions for all the

characters has been presented in table 113 and mean and range for Ranichauri and Bhowali centres in table 114.

At GBPUA&T, Ranichauri, a set of 20 genotypes were evaluated for five yield contributing characters. The genotypes, SS 491 and SSAKM 122 were found early flowering as well as early maturing type. SS 359 was observed as the highest seed yielder followed by SS 570. Maximum plant height (166.80 cm) was recorded in the genotype SS 539 followed by Local check.

A total of 20 genotypes including checks were evaluated for quantitative and qualitative characters (Table 115) at Bhowali centre. No entry was found earlier in maturity to the local check. The maximum plant height (211.00 cm) was observed in genotype RS-12 followed by IC 003865 (205.00 cm). The highest seed yield per plant was recorded in the genotype IC 006440 (10.0 g) followed by H-529 (8.6 g).

The performance of the entries based on two centres (Ranichauri and Bhowali) has been given below:

Flowering time varied from 79 to 68 days at Ranichauri and from 105 to 140 days at Bhowali. The mean flowering time was the earliest at Ranichauri (88.50 days) followed by at Bhowali (132.00 days). On the basis of average over two locations, the entry SSAKM 22 was the earliest in flowering (97.00 days).

Average maturity period showed similar trend as for flowering. The genotype (SS 539) was superior to the check based on average over two locations.

Average plant height was recorded to be the highest at Ranichauri (109.25 cm) followed by at Bhowali. The genotype SS 359 was superior to the check based on average over the two locations. The average 100 seed weight was recorded to be similar at both the locations. Based on average over two locations, the genotype SS 359 was found to be bold seeded (1.60 g).

Table 100. Promising lines in Grain Amaranth 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 50% flowering	57.00-96.80	EC519562, EC519541 (< 70.0 days)	Durga (72.60 days)
2.	Days to maturity	140.80-162.00	No Accessions	Durga 140.80 days)
3.	Plant height (cm)	177.15-364.15	EC519539, IC447682, IC540867, IC467892, IC540809, IC467898 (> 315.0 cm)	PRA2 (310.92 cm)
4.	Inflorescence length (cm)	52.75-87.60	IC540902, IC467911, IC467894, IC467892 (> 78.75 cm)	PRA2 (74.88 cm)
5.	Leaf length (cm)	17.20-29.50	IC540860, IC467912, IC467894, IC540862, IC467897, EC519562, IC467911 (> 24.95 cm)	Durga (23.79 cm)
6.	Petiole length (cm)	11.90-20.15	IC467890, IC467908, IC467891 (> 18.90 cm)	Durga (18.74 cm)
7.	Stem thickness (cm)	2.08-3.64	IC467888, IC467910, IC540867, IC467890, IC467911 (> 3.19 cm)	PRA2 (2.99 cm)
8.	Seed yield per plant (g)	30.32-107.53	IC467910, IC540862, IC467890 (> 99.10 g)	Annapurna (92.03 g)
9.	100 seed weight (g)	0.50-0.80	No Accessions	Durga (0.80 g)
Ranichauri (Accessions 50)				
1.	Days to 50% flowering	39.00-90.00	EC519562, EC519536, EC519541, IC467886, IC467888, IC467892, IC467912, IC540876 (< 50.0 days)	IC35407 (52.67 days)
2.	Days to maturity	100.00-143.00	IC467886, EC519562, EC519541, IC467888, IC540876, IC447680 (< 107.0 days)	IC35407 (106.00 days)
3.	Plant height (cm)	84.50-178.83	EC519539, IC540887, IC467898, IC467912, EC519541, IC467911 (> 166.33 cm)	PRA 2 (164.16 cm)
4.	Inflorescence length (cm)	42.16-75.00	IC467898, IC540817, IC467910, IC467897 (> 65.66 cm)	PRA 2 (62.88 cm)
5.	No. of finger per plant	17.00-43.66	IC467886, IC467898 (> 40.83)	PRA 2 (40.55)
6.	Finger length (cm)	6.00-15.70	IC467912, IC467901, IC540872, EC519541, IC540817, IC467911, IC467897 (> 11.80 cm)	PRA 2 (11.05 cm)

7.	No. of leaves per plant	15.33-40.83	IC447676, IC467912, IC467897, IC467898, IC540902, IC540839 (> 31.00)	Annapurna (28.55)
8.	Leaf length (cm)	8.00-16.00	IC467912, EC519541, IC540832 (> 14.66 cm)	Annapurna (14.16 cm)
9.	Leaf width (cm)	3.33-8.33	EC519541, IC447677, IC447676, IC467912, IC467894, IC467911, IC447680 (> 6.80 cm)	PRA 2 (6.50 cm)
10.	Seed yield per plant (g)	30.00-75.18	IC467912, IC467901, IC467893, IC540839, IC540860, IC540902, IC540888 (> 62.40 g)	PRA 2 (58.27 g)
Palampur (Accessions 50)				
1.	Days to 50% flowering	48.0-62.0	IC-447676, IC-467884, IC-467888, IC-467890, IC-467892, IC-467901, IC-519562, IC-540815, IC-540860, IC-540876 (< 49.0 days)	IC-35407 Durga (48.00 days)
2.	Days to maturity	83.0-105.0	IC-447676, IC-447682, IC-467884, IC-467886 (< 84.0 days)	IC-35407 Durga (84.50 days)
3.	Plant height (cm)	72.0-122.0	IC-967912, IC-540864, IC-540887, IC-467911, IC-540867, IC-540817, IC-467910, IC-540862, IC-767894, IC-540888, IC-540860, IC-540805 (> 107.0 cm)	PRA-3 (98.50 cm)
4.	Inflorescence length (cm)	15.0-51.0	IC-467911, EC-519536, IC-467910 (> 43.0 cm)	Annapurna (41.50 cm)
5.	Seed yield (kg/plot)	0.01-0.16	IC-447680, IC-467910 (> 0.14 kg/plot)	Annapurna (0.19 kg/plot)
Best entries over locations				
1.	Days to 50% flowering	48.00-82.93	EC519562, EC519541 (<57.67 days)	IC-35407 Durga (57.76 days)
2.	Plant height (cm)	111.22-221.66	EC519539, IC467898, IC467894, IC540867, IC540887, IC467912 (>192.10 cm)	PRA-2 (190.19 cm)
3.	Days to maturity	107.93-136.67	No accessions	IC-35407 Durga (110.43 days)
4.	Seed yield /plant (g)	30.16-91.36	IC540839, IC540860, IC467910, IC467901, IC540862 (>74.80 g)	Annapurna (74.71 g)
5.	Inflorescence length (cm)	47.46-81.30	IC467898, IC467911, IC467910 (> 70.66 cm)	PRA-2 (68.88 cm)

Table 101. Multilocational evaluation of germplasm lines in grain amaranth at Shimla, Ranichauri and Palampur - Hills (2006)

S.No.	Accession No.	Days to 50% flowering				Plant height (cm)				Day to maturity			
		Palampur	Shimla	Ranichauri	Mean	Palampur	Shimla	Ranichauri	Mean	Palampur	Shimla	Ranichauri	Mean
1	EC519536	51	74	49	58.00	79.00	288.40	133.16	166.85	88	160	108	118.67
2	EC519539	51	91	70	70.67	99.00	364.15	178.83	213.99	87	157	131	125.00
3	EC519541	53	69	49	57.00	105.00	248.35	172.83	175.39	86	157	106	116.33
4	EC519562	48	57	39	48.00	105.00	177.15	84.50	122.22	88	156	101	115.00
5	IC447676	48	79	70	65.67	82.00	282.75	166.16	176.97	83	159	130	124.00
6	IC447677	53	82	66	67.00	99.00	270.35	158.16	175.84	85	159	118	120.67
7	IC447680	51	83	60	64.67	107.00	304.20	142.00	184.40	85	159	106	116.67
8	IC447682	62	94	64	73.33	100.00	331.45	141.50	190.98	83	158	117	119.33
9	IC467884	48	93	80	73.67	99.00	291.45	164.50	184.98	83	159	136	126.00
10	IC467886	53	77	49	59.67	95.00	248.35	148.50	163.95	83	157	100	113.33
11	IC467888	48	81	49	59.33	88.00	268.45	158.00	171.48	85	156	106	115.67
12	IC467890	48	78	59	61.67	103.00	282.35	119.50	168.28	85	158	111	118.00
13	IC467891	51	82	59	64.00	72.00	281.85	152.16	168.67	88	159	112	119.67
14	IC467892	48	76	49	57.67	76.00	326.85	141.50	181.45	85	157	107	116.33
15	IC467893	53	84	65	67.33	82.00	297.70	157.33	179.01	88	159	118	121.67
16	IC467894	51	93	80	74.67	109.00	315.00	158.83	194.28	95	156	136	129.00
17	IC467897	52	75	75	67.33	99.00	294.45	140.66	178.04	85	157	132	124.67
18	IC467898	55	82	80	72.33	97.00	317.15	176.66	196.94	86	162	136	128.00
19	IC467899	52	89	59	66.67	103.00	295.85	123.83	174.23	88	159	110	119.00
20	IC467900	51	83	54	62.67	87.00	258.00	132.33	159.11	86	157	110	117.67
21	IC467901	48	81	59	62.67	96.00	294.60	142.66	177.75	88	158	112	119.33
22	IC467908	53	76	54	61.00	104.00	276.75	125.00	168.58	88	158	111	119.00
23	IC467910	53	81	65	66.33	110.00	305.00	152.00	189.00	88	158	116	120.67
24	IC467911	53	83	60	65.33	113.00	280.30	168.33	187.21	88	159	108	118.33
25	IC467912	51	75	49	58.33	122.00	282.90	174.33	193.08	99	156	108	121.00
26	IC540805	55	84	65	68.00	108.00	289.10	145.33	180.81	95	159	116	123.33
27	IC540807	51	83	59	64.33	102.00	274.95	156.83	177.93	95	158	116	123.00
28	IC540809	55	89	85	76.33	104.00	318.15	154.16	192.10	88	154	140	127.33
29	IC540815	48	83	64	65.00	100.00	282.35	139.84	174.06	92	157	115	121.33
30	IC540817	54	82	54	63.33	111.00	287.35	166.33	188.23	95	158	111	121.33

Table 101. Multilocational e

S.No.	Accession No.	Seed yield /plant (g)			Inflorescence length (cm)			Shimla				
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Leaf length (cm)	Petiole length (cm)	Stem thickness (cm)	Lateral stricIclet length (cm)	100 seed weight (g)
1	EC519536	39.63	44.85	42.24	65.80	50.33	58.07	20.40	11.90	2.76	3.90	0.60
2	EC519539	57.60	59.80	58.70	63.95	50.50	57.23	23.65	13.40	2.78	22.35	0.80
3	EC519541	42.82	38.80	40.81	61.30	52.50	56.90	22.30	17.20	2.24	10.80	0.60
4	EC519562	30.32	36.12	33.22	56.50	45.00	50.75	25.65	16.85	2.30	13.25	0.70
5	IC447676	63.76	38.40	51.08	66.70	44.50	55.60	21.35	12.00	2.63	11.95	0.60
6	IC447677	59.13	36.10	47.62	71.30	57.16	64.23	22.35	12.40	2.27	17.05	0.70
7	IC447680	55.95	40.05	48.00	66.35	46.00	56.18	22.85	15.80	2.65	8.90	0.60
8	IC447682	91.41	46.10	68.76	62.50	45.16	53.83	21.05	18.65	3.16	8.65	0.60
9	IC467884	54.93	58.00	56.47	69.10	59.50	64.30	23.00	15.45	2.55	13.65	0.70
10	IC467886	70.52	30.00	50.26	69.35	54.16	61.76	24.95	15.65	2.31	16.25	0.70
11	IC467888	48.30	38.60	43.45	64.45	45.33	54.89	23.45	18.90	3.64	7.75	0.70
12	IC467890	101.10	48.50	74.80	71.90	49.00	60.45	23.50	20.15	3.26	8.80	0.60
13	IC467891	52.04	39.75	45.90	70.45	43.50	56.98	23.45	18.95	2.60	8.35	0.60
14	IC467892	62.22	38.40	50.31	78.85	42.16	60.51	23.85	16.25	2.58	22.10	0.70
15	IC467893	70.80	72.00	71.40	63.80	65.66	64.73	20.15	15.15	2.79	7.00	0.70
16	IC467894	60.50	40.25	50.38	82.90	50.00	66.45	27.65	14.35	2.95	15.00	0.70
17	IC467897	90.78	47.05	68.92	70.75	67.00	68.88	26.80	14.35	2.63	13.15	0.70
18	IC467898	56.65	50.00	53.33	77.40	75.00	76.20	22.55	13.35	2.69	11.35	0.70
19	IC467899	50.77	42.00	46.39	73.80	42.50	58.15	20.65	17.80	2.78	17.65	0.60
20	IC467900	60.99	48.50	54.75	64.65	55.33	59.99	24.15	17.85	2.90	31.60	0.70
21	IC467901	80.23	72.05	76.14	71.70	50.83	61.27	23.35	16.00	2.33	13.20	0.50
22	IC467908	66.70	40.12	53.41	67.15	46.33	56.74	24.65	18.95	2.75	9.40	0.60
23	IC467910	107.53	48.62	78.08	78.75	67.50	73.13	19.90	13.50	3.47	13.35	0.60
24	IC467911	60.11	50.00	55.06	85.70	61.66	73.68	25.25	17.00	3.21	21.75	0.60
25	IC467912	71.81	75.18	73.50	73.70	63.66	68.68	28.15	16.05	2.77	9.80	0.60
26	IC540805	57.63	45.00	51.32	62.15	61.83	61.99	22.30	14.75	2.89	13.20	0.60
27	IC540807	60.40	54.10	57.25	62.70	55.50	59.10	22.85	17.75	2.36	11.25	0.60
28	IC540809	72.75	60.00	66.38	73.10	55.50	64.30	20.10	15.55	2.65	9.95	0.70
29	IC540815	57.22	46.10	51.66	64.75	47.66	56.21	21.75	18.05	2.86	10.15	0.70
30	IC540817	52.55	52.38	52.47	68.65	72.66	70.66	21.00	14.30	2.08	14.15	0.60

Table 101. Multilocational e

S.No.	Accession No.	Ranichauri					Palampur		
		No. of finger /plant	Finger length (cm)	No. of leaves /plant	Length of leaf (cm)	Width of leaf (cm)	Seed yield/plot (kg)	Inflorescence length(cm)	Number of primary branches
1	EC519536	32.50	9.50	20.66	11.16	5.50	0.11	51.00	1.00
2	EC519539	26.00	8.50	24.00	12.16	5.66	0.01	43.00	1.00
3	EC519541	37.83	12.00	26.50	15.83	8.33	0.12	40.00	1.00
4	EC519562	17.00	10.66	15.33	10.33	4.66	0.14	43.00	1.00
5	IC447676	32.66	11.00	40.83	14.66	7.16	0.10	32.00	1.00
6	IC447677	30.16	11.00	23.83	14.16	7.83	0.12	35.00	1.00
7	IC447680	34.66	10.25	31.00	12.50	6.83	0.16	21.00	1.00
8	IC447682	30.50	7.66	21.16	8.00	5.00	0.11	24.00	1.00
9	IC467884	38.33	11.50	28.00	13.33	6.50	0.07	24.00	1.00
10	IC467886	43.66	11.00	24.66	11.00	4.50	0.01	22.00	1.00
11	IC467888	32.00	9.80	30.00	11.83	5.66	0.07	34.00	1.00
12	IC467890	37.00	9.66	20.66	8.33	3.50	0.01	26.00	1.00
13	IC467891	38.00	8.70	26.66	11.66	6.00	0.03	25.00	1.00
14	IC467892	32.83	9.50	25.50	11.33	6.50	0.05	26.00	1.00
15	IC467893	37.00	11.50	29.83	13.60	6.80	0.02	29.00	1.00
16	IC467894	33.00	10.00	24.50	13.66	6.83	0.01	24.00	1.00
17	IC467897	30.66	12.00	36.50	12.50	6.00	0.03	31.00	1.00
18	IC467898	41.33	11.35	35.00	12.33	6.16	0.08	31.00	1.00
19	IC467899	30.66	10.00	23.50	12.00	5.33	0.01	21.00	1.00
20	IC467900	28.33	11.00	30.83	12.00	6.66	0.03	25.00	1.00
21	IC467901	40.83	12.75	26.50	11.16	6.16	0.05	27.00	1.00
22	IC467908	29.50	11.00	19.50	13.16	5.83	0.05	37.00	1.00
23	IC467910	31.83	11.60	26.00	12.16	6.33	0.16	46.00	1.00
24	IC467911	32.66	12.00	26.33	13.15	6.83	0.14	51.00	1.00
25	IC467912	32.66	15.70	40.00	16.00	6.83	0.02	33.00	1.00
26	IC540805	38.33	11.80	23.66	10.66	5.33	0.07	40.00	1.00
27	IC540807	38.00	6.77	29.00	8.83	5.33	0.05	28.00	1.00
28	IC540809	30.00	11.00	25.50	12.66	5.33	0.09	40.00	1.00
29	IC540815	30.83	7.66	24.33	9.00	4.50	0.09	32.00	1.00
30	IC540817	36.83	12.00	26.00	10.00	6.50	0.06	35.00	1.00

S.No.	Accession No.	Days to 50% flowering				Plant height (cm)				Day to maturity			
		Palampur	Shimla	Ranichauri	Mean	Palampur	Shimla	Ranichauri	Mean	Palampur	Shimla	Ranichauri	Mean
31	IC540821	53	81	54	62.67	90.00	314.70	156.66	187.12	95	154	110	119.67
32	IC540825	54	92	85	77.00	103.00	314.50	149.33	188.94	95	158	141	131.33
33	IC540832	53	83	90	75.33	94.00	307.75	164.33	188.69	95	156	143	131.33
34	IC540839	51	85	60	65.33	97.00	292.55	157.33	182.29	99	158	116	124.33
35	IC540842	54	84	85	74.33	105.00	296.80	164.66	188.82	99	160	140	133.00
36	IC540843	55	93	70	72.67	96.00	310.60	153.50	186.70	99	158	120	125.67
37	IC540845	51	92	59	67.33	96.00	307.45	143.33	182.26	100	152	111	121.00
38	IC540849	52	91	65	69.33	97.00	262.15	140.83	166.66	101	158	116	125.00
39	IC540860	48	91	72	70.33	108.00	282.40	158.50	182.97	101	149	132	127.33
40	IC540862	53	93	75	73.67	110.00	279.30	154.33	181.21	104	158	124	128.67
41	IC540864	59	81	70	70.00	122.00	306.95	138.33	189.09	104	159	120	127.67
42	IC540867	51	90	55	65.33	112.00	329.30	139.66	193.65	105	158	113	125.33
43	IC540872	53	85	65	67.67	101.00	300.55	166.16	189.24	103	159	116	126.00
44	IC540874	55	84	59	66.00	101.00	259.15	155.66	171.94	98	158	114	123.33
45	IC540876	48	82	49	59.67	103.00	267.35	149.83	173.39	101	160	106	122.33
46	IC540879	52	91	64	69.00	100.00	299.25	157.66	185.64	101	157	116	124.67
47	IC540887	51	81	59	63.67	113.00	288.25	178.50	193.25	98	159	114	123.67
48	IC540888	52	91	65	69.33	109.00	299.16	158.83	189.00	100	158	116	124.67
49	IC540901	53	93	54	66.67	101.00	311.20	150.16	187.45	101	154	112	122.33
50	IC540902	59	90	65	71.33	103.00	282.25	153.66	179.64	95	159	121	125.00
Means for check varieties													
	Annapurna (C)	60.50	95.20	70.00	75.23	80.50	292.53	162.38	178.47	87.00	159.00	125.67	123.89
	IC-35407 (C) Durga	48.00	72.60	52.67	57.76	96.00	256.17	144.00	165.39	84.50	140.80	106.00	110.43
	PRA-2 (C)	50.00	96.20	75.00	73.73	95.50	310.92	164.16	190.19	99.00	157.40	132.00	129.47
	PRA-3 (C)	57.00	96.80	80.00	77.93	98.50	308.37	152.77	186.55	100.00	158.00	135.00	131.00
	Minimum	**48.00**	**57.00**	**39.00**	**48.00**	**72.00**	**177.15**	**84.50**	**111.22**	**83.00**	**140.80**	**100.00**	**107.93**
	Maximum	**62.00**	**96.80**	**90.00**	**82.93**	**122.00**	**364.15**	**178.83**	**221.66**	**105.00**	**162.00**	**143.00**	**136.67**
	Mean	**52.23**	**84.31**	**63.83**	**66.79**	**99.77**	**291.02**	**150.77**	**180.52**	**92.64**	**157.28**	**118.29**	**122.74**
	CD (0.05%)	**-**	**17.91**	**-**	**-**	**-**	**52.83**	**-**	**-**	**-**	**6.37**	**-**	**-**
	CV (%) Error	**-**	**7.44**	**-**	**-**	**-**	**6.78**	**-**	**-**	**-**	**1.55**	**-**	**-**
	CV (%) Phenotypic	**6.19**	**9.07**	**17.74**	**9.19**	**10.38**	**9.37**	**10.84**	**7.14**	**7.46**	**1.96**	**9.53**	**3.95**

S.No.	Accession No.	Seed yield /plant (g)			Inflorescence length (cm)			Shimla				
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Leaf length (cm)	Petiole length (cm)	Stem thickness (cm)	Lateral stricliclet length (cm)	100 seed weight (g)
31	IC540821	51.00	48.40	49.70	70.30	61.33	65.82	24.70	14.50	3.09	13.25	0.60
32	IC540825	43.48	45.00	44.24	70.45	57.66	64.06	23.25	14.65	2.83	15.15	0.70
33	IC540832	48.89	49.08	48.99	73.85	54.50	64.18	23.35	15.35	2.86	8.30	0.60
34	IC540839	99.10	70.00	84.55	70.05	49.00	59.53	20.75	11.95	2.69	11.95	0.70
35	IC540842	99.04	50.00	74.52	74.60	62.83	68.72	23.20	13.45	2.74	11.25	0.70
36	IC540843	60.24	54.00	57.12	69.50	52.00	60.75	19.30	15.50	2.94	16.15	0.60
37	IC540845	53.52	40.44	46.98	71.50	56.83	64.17	24.60	15.75	2.73	6.65	0.60
38	IC540849	61.75	52.40	57.08	52.75	50.00	51.38	20.85	17.80	2.27	13.10	0.80
39	IC540860	99.10	70.00	84.55	63.75	51.00	57.38	29.50	18.00	3.05	15.25	0.70
40	IC540862	105.11	46.33	75.72	65.30	53.33	59.32	26.95	16.75	2.83	13.35	0.70
41	IC540864	74.20	60.12	67.16	76.35	46.00	61.18	20.95	15.55	2.51	5.80	0.70
42	IC540867	69.66	40.00	54.83	64.80	43.83	54.32	21.55	15.65	3.39	8.90	0.70
43	IC540872	55.63	38.40	47.02	77.15	58.33	67.74	23.90	17.30	3.19	19.30	0.80
44	IC540874	73.81	33.40	53.61	66.25	56.33	61.29	22.40	12.35	2.62	14.45	0.60
45	IC540876	44.61	45.87	45.24	72.60	49.16	60.88	17.20	15.20	2.69	11.75	0.70
46	IC540879	68.66	62.40	65.53	63.10	49.33	56.22	22.05	14.00	3.05	10.90	0.70
47	IC540887	69.13	46.50	57.82	68.70	63.16	65.93	22.15	17.60	3.01	15.20	0.70
48	IC540888	78.42	68.10	73.26	71.05	50.50	60.78	22.65	15.85	2.63	14.70	0.70
49	IC540901	55.05	38.40	46.73	73.15	59.33	66.24	22.25	13.35	2.77	15.85	0.70
50	IC540902	50.48	68.40	59.44	87.60	50.00	68.80	23.60	18.75	2.97	14.00	0.80
Means for check varieties												
	Annapurna (C)	92.03	57.38	74.71	70.07	61.05	65.56	23.09	13.95	2.73	12.93	0.60
	IC-35407 (C) Durga	77.88	42.79	60.33	63.18	54.94	59.06	23.79	18.74	2.80	6.40	0.80
	PRA-2 (C)	86.89	58.27	72.58	74.88	62.88	68.88	22.00	13.90	2.99	15.23	0.70
	PRA-3 (C)	70.37	45.20	57.79	68.31	51.94	60.13	21.51	13.93	2.79	15.15	0.70
	Minimum	**30.32**	**30.00**	**30.16**	**52.75**	**42.16**	**47.46**	**17.20**	**11.90**	**2.08**	**3.90**	**0.50**
	Maximum	**107.53**	**75.18**	**91.36**	**87.60**	**75.00**	**81.30**	**29.50**	**20.15**	**3.64**	**31.60**	**0.80**
	Mean	**66.58**	**49.41**	**57.99**	**69.62**	**54.54**	**62.08**	**22.94**	**15.71**	**2.78**	**12.98**	**0.67**
	CD (0.05%)	**40.64**	**-**	**-**	**12.96**	**-**	**-**	**5.37**	**3.84**	**0.86**	**6.07**	**-**
	CV (%) Error	**18.61**	**-**	**-**	**7.03**	**-**	**-**	**8.90**	**9.51**	**11.35**	**18.30**	**-**
	CV (%) Phenotypic	**27.08**	**22.39**	**20.89**	**9.43**	**14.25**	**9.06**	**9.86**	**13.34**	**11.36**	**36.58**	**10.09**

S.No.	Accession No.	Ranichauri					Palampur		
		No. of finger /plant	Finger length (cm)	No. of leaves /plant	Length of leaf (cm)	Width of leaf (cm)	Seed yield/plot (kg)	Inflorescence length(cm)	Number of primary branches
31	IC540821	23.83	11.00	29.00	13.00	6.00	0.03	21.00	1.00
32	IC540825	34.66	11.00	27.33	12.83	5.16	0.05	24.00	1.00
33	IC540832	37.66	9.75	21.66	15.16	6.16	0.05	20.00	1.00
34	IC540839	34.00	10.00	31.16	10.50	6.33	0.04	26.00	1.00
35	IC540842	34.66	10.00	24.66	10.66	5.33	0.03	21.00	1.00
36	IC540843	27.33	9.50	26.83	10.00	4.50	0.02	29.00	1.00
37	IC540845	34.00	10.66	24.33	11.83	6.00	0.05	15.00	1.00
38	IC540849	32.50	8.75	23.33	9.33	5.00	0.02	19.00	1.00
39	IC540860	40.00	10.00	25.00	11.15	5.33	0.03	21.00	1.00
40	IC540862	29.16	10.66	25.16	10.83	5.50	0.04	21.00	1.00
41	IC540864	23.66	10.00	25.33	9.83	4.83	0.02	27.00	1.00
42	IC540867	28.50	6.00	24.00	8.00	3.33	0.05	28.00	1.00
43	IC540872	33.83	12.34	25.50	12.00	4.33	0.05	41.00	1.00
44	IC540874	32.66	10.50	27.16	12.33	6.00	0.03	29.00	1.00
45	IC540876	35.50	9.78	25.00	11.83	6.66	0.05	30.00	1.00
46	IC540879	30.16	9.75	21.83	10.83	5.16	0.04	29.00	1.00
47	IC540887	36.33	9.50	20.50	13.66	6.33	0.07	32.00	1.00
48	IC540888	24.66	10.65	27.83	11.50	5.33	0.07	26.00	1.00
49	IC540901	39.50	8.66	29.83	11.50	5.50	0.03	33.00	1.00
50	IC540902	38.83	11.65	31.83	12.00	6.00	0.01	26.00	1.00
Means for check varieties									
	Annapurna (C)	36.33	10.77	28.55	14.16	6.16	0.13	41.50	1.00
	IC-35407 (C) Durga	30.44	9.17	23.61	11.72	5.11	0.10	34.00	1.00
	PRA-2 (C)	40.55	11.05	27.89	13.33	6.50	0.05	27.00	1.00
	PRA-3 (C)	37.78	10.22	25.03	12.33	5.61	0.06	29.00	1.00
	Minimum	**17.00**	**6.00**	**15.33**	**8.00**	**3.33**	**0.01**	**15.00**	**1.00**
	Maximum	**43.66**	**15.70**	**40.83**	**16.00**	**8.33**	**0.16**	**51.00**	**1.00**
	Mean	**33.41**	**10.44**	**26.66**	**11.85**	**5.80**	**0.06**	**30.10**	**1.00**
	CD (0.05%)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	CV (%) Error	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	CV (%) Phenotypic	**15.29**	**14.84**	**17.45**	**15.24**	**16.41**	**71.73**	**27.00**	**0.00**

Table 102. Characterization of germplasm lines in grain amaranth at Shimla - Hills (2006)

S.No.	Accession No.	Early Plant Vigour	Growth habit	Leaf colour	Inflore scence colour	Inflore-scence compact-ness	Stem colour	Stem surface	Infllore-scence shape	Inflore-scence spininess	Seed shatt-ering	Seed trans-parancy	Seed colour
1	EC519536	3	1	5	2	5	1	2	4	4	3	2	1
2	EC519539	3	1	5	9	5	5	2	4	4	3	2	1
3	EC519541	3	1	5	6	5	1	2	4	2	3	2	1
4	EC519562	3	1	5	6	5	1	2	4	4	3	2	1
5	IC447676	3	1	5	6	5	1	2	4	4	3	2	1
6	IC447677	3	1	5	11	5	1	2	4	4	3	2	1
7	IC447680	3	1	5	11	5	1	2	4	4	3	2	1
8	IC447682	3	1	5	6	5	1	2	4	2	3	2	1
9	IC467884	3	1	5	6	5	4	2	4	2	3	2	1
10	IC467886	3	1	5	3	5	1	2	4	4	3	2	1
11	IC467888	3	1	5	3	5	1	2	4	2	3	2	1
12	IC467890	3	1	5	3	5	1	2	4	4	3	2	1
13	IC467891	3	1	5	3	5	1	2	4	4	3	2	1
14	IC467892	3	1	5	9	5	4	2	4	4	3	2	1
15	IC467893	3	1	5	6	5	1	2	4	4	3	2	1
16	IC467894	3	1	5	6	5	4	2	4	4	3	2	1
17	IC467897	3	1	5	6	5	4	2	4	4	3	2	1
18	IC467898	3	1	5	11	5	1	2	4	4	3	2	1
19	IC467899	3	1	5	11	5	1	2	4	4	3	2	1
20	IC467900	3	1	5	11	5	2	2	4	4	3	2	1
21	IC467901	3	1	5	3	5	1	2	4	4	3	2	1
22	IC467908	3	1	5	11	5	1	2	4	4	3	2	1
23	IC467910	3	1	5	11	5	2	2	4	4	3	2	1
24	IC467911	3	1	5	11	5	1	2	4	4	3	2	1
25	IC467912	3	1	5	9	5	5	2	4	4	7	2	8
26	IC540805	3	1	5	6	5	1	2	4	2	3	2	1
27	IC540807	3	1	5	6	5	1	2	4	2	3	2	1
28	IC540809	3	1	5	6	5	4	2	4	2	3	2	1
29	IC540815	3	1	5	6	5	4	2	4	2	3	2	1
30	IC540817	3	1	5	6	5	4	2	4	2	3	2	1
31	IC540821	3	1	5	6	5	4	2	4	2	3	2	1

S.No.	Accession No.	Early Plant Vigour	Growth habit	Leaf colour	Inflore scence colour	Inflore-scence compact-ness	Stem colour	Stem surface	Infllore-scence shape	Inflore-scence spininess	Seed shatt-ering	Seed trans-parancy	Seed colour
32	IC540825	3	1	5	6	5	4	2	4	2	3	2	1
33	IC540832	3	1	5	6	5	4	2	4	4	3	2	1
34	IC540839	3	1	5	6	5	4	2	4	2	3	2	1
35	IC540842	3	1	5	6	5	4	2	4	4	3	2	1
36	IC540843	3	1	5	6	5	4	2	4	2	3	2	1
37	IC540845	3	1	5	6	5	4	2	4	4	3	2	1
38	IC540849	3	1	5	6	5	4	2	4	4	3	2	1
39	IC540860	3	1	5	11	5	1	2	4	2	3	2	1
40	IC540862	3	1	5	11	5	1	2	4	2	3	2	1
41	IC540864	3	1	5	6	5	4	2	4	7	3	2	1
42	IC540867	3	1	5	6	5	4	2	4	4	3	2	1
43	IC540872	3	1	5	6	5	4	2	4	4	3	2	1
44	IC540874	3	1	5	6	5	4	2	4	4	3	2	1
45	IC540876	3	1	5	6	5	2	2	4	4	3	2	1
46	IC540879	3	1	5	11	5	1	2	4	2	3	2	1
47	IC540887	3	1	5	6	5	4	2	4	4	3	2	1
48	IC540888	3	1	5	6	5	4	2	4	2	3	2	1
49	IC540901	3	1	5	6	5	4	2	4	2	3	2	1
50	IC540902	3	1	5	6	5	4	2	4	4	3	2	1
Means for check varieties													
	Annapurna (C)	3	1	5	11	5	1	2	4	2	3	2	1
	IC-35407 (C) Durga	3	1	5	6	5	2	2	4	2	5.4	2	1
	PRA-2 (C)	3	1	5	11	5	1	2	4	4	3	2	1
	PRA-3 (C)	3	1	5	11	5	1	2	4	4	3	1.8	1
	Minimum	**3**	**1**	**5**	**2**	**5**	**1**	**2**	**4**	**2**	**3**	**1.8**	**1**
	Maximum	**3**	**1**	**5**	**11**	**5**	**5**	**2**	**4**	**7**	**7**	**2**	**8**

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 spininess: 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 103. Promising lines in Buckwheat germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Almora (Accessions 50)				
1.	Days to 50% flowering	21.0-49.0	No accession	VL Ugal 7 (21.00 days)
2.	Days to maturity	53.0-89.0	No accession	VL Ugal 7 (53.00 days)
3.	Plant height (cm)	81.60-161.00	IC016562, IC018040, IC017971, IC016559, IC017379 (> 142.0 cm)	PRB-1 (134.80 cm)
4.	No. of primary branches per plant	5.0-10.0	IC107610, IC037291, IC107116, IC094679, IC107564, IC094662 (> 9.00)	Himpriya (8.20)
5.	No. of leaves per plant	58.6-289.0	IC107564, IC107610, IC107627, IC107960, IC107575, IC108500, IC108495, IC107293, IC107585, IC024297, IC108499, IC107208, IC094662, IC108496, IC018751, IC107974 (> 248.00)	Himpriya (214.60)
6.	Leaf length (cm)	3.0-7.0	IC016559, IC017372, IC016562, IC037291, IC024297, IC017379, IC108500 (> 5.50 cm)	VL Ugal 7 (5.02 cm)
7.	Leaf width (cm)	2.80-5.70	IC037291, IC108495, IC108500, IC107293, IC024297, IC107995, IC386668, IC107610 (> 5.00 cm)	Himpriya (4.58 cm)
8.	Petiole length (cm)	1-5.70	IC108496, IC108495, IC037291, IC107293, IC107968, IC049160, IC047458, IC107995 (> 4.10 cm)	Himpriya (3.16 cm)
9.	No. of nodes per plant	11.60-23.00	IC108496, IC108503, IC107585, IC108495, IC108499, IC107974, IC107564, IC107989, IC094663, IC107575, IC107208 (> 21.0)	Himpriya (20.40)
10.	No. of inflorescence per plant	61.40-264.0	IC107564, IC107610, IC108500, IC107627, IC107208, IC107585, IC107575 (> 229.0)	PRB-1 (188.60)
11.	100 seed weight (g)	1.10-2.96	No accessions	VL Ugal 7 (2.96 g)
12.	Yield per plant (g)	0.44-11.20	IC108499, IC107989, IC108500 (> 9.82 g)	Shimla B-1 (7.10 g)
Ranichauri (Accessions 50)				
1.	Days to 50% flowering	30.00-74.67	No. accession	VL 7 (30.00 days)
2.	Days to maturity	84.00-122.00	No. accession	VL 7 (84.00 days)

3.	Plant height (cm)	105.85-175.16	IC017971, IC024299 (> 165.83 cm)	SHIMLA B1 (156.82 cm)
4.	No. of primary branches per plant	1.66-3.16	IC024299 (> 2.89)	SHIMLA B1 (2.89)
5.	No. of leaves per plant	13.66-27.83	IC107968, IC018751, IC017372, IC107627, IC018040 (> 22.0)	SHIMLA B1 (21.27)
6.	Seed yield/plant (g)	25.00-60.70	No. accession	VL 7 (60.70 g)
Shimla (Accessions 50)				
1.	Days to 50% flowering	45.0-77.0	IC423441, KP/05/119 (< 45.40 days)	VL-7 45.40
2.	Days to maturity	85.0-143.40	No accession	Shimla B1 85.00
3.	Plant height (cm)	70.70-1777.70	IC540857, IC447576, IC447692 (> 196.75 cm)	Shimla B1 181.94
4.	Leaf length (cm)	2.25-9.45	IC547548, EC213682, IC362260 (> 8.30 cm)	Himpriya 7.07
5.	Leaf width (cm)	2.45-9.30	IC360826, IC381098, IC547549, IC547346 (> 8.85 cm)	Himpriya 7.25
6.	Petiole length (cm)	1.25-7.20	IC547346, IC540858, IC361359, IC360826, IC547315, IC547398, IC547549, IC362260 (> 5.50 cm)	Himpriya 4.06
7.	No. of primary branches per plant	2.0-7.0	IC547549, IC547360 (> 7.00)	Himpriya 7.00
8.	100 seed weight (g)	11.10-24.00	IC540858, EC213682, IC447691, IC360829, IC547373, IC447694, IC447695, IC447692, IC447689, IC540852, IC447693, IC447690, IC540853, IC540855, IC540857, IC547310, IC547548 (> 19.60 g)	Himpriya 17.06
Best entries over locations				
1.	Plant height (cm)	93.72-168.08	IC017971, IC016562, IC017379, IC016559, IC024299 (>145.80 cm)	PRB-1 (142.70cm)
2.	Number of primary branches	3.33-6.58	IC094679, IC107116, IC107610, IC012664, IC037291, IC107564, IC094662 (>5.67)	Himpriya (5.38)
3.	Number of leaves per plant	36.13-158.42	IC107627, IC107610, IC107564, IC107575, IC107960, IC108500 (>144.00)	PRB-1 (117.13)

4.	Days to 50% flowering	25.50-61.83	No accession	VL Ugal 7 (25.50 days)
5.	Days to maturity	68.50-105.50	No accession	VL Ugal 7 (68.50 days)
6.	Yield per plant (g)	12.72-35.95	EC125938 (>38.00 g)	VL Ugal 7 (32.74 g)

Table 104. Multilocational evaluation of germplam lines in Buckwheat at Almora and Ranichauri - Hills (2006)

S.No.	Accessions	Plant height (cm)			Number of primary branches			Number of leaves per plant			Days to 50% flowering			Days to maturity		
		Almora	Ranichauri	Mean	Almora	Ranichauri	Mean	Almora	Ranichauri	Mean	Almora	Ranichauri	Mean	Almora	Ranichauri	Mean
1	EC125938	-	118.00	118.00	-	2.16	2.16	-	14.00	14.00	-	35.00	35.00	-	100.00	100.00
2	EC216627	96.00	148.33	122.17	6.00	2.00	4.00	77.00	15.16	46.08	23.00	36.00	29.50	61.00	102.00	81.50
3	EC323731	123.00	139.66	131.33	6.00	2.16	4.08	83.00	14.33	48.67	24.00	38.00	31.00	66.00	105.00	85.50
4	IC012664	105.00	144.85	124.93	9.00	2.83	5.92	179.00	16.66	97.83	38.00	38.00	38.00	78.00	105.00	91.50
5	IC016555	131.00	145.83	138.42	7.00	2.66	4.83	121.00	18.66	69.83	24.00	42.00	33.00	65.00	110.00	87.50
6	IC016559	146.00	159.33	152.67	6.00	2.16	4.08	110.00	19.66	64.83	24.00	38.00	31.00	65.00	106.00	85.50
7	IC016562	161.00	152.66	156.83	7.00	1.83	4.42	124.00	17.50	70.75	31.00	40.00	35.50	70.00	108.00	89.00
8	IC017372	142.00	149.60	145.80	6.00	2.16	4.08	124.00	23.80	73.90	25.00	42.00	33.50	65.00	110.00	87.50
9	IC017379	145.00	165.83	155.42	7.00	2.16	4.58	105.00	15.33	60.17	34.00	40.00	37.00	69.00	108.00	88.50
10	IC017971	152.00	175.16	163.58	7.00	2.00	4.50	180.00	19.50	99.75	30.00	42.00	36.00	68.00	110.00	89.00
11	IC018040	153.00	122.50	137.75	7.00	1.83	4.42	182.00	23.50	102.75	30.00	40.00	35.00	75.00	107.00	91.00
12	IC018751	131.00	113.00	122.00	7.00	2.16	4.58	258.00	23.83	140.92	38.00	43.00	40.50	78.00	112.00	95.00
13	IC024297	135.00	131.16	133.08	8.00	1.83	4.92	266.00	15.16	140.58	37.00	58.00	47.50	70.00	118.00	94.00
14	IC024299	121.00	174.00	147.50	7.00	3.16	5.08	146.00	15.00	80.50	35.00	40.00	37.50	68.00	108.00	88.00
15	IC037291	123.00	125.50	124.25	10.00	1.83	5.92	221.00	15.33	118.17	44.00	64.00	54.00	75.00	121.00	98.00
16	IC037294	124.00	137.16	130.58	8.00	1.83	4.92	192.00	16.66	104.33	41.00	58.00	49.50	81.00	118.00	99.50
17	IC042411	116.00	152.16	134.08	7.00	1.66	4.33	236.00	19.00	127.50	39.00	54.00	46.50	81.00	115.00	98.00
18	IC047458	102.00	140.33	121.17	7.00	1.83	4.42	210.00	13.66	111.83	41.00	53.00	47.00	82.00	114.00	98.00
19	IC049160	106.00	135.50	120.75	7.00	1.83	4.42	210.00	13.66	111.83	43.00	54.00	48.50	83.00	115.00	99.00
20	IC049661	100.00	133.00	116.50	7.00	2.00	4.50	213.00	17.16	115.08	39.00	53.00	46.00	83.00	115.00	99.00
21	IC049870	98.00	124.00	111.00	7.00	2.00	4.50	198.00	21.83	109.92	43.00	58.00	50.50	84.00	116.00	100.00
22	IC079228	83.00	111.33	97.17	7.00	1.66	4.33	182.00	15.50	98.75	42.00	40.00	41.00	84.00	106.00	95.00
23	IC094662	106.00	126.33	116.17	10.00	1.66	5.83	263.00	17.00	140.00	45.00	64.00	54.50	85.00	121.00	103.00
24	IC094663	100.00	127.33	113.67	7.00	2.33	4.67	242.00	21.00	131.50	45.00	48.00	46.50	88.00	112.00	100.00
25	IC094664	118.00	130.00	124.00	7.00	2.00	4.50	145.00	15.33	80.17	29.00	56.00	42.50	67.00	116.00	91.50
26	IC094678	91.00	122.16	106.58	8.00	1.83	4.92	238.00	18.33	128.17	43.00	62.00	52.50	73.00	119.00	96.00
27	IC094679	110.00	130.66	120.33	10.00	2.16	6.08	221.00	17.83	119.42	44.00	64.00	54.00	84.00	121.00	102.50
28	IC107116	113.00	145.33	129.17	10.00	2.00	6.00	217.00	16.00	116.50	44.00	64.00	54.00	84.00	120.00	102.00
29	IC107208	116.00	127.83	121.92	9.00	1.83	5.42	264.00	15.16	139.58	41.00	58.00	49.50	82.00	118.00	100.00
30	IC107291	92.00	125.33	108.67	9.00	2.33	5.67	222.00	16.50	119.25	43.00	64.00	53.50	79.00	120.00	99.50

Table 104. Multilocatior

S.No.	Accessions	Yield per plant (g)			Almora							Ranichauri	
		Almora	Ranichauri	Mean	Leaf length (cm)	Leaf width (cm)	Petiole length (cm)	Number of nodes per plant	Length of cyme (cm)	Number of inflorescence per plant	100 seed weight (g)	Plant girth at base (cm)	No. of secondary branch
1	EC125938	-	40.00	40.00	-	-	-	-	-	-	-	0.66	3.16
2	EC216627	6.80	30.00	18.40	5.20	3.80	2.20	12.00	4.00	62.00	2.50	0.83	3.16
3	EC323731	2.62	50.50	26.56	4.60	3.50	1.80	15.00	4.10	71.00	1.50	0.75	4.16
4	IC012664	2.52	36.00	19.26	5.10	4.30	3.60	18.00	4.20	81.00	1.90	0.75	3.16
5	IC016555	2.26	50.16	26.21	4.60	3.60	1.20	16.00	4.90	82.00	2.10	0.66	4.50
6	IC016559	1.58	38.60	20.09	7.00	4.10	1.00	17.00	5.30	65.00	1.30	0.83	3.50
7	IC016562	2.80	45.50	24.15	6.20	4.40	1.70	18.00	4.80	82.00	1.50	0.75	3.83
8	IC017372	2.06	30.50	16.28	6.50	4.90	2.20	16.00	4.90	80.00	2.00	0.66	4.33
9	IC017379	2.48	30.00	16.24	5.90	5.00	2.70	18.00	4.60	81.00	1.70	0.66	3.50
10	IC017971	4.74	50.00	27.37	4.00	3.00	2.20	18.00	3.00	158.00	1.70	0.75	3.50
11	IC018040	2.70	42.10	22.40	5.10	4.90	3.10	20.00	3.60	143.00	1.60	0.83	2.83
12	IC018751	7.02	33.50	20.26	4.30	4.40	2.30	20.00	4.80	173.00	1.90	0.75	3.50
13	IC024297	9.62	25.20	17.41	6.00	5.30	4.10	20.00	5.30	176.00	1.50	0.58	3.33
14	IC024299	7.32	50.00	28.66	5.00	4.10	4.00	18.00	5.30	127.00	1.80	0.50	3.50
15	IC037291	0.50	55.45	27.98	6.10	5.70	4.80	18.00	4.90	180.00	1.40	0.58	3.16
16	IC037294	4.16	50.00	27.08	5.20	4.70	3.40	20.00	5.60	116.00	1.70	0.58	3.33
17	IC042411	5.66	40.00	22.83	5.00	4.00	4.10	19.00	4.80	206.00	1.80	0.58	3.33
18	IC047458	3.90	25.45	14.68	3.90	3.30	4.30	18.00	4.40	154.00	1.60	0.50	3.16
19	IC049160	2.90	35.40	19.15	5.00	4.30	4.50	19.00	5.20	189.00	1.70	0.50	3.00
20	IC049661	2.26	35.00	18.63	4.50	4.10	4.00	19.00	3.70	171.00	1.60	0.66	3.16
21	IC049870	4.02	36.40	20.21	3.80	3.50	2.40	19.00	5.40	174.00	1.50	0.66	4.33
22	IC079228	3.38	48.40	25.89	3.80	3.90	1.80	20.00	4.90	168.00	1.70	0.50	3.16
23	IC094662	3.56	35.40	19.48	5.00	4.40	3.40	20.00	4.00	148.00	1.30	0.66	3.33
24	IC094663	3.66	30.00	16.83	4.20	4.00	2.90	22.00	4.20	158.00	1.90	0.58	3.50
25	IC094664	2.62	50.00	26.31	4.20	3.40	1.50	15.00	3.90	93.00	1.50	0.58	3.16
26	IC094678	2.02	50.70	26.36	4.20	3.50	1.90	18.00	3.30	216.00	1.80	0.58	4.16
27	IC094679	3.90	30.40	17.15	4.50	4.40	3.20	20.00	2.40	198.00	1.40	0.75	4.50
28	IC107116	4.96	50.45	27.71	4.80	4.00	2.30	21.00	4.00	194.00	1.30	0.75	3.50
29	IC107208	4.96	28.50	16.73	4.60	4.20	2.60	22.00	4.50	239.00	1.90	0.75	3.33
30	IC107291	4.86	52.62	28.74	3.00	2.80	2.00	19.00	4.40	193.00	1.70	0.75	3.33

S.No.	Accessions	Plant height (cm)			Number of primary branches			Number of leaves per plant			Days to 50% flowering			Days to maturity		
		Almora	Ranichauri	Mean	Almora	Ranichauri	Mean	Almora	Ranichauri	Mean	Almora	Ranichauri	Mean	Almora	Ranichauri	Mean
31	IC107293	105.00	129.16	117.08	8.00	2.16	5.08	269.00	17.16	143.08	44.00	65.00	54.50	84.00	122.00	103.00
32	IC107564	109.00	117.16	113.08	10.00	1.83	5.92	289.00	14.50	151.75	43.00	64.00	53.50	84.00	120.00	102.00
33	IC107575	97.00	121.16	109.08	7.00	2.00	4.50	273.00	22.00	147.50	43.00	62.00	52.50	81.00	118.00	99.50
34	IC107585	108.00	136.83	122.42	9.00	2.16	5.58	268.00	20.00	144.00	43.00	69.00	56.00	84.00	116.00	100.00
35	IC107610	126.00	124.83	125.42	10.00	2.00	6.00	288.00	16.66	152.33	44.00	64.00	54.00	84.00	115.00	99.50
36	IC107627	131.00	140.00	135.50	8.00	2.60	5.30	285.00	23.50	154.25	44.00	53.00	48.50	81.00	113.00	97.00
37	IC107959	112.00	133.50	122.75	7.00	2.16	4.58	226.00	17.00	121.50	45.00	58.00	51.50	84.00	112.00	98.00
38	IC107960	110.00	149.16	129.58	7.00	2.00	4.50	274.00	19.33	146.67	45.00	48.00	46.50	84.00	110.00	97.00
39	IC107968	121.00	140.83	130.92	9.00	2.00	5.50	226.00	27.83	126.92	45.00	58.00	51.50	86.00	115.00	100.50
40	IC107974	126.00	105.83	115.92	9.00	2.00	5.50	250.00	20.00	135.00	45.00	64.00	54.50	87.00	121.00	104.00
41	IC107986	82.00	123.16	102.58	5.00	2.00	3.50	153.00	20.00	86.50	41.00	48.00	44.50	84.00	110.00	97.00
42	IC107989	107.00	105.83	106.42	9.00	1.83	5.42	227.00	19.16	123.08	43.00	58.00	50.50	83.00	116.00	99.50
43	IC107995	113.00	123.16	118.08	9.00	2.33	5.67	127.00	18.33	72.67	44.00	64.00	54.00	86.00	120.00	103.00
44	IC108495	104.00	122.16	113.08	9.00	1.83	5.42	269.00	18.16	143.58	46.00	64.00	55.00	88.00	120.00	104.00
45	IC108496	101.00	124.50	112.75	8.00	1.83	4.92	258.00	21.16	139.58	49.00	65.00	57.00	89.00	121.00	105.00
46	IC108499	106.00	125.50	115.75	9.00	2.00	5.50	265.00	19.33	142.17	45.00	64.00	54.50	88.00	120.00	104.00
47	IC108500	111.00	117.83	114.42	9.00	2.00	5.50	269.00	21.66	145.33	45.00	58.00	51.50	87.00	115.00	101.00
48	IC108503	123.00	141.66	132.33	7.00	2.50	4.75	248.00	21.83	134.92	44.00	52.00	48.00	84.00	114.00	99.00
49	IC108504	110.00	135.66	122.83	9.00	2.00	5.50	241.00	19.33	130.17	44.00	44.00	44.00	81.00	112.00	96.50
50	IC386668	126.00	134.00	130.00	6.00	2.50	4.25	191.00	17.50	104.25	29.00	42.00	35.50	68.00	110.00	89.00
Means for check varieties																
	Himpriya	108.20	138.77	123.49	8.20	2.55	5.38	214.60	18.83	116.72	39.60	74.67	57.13	81.40	120.00	100.70
	PRB-1	134.80	150.61	142.70	7.00	2.11	4.55	214.60	19.66	117.13	41.00	46.33	43.67	80.60	112.33	96.47
	Shimla B-1	122.60	156.82	139.71	7.60	2.89	5.24	207.20	21.27	114.24	35.80	33.33	34.57	68.80	92.33	80.57
	VL Ugal 7	81.60	126.77	104.19	5.00	2.88	3.94	58.60	17.16	37.88	21.00	30.00	25.50	53.00	84.00	68.50
	Minimum	**81.60**	**105.83**	**93.72**	**5.00**	**1.66**	**3.33**	**58.60**	**13.66**	**36.13**	**21.00**	**30.00**	**25.50**	**53.00**	**84.00**	**68.50**
	Maximum	**161.00**	**175.16**	**168.08**	**10.00**	**3.16**	**6.58**	**289.00**	**27.83**	**158.42**	**49.00**	**74.67**	**61.83**	**89.00**	**122.00**	**105.50**
	Mean	**115.36**	**134.42**	**124.89**	**7.77**	**2.11**	**4.94**	**207.92**	**18.40**	**113.16**	**39.01**	**52.49**	**45.75**	**78.37**	**113.05**	**95.71**
	CD (0.05)	**23.76**	**-**	**-**	**2.47**	**-**	**-**	**161.17**	**-**	**-**	**2.40**	**-**	**-**	**8.25**	**-**	**-**
	CV (%) Error	**7.96**	**-**	**-**	**13.33**	**-**	**-**	**34.74**	**-**	**-**	**2.62**	**-**	**-**	**4.35**	**-**	**-**
	CV (%) Phenotypic	**15.60**	**11.49**	**11.46**	**17.06**	**15.72**	**15.04**	**28.85**	**16.53**	**29.12**	**18.66**	**21.16**	**18.66**	**10.73**	**6.54**	**7.45**

S.No.	Accessions	Yield per plant (g)			Almora							Ranichauri	
		Almora	Ranichauri	Mean	Leaf length (cm)	Leaf width (cm)	Petiole length (cm)	Number of nodes per plant	Length of cyme (cm)	Number of inflorescence per plant	100 seed weight (g)	Plant girth at base (cm)	No. of secondary branch
31	IC107293	1.56	45.00	23.28	4.90	5.40	4.80	18.00	3.60	220.00	1.10	0.66	3.83
32	IC107564	0.78	40.00	20.39	4.20	4.20	3.80	22.00	4.40	264.00	1.40	0.66	3.83
33	IC107575	0.44	52.10	26.27	4.10	4.10	2.70	22.00	4.40	233.00	1.10	0.91	4.00
34	IC107585	1.08	28.65	14.87	4.50	4.30	2.30	23.00	3.50	235.00	1.30	0.83	4.66
35	IC107610	3.56	50.00	26.78	5.50	5.10	3.30	21.00	4.00	260.00	1.50	0.83	4.00
36	IC107627	7.18	50.00	28.59	3.90	3.70	2.40	20.00	4.00	255.00	1.60	0.91	4.00
37	IC107959	5.58	38.60	22.09	4.20	4.50	3.10	20.00	2.40	200.00	1.30	0.75	4.00
38	IC107960	4.30	25.00	14.65	5.00	4.30	2.20	18.00	3.30	216.00	1.50	0.83	4.20
39	IC107968	3.46	28.00	15.73	3.90	3.40	4.60	20.00	3.20	172.00	1.80	0.91	3.83
40	IC107974	6.94	35.40	21.17	5.50	5.00	4.00	22.00	3.90	224.00	1.70	0.50	3.50
41	IC107986	2.62	46.10	24.36	3.50	3.60	3.00	17.00	3.60	90.00	1.80	0.50	4.50
42	IC107989	10.64	50.00	30.32	4.40	4.20	3.10	22.00	2.50	188.00	1.70	0.50	3.50
43	IC107995	6.32	30.60	18.46	5.20	5.20	4.20	21.00	3.30	119.00	1.30	0.50	4.20
44	IC108495	2.68	40.00	21.34	4.60	5.70	5.10	22.00	4.60	229.00	1.50	0.66	3.16
45	IC108496	2.88	38.40	20.64	4.80	4.90	5.70	23.00	5.40	160.00	1.70	0.50	3.50
46	IC108499	11.20	35.00	23.10	4.60	4.70	4.10	22.00	3.30	221.00	1.60	0.50	3.16
47	IC108500	10.60	48.10	29.35	5.70	5.50	3.20	21.00	4.10	255.00	1.90	0.75	3.33
48	IC108503	4.76	36.40	20.58	5.00	4.70	3.70	23.00	3.30	226.00	2.00	0.55	3.33
49	IC108504	9.82	55.00	32.41	5.10	4.80	3.30	20.00	4.40	217.00	1.70	0.50	4.00
50	IC386668	3.36	35.25	19.31	5.10	5.20	3.70	19.00	3.90	157.00	2.20	0.66	4.00
Means for check varietie													
	Himpriya	3.55	54.13	28.84	4.62	4.58	3.16	20.40	4.16	152.80	1.72	0.53	3.51
	PRB-1	2.46	59.28	30.87	4.60	4.18	2.92	19.00	4.48	188.60	1.46	0.61	3.27
	Shimla B-1	7.10	57.73	32.41	4.06	3.62	3.06	18.80	4.20	154.20	1.76	0.58	3.39
	VL Ugal 7	4.78	60.70	32.74	5.02	4.10	2.34	11.60	3.88	61.40	2.96	0.66	3.46
	Minimum	**0.44**	**25.00**	**12.72**	**3.00**	**2.80**	**1.00**	**11.60**	**2.40**	**61.40**	**1.10**	**0.50**	**2.83**
	Maximum	**11.20**	**60.70**	**35.95**	**7.00**	**5.70**	**5.70**	**23.00**	**5.60**	**264.00**	**2.96**	**0.91**	**4.66**
	Mean	**4.33**	**41.59**	**22.96**	**4.78**	**4.31**	**3.11**	**19.26**	**4.16**	**167.47**	**1.67**	**0.66**	**3.62**
	CD (0.05)	**5.95**	**-**	**-**	**1.65**	**1.94**	**2.83**	**5.26**	**1.62**	**161.01**	**0.55**	**-**	**-**
	CV (%) Error	**49.88**	**-**	**-**	**13.52**	**17.62**	**36.99**	**11.28**	**14.54**	**43.31**	**10.38**	**-**	**-**
	CV (%) Phenotypic	**60.91**	**23.76**	**24.41**	**16.08**	**15.75**	**33.49**	**12.82**	**18.69**	**34.77**	**19.31**	**18.75**	**12.50**

Table 105. Evaluation of germplam lines in Buckwheat at Shimla - Hills (2006)

S.No.	Accessions No.	Days to 50 % flowering	Leaf lengh (cm)	Leaf width (cm)	No. of leaf main shoot	No. of internodes main shoot	Petiole length (cm)	No. of primary brnaches	No.of Ifl. /Plant	Cyme length (cm)	Plant height (cm)	Days to 80% maturity	No. of seed / infl.	1000 seed wt. (g)
1	EC213682	68	8.80	7.50	15.50	15.00	4.35	4.00	38.00	7.15	184.50	134	5.00	22.50
2	EC218739	65	4.80	5.70	23.50	23.00	1.80	6.00	31.00	5.40	144.00	130	5.50	19.00
3	IC013191	72	6.00	7.75	17.50	17.00	3.30	5.50	34.00	6.10	129.30	133	6.00	12.10
4	IC013413	63	5.35	4.80	23.00	21.50	1.75	4.50	28.50	4.65	143.80	123	4.50	11.10
5	IC016553	67	3.60	4.45	19.00	18.50	2.75	4.00	19.50	2.75	133.50	123	5.50	14.10
6	IC049663	68	3.55	4.45	20.50	19.50	3.80	3.00	17.00	4.45	121.70	128	5.00	15.00
7	IC107986	69	4.15	4.05	21.00	18.50	2.35	5.00	15.00	2.75	101.00	125	5.00	14.30
8	IC360826	70	7.75	9.30	15.00	15.50	6.50	4.00	27.00	2.20	104.70	133	5.00	18.50
9	IC360829	74	8.30	2.75	16.50	16.50	3.45	4.00	62.50	7.05	159.00	133	7.00	21.60
10	IC360846	76	6.40	4.25	19.50	19.50	4.55	4.00	67.50	5.40	153.25	132	6.00	19.50
11	IC360847	74	5.50	5.86	12.00	12.00	4.70	5.00	30.00	4.05	93.00	131	4.00	17.70
12	IC361359	73	7.00	5.25	17.00	17.50	6.85	3.00	57.00	4.95	152.25	132	7.00	17.50
13	IC362260	76	8.35	8.85	18.00	15.50	5.95	4.00	35.00	7.30	102.30	135	7.00	13.20
14	IC381050	69	5.80	5.50	24.00	23.00	4.30	5.00	32.00	2.75	157.40	134	7.50	16.60
15	IC381074	74	6.75	6.05	19.00	19.50	3.60	4.00	36.50	4.35	140.45	137	4.00	17.50
16	IC381098	70	7.15	9.25	17.00	16.50	5.50	6.50	22.50	3.40	141.25	138	8.00	17.40
17	IC381120	71	4.65	4.65	16.00	16.50	3.50	3.00	16.50	3.15	100.55	128	4.50	-
18	IC423441	45	6.25	5.35	25.00	23.50	2.35	4.00	21.00	7.95	181.05	138	10.00	18.10
19	IC423485	69	4.05	4.05	18.00	17.50	4.15	3.00	16.00	2.40	97.80	128	4.50	17.60
20	IC447576	46	6.05	5.40	24.50	22.50	1.25	3.50	23.50	7.05	226.35	139	8.00	19.60
21	IC447577	66	2.25	4.80	21.50	20.50	2.40	6.00	25.00	2.80	131.35	133	5.00	15.50
22	IC447586	67	4.50	6.15	22.00	21.00	2.25	4.50	21.00	2.55	105.80	123	6.50	14.60
23	IC447689	47	5.25	5.20	19.00	18.50	2.20	3.50	19.50	5.40	194.70	138	8.50	20.80
24	IC447690	48	4.30	3.10	19.00	18.50	1.25	3.50	21.00	4.80	195.85	138	10.00	20.40
25	IC447691	48	3.55	3.60	23.50	21.50	1.40	4.00	18.50	4.50	196.75	139	9.50	21.90
26	IC447692	49	5.85	5.35	23.10	23.00	2.25	3.50	19.50	4.55	206.40	140	8.00	21.00
27	IC447693	48	6.65	4.50	27.00	25.50	1.80	3.50	22.00	4.65	102.55	140	7.00	20.50
28	IC447694	46	4.40	3.30	21.50	19.00	1.60	3.00	19.00	6.20	164.85	134	5.00	21.50
29	IC447695	46	4.55	4.10	23.00	20.00	2.35	3.50	19.00	4.45	170.80	140	6.00	21.10
30	IC540851	64	4.45	4.65	20.00	19.00	1.79	3.00	20.00	2.75	118.45	125	4.50	16.60

S.No.	Accessions No.	Days to 50 % flowering	Leaf lengh (cm)	Leaf width (cm)	No. of leaf main shoot	No. of internodes main shoot	Petiole length (cm)	No. of primary brnaches	No.of Ifl. /Plant	Cyme length (cm)	Plant height (cm)	Days to 80% maturity	No. of seed / infl.	1000 seed wt. (g)
31	IC540852	47	6.45	5.05	23.00	20.50	1.60	3.50	19.00	8.20	186.55	139	6.50	20.60
32	IC540853	46	4.30	4.20	23.00	22.50	1.55	3.00	19.00	7.40	177.70	138	5.50	20.30
33	IC540855	46	4.95	4.95	20.50	20.00	4.20	4.50	17.00	2.55	165.55	138	10.50	20.22
34	IC540856	56	4.70	4.70	11.00	11.50	5.15	3.50	14.00	2.80	70.70	138	4.00	15.06
35	IC540857	46	5.00	5.00	23.00	22.00	4.05	4.00	23.00	2.35	244.70	140	10.50	20.16
36	IC540858	48	7.50	7.05	23.50	22.50	6.90	3.50	24.00	3.85	163.15	141	9.50	24.00
37	IC540859	58	3.20	3.20	11.50	11.00	1.40	4.00	24.00	1.70	113.05	128	5.00	15.50
38	IC547310	72	6.15	6.70	13.00	13.50	3.30	3.00	27.00	4.40	152.60	136	7.00	20.00
39	IC547315	71	6.50	5.80	18.50	17.50	6.35	6.00	37.00	4.80	181.70	135	7.00	14.30
40	IC547346	72	7.85	8.95	18.00	17.50	7.20	5.00	44.50	9.15	181.35	133	7.00	17.60
41	IC547360	72	5.40	4.89	14.50	14.00	4.65	7.00	30.50	3.50	133.10	134	4.00	14.40
42	IC547373	46	4.25	3.45	26.00	24.50	2.70	4.50	22.00	3.25	186.15	138	8.00	21.50
43	IC547384	65	3.60	3.20	20.50	19.50	1.75	3.00	13.50	2.45	194.40	132	6.50	15.50
44	IC547388	67	2.70	2.45	13.50	12.50	1.60	2.00	12.50	2.25	93.75	128	6.00	14.60
45	IC547390	66	4.05	3.50	14.00	13.00	2.35	3.00	17.50	2.05	123.85	125	4.00	18.00
46	IC547396	67	3.15	3.45	18.50	16.50	2.60	2.50	20.50	2.25	118.45	138	6.00	17.00
47	IC547398	76	6.60	7.50	18.50	18.00	6.30	5.50	34.00	4.20	105.10	139	6.00	16.30
48	IC547548	73	9.45	8.35	23.50	22.50	4.40	6.00	39.50	8.40	176.50	137	4.00	20.00
49	IC547549	77	7.80	9.00	16.50	15.50	6.25	7.00	41.00	4.35	132.90	135	6.00	17.20
50	KP/05/119	45	5.25	4.60	20.50	18.50	1.55	3.50	18.00	6.85	150.55	138	4.00	
Means for check varieties														
	Himpriya	72.60	7.07	7.25	18.59	17.59	4.06	7.00	21.60	3.22	125.13	141.20	6.30	17.06
	PRB-1	52.20	5.66	6.04	19.94	22.52	2.75	5.82	46.72	5.13	147.80	143.40	6.46	15.47
	Shimla B1	46.20	5.89	6.15	17.55	18.09	2.40	5.62	40.22	6.77	181.94	85.00	8.20	16.62
	VL-7	45.40	5.56	5.90	19.80	20.04	2.93	5.00	45.53	6.02	131.68	86.80	6.44	15.58
	Minimum	**45.00**	**2.25**	**2.45**	**11.00**	**11.00**	**1.25**	**2.00**	**12.50**	**1.70**	**70.70**	**85.00**	**4.00**	**11.10**
	Maximum	**77.00**	**9.45**	**9.30**	**27.00**	**25.50**	**7.20**	**7.00**	**67.50**	**9.15**	**244.70**	**143.40**	**10.50**	**24.00**
	Mean	**61.49**	**5.54**	**5.39**	**19.41**	**18.63**	**3.41**	**4.27**	**27.52**	**4.55**	**148.02**	**132.41**	**6.36**	**17.76**
	CD (0.05)	**4.34**	**2.52**	**2.58**	**5.42**	**4.99**	**1.60**	**1.91**	**5.72**	**3.41**	**20.60**	**7.65**	**2.57**	**2.76**
	CV (%) Error	**3.00**	**15.63**	**15.26**	**10.71**	**9.55**	**19.74**	**12.24**	**5.57**	**24.19**	**5.26**	**2.51**	**14.06**	**6.38**
	CV (%) Phenotypic	**18.82**	**29.32**	**32.72**	**19.48**	**18.47**	**50.44**	**28.89**	**44.76**	**42.29**	**25.42**	**7.99**	**28.36**	**16.26**

Table 106. Characterization of germplasm lines in Buckwheat at Shimla - Hills (2006)

S.No.	Accessions No.	Plant Vigour	Growth habit	Flower colour	Leaf colour	Leaf margin colour	Leaf blade shape	Stem colour	Seed Shattering	Seed Shape	Seed colour
1	EC213682	3	3	5	3	5	2	7	3	1	7
2	EC218739	3	3	1	3	5	2	7	3	2	5
3	IC013191	3	3	1	3	5	2	7	3	1	7
4	IC013413	3	3	1	3	5	2	3	3	2	5
5	IC016553	3	3	1	3	5	2	3	3	2	3
6	IC049663	3	3	1	3	5	2	7	3	2	3
7	IC107986	3	3	1	3	5	2	7	3	2	5
8	IC360826	3	3	5	3	5	2	7	3	1	7
9	IC360829	3	3	5	3	5	2	7	3	1	5
10	IC360846	3	3	5	3	5	2	7	3	1	7
11	IC360847	3	3	1	3	5	2	7	3	1	7
12	IC361359	3	3	5	3	5	2	7	3	1	5
13	IC362260	3	3	1	3	5	2	7	3	1	7
14	IC381050	3	3	1	3	5	2	7	3	2	5
15	IC381074	3	3	5	3	5	2	7	3	1	5
16	IC381098	3	3	1	3	5	2	7	3	2	5
17	IC381120	3	3	1	3	5	2	3	3	2	5
18	IC423441	3	3	5	3	5	2	7	3	1	5
19	IC423485	3	3	1	3	5	2	3	3	2	5
20	IC447576	3	3	5	3	5	3	7	3	1	5
21	IC447577	3	3	1	3	5	2	5	3	2	5
22	IC447586	3	3	1	3	5	2	7	3	2	5
23	IC447689	3	3	5	3	5	2	7	3	1	5
24	IC447690	3	3	5	3	5	2	7	3	1	5
25	IC447691	3	3	5	3	5	2	7	3	1	5
26	IC447692	3	3	5	3	5	2	7	3	1	5
27	IC447693	3	3	5	3	5	2	7	3	1	5
28	IC447694	3	3	5	3	5	2	7	3	1	5
29	IC447695	3	3	5	3	5	2	7	3	1	5
30	IC540851	3	3	1	3	5	2	3	3	2	3
31	IC540852	3	3	5	3	5	2	7	3	1	5
32	IC540853	3	3	5	3	5	2	7	3	1	5
33	IC540855	3	3	5	3	5	2	7	3	1	5

S.No.	Accessions No.	Plant Vigour	Growth habit	Flower colour	Leaf colour	Leaf margin colour	Leaf blade shape	Stem colour	Seed Shattering	Seed Shape	Seed colour
34	IC540856	3	3	5	3	5	2	3	3	2	5
35	IC540857	3	3	5	3	5	2	7	3	1	5
36	IC540858	3	3	5	3	5	2	7	3	1	5
37	IC540859	3	3	5	3	5	2	7	3	2	5
38	IC547310	3	3	5	3	5	2	7	3	1	5
39	IC547315	3	3	5	3	5	2	7	3	1	5
40	IC547346	3	3	5	3	5	2	7	3	1	5
41	IC547360	3	3	5	3	5	2	7	3	1	5
42	IC547373	3	3	5	3	5	2	7	3	1	5
43	IC547384	3	3	1	3	5	2	3	3	2	5
44	IC547388	3	3	1	3	5	2	3	3	2	5
45	IC547390	3	3	1	3	5	2	3	3	2	5
46	IC547396	3	3	1	3	5	2	7	3	2	5
47	IC547398	3	3	1	3	5	2	7	3	1	5
48	IC547548	3	3	5	3	5	2	7	3	1	7
49	IC547549	3	3	1	3	5	2	7	3	1	7
50	KP/05/119	3	3	5	3	5	2	7	3	1	5
Means for check varieties											
	Himpriya	3	3	1	3	5	2	7	3	1	7
	PRB-1	3	3	1	3	5	3	7	3	1	5
	Shimla B1	3	3	1	3	5	3	7	3	1	3
	VL-7	3	3	1	3	5	3	7	5	1	7
	Minimum	**3**	**3**	**1**	**3**	**5**	**2**	**3**	**3**	**1**	**3**
	Maximum	**3**	**3**	**5**	**3**	**5**	**3**	**7**	**5**	**2**	**7**

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-conodial, 99-others; Seed colour: 3-grey, 5-brown, 7-black, 9-mottled, 99-others.

Table 107. Promising lines in Chenopodium germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Shimla (Accessions 25)				
1.	Days to 50% flowering	74.00-107.50	No Accessions	EC507741 (74.00 days)
2.	Days to maturity	139.0-166.0	No Accessions	EC507741 (139.00 days)
3.	Plant height (cm)	123.33-314.31	No Accessions	NIC22503 (314.31 cm)
4.	Leaf length (cm)	4.73-14.83	No Accessions	NIC22503 (14.83 cm)
5.	Leaf width (cm)	1.33-13.00	NIC22498 (> 12.85 cm)	NIC22503 (12.83 cm)
6.	Inflorescence length (cm)	36.28-47.60	NIC22517, IC540837, IC341696, NIC22496, EC359445 (> 44.63 cm)	NIC22503 (41.89 cm)
7.	1000 seed weight (g)	0.25-1.40	EC507733, IC540831 (> 1.35 g)	EC507741 (1.35 g)
8.	Seed yield/plant (g)	10.90-51.94	NIC22506, EC507733, NIC22498 (> 36.98 g)	NIC22503 (35.84 g)
Ranichauri (Accessions 25)				
1.	Days to 50% flowering	43.00-74.00	IC415493, EC507733, IC540831, IC447575, IC540836, IC540842, NIC022496, NIC022506 (< 58.0 days)	PRC 9801 (62.50 days)
2.	Days to maturity	90.00-136.00	IC415493, EC507733, IC540831, NIC022496, IC540836, NIC022506 (< 104.0 days)	PRC 9801 (127.00 days)
3.	Plant height (cm)	75.25-148.25	IC341707, IC341696 (> 137.75 cm)	EC507741 (136.50 cm)
4.	Inflorescence length (cm)	12.75-41.25	IC341707, IC341696 (> 39.85 cm)	EC507741 (39.75 cm)
5.	No. of leaves per plant	12.00-23.00	IC540811, IC109731, IC382223, IC341707, NIC022517, NIC022531 (> 18.50)	PRC 9801 (17.23)
6.	Seed yield per plant (g)	15.00-30.68	IC258332, IC341707, EC201680 (> 28.10 g)	EC507741 (26.10 g)

Best entries over locations				
1.	Days to 50% flowering	62.50-88.50	No accessions	PRC 9801 (62.50 days)
2.	Inflorescence length (cm)	25.00-43.24	IC341696, NIC022517, IC341707 (>41.83 cm)	EC507741 (40.60 cm)
3.	Plant height (cm)	107.04-227.54	IC341696 (> 225.00 cm)	NIC022503 (218.66 cm)
4.	Days to maturity	120.00-149.50	EC507733, IC415493, IC540831, IC447575, IC540836, IC540842 (<126.00 days)	PRC 9801 (127.00 days)
5.	Seed yield /plant (g)	13.83-36.22	NIC022506, EC507733, EC201680, IC540823, IC363733, NIC022498, NIC022517, IC540842 (>26.80 g)	NIC022503 (25.92 g)

Table 108. Multilocation evaluation of germplasm lines in Chenopodium at Shimla and Ranichauri - Hills (2006)

S.No.	Accession No.	Days to 50% flowering			Inflorescence length (cm)			Plant height (cm)			Days to maturity		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean
1	EC201680	83	63	72.75	40.50	34.25	37.38	239.18	130.25	184.71	142	128	135.00
2	EC359445	100	68	83.75	45.40	38.25	41.83	264.50	101.75	183.13	166	133	149.50
3	EC507733	81	48	64.50	42.78	21.00	31.89	242.75	89.75	166.25	145	95	120.00
4	IC109731	102	74	87.75	44.58	32.50	38.54	264.88	137.75	201.31	149	134	141.50
5	IC258332	105	72	88.50	39.90	30.75	35.33	296.15	118.25	207.20	146	136	141.00
6	IC341696	102	73	87.50	46.48	40.00	43.24	307.08	148.00	227.54	154	136	144.75
7	IC341699	97	72	84.25	40.40	26.00	33.20	246.23	115.25	180.74	148	134	141.00
8	IC341707	101	68	84.25	43.00	41.25	42.13	275.78	148.25	212.01	155	134	144.25
9	IC363733	98	68	82.75	41.85	23.00	32.43	251.70	101.75	176.73	148	134	140.75
10	IC382223	95	72	83.50	36.28	23.25	29.76	123.33	90.75	107.04	146	136	140.75
11	IC415493	108	43	75.25	36.58	17.50	27.04	245.25	87.75	166.50	152	90	121.00
12	IC447575	99	53	75.75	39.98	12.75	26.36	278.20	99.50	188.85	143	105	124.00
13	IC469276	98	68	83.00	39.98	26.00	32.99	264.10	128.25	196.18	153	128	140.50
14	IC540811	93	68	80.50	41.88	25.50	33.69	305.73	117.25	211.49	147	134	140.50
15	IC540823	94	63	78.25	42.53	23.75	33.14	308.98	105.00	206.99	146	129	137.50
16	IC540831	88	48	68.00	41.58	18.75	30.16	265.93	78.75	172.34	147	98	122.50
17	IC540834	82	62	71.75	38.95	26.00	32.48	243.18	119.50	181.34	148	125	136.50
18	IC540836	81	53	67.00	41.85	19.00	30.43	222.10	110.75	166.43	147	102	124.25
19	IC540837	90	58	74.00	46.75	15.00	30.88	273.95	85.00	179.48	148	118	133.00
20	IC540842	82	53	67.50	37.15	21.25	29.20	256.03	75.25	165.64	147	104	125.25
21	NIC022496	78	53	65.25	45.88	28.50	37.19	234.23	125.50	179.86	155	100	127.25
22	NIC022498	96	58	76.75	40.65	32.50	36.58	245.43	91.00	168.21	152	116	133.75
23	NIC022506	80	53	66.25	44.63	29.25	36.94	258.23	90.50	174.36	150	102	126.00

Table 108. Multilocation

S.No.	Accession No.	Seed yield /plant (g)			Shimla			No. of leaves /plant (Ranichauri)
		Shimla	Ranichauri	Mean	Leaf Length (cm)	Leaf width (cm)	1000 seed weight (g)	
1	EC201680	31.39	28.65	30.02	11.40	6.58	0.85	15.75
2	EC359445	23.55	20.02	21.79	12.65	12.63	0.60	13.00
3	EC507733	46.30	15.10	30.70	7.28	3.15	1.40	18.50
4	IC109731	31.13	21.50	26.32	11.85	10.40	0.50	20.50
5	IC258332	19.76	30.68	25.22	12.25	9.40	0.70	16.75
6	IC341696	29.09	24.50	26.80	12.28	8.90	0.70	17.00
7	IC341699	18.69	25.06	21.88	9.88	8.85	0.60	16.50
8	IC341707	14.94	30.60	22.77	12.40	10.33	0.60	20.00
9	IC363733	35.20	20.00	27.60	12.60	9.63	0.60	17.25
10	IC382223	10.90	16.75	13.83	4.73	4.43	0.25	20.50
11	IC415493	21.33	18.70	20.02	14.35	10.10	0.50	13.00
12	IC447575	31.33	16.05	23.69	13.05	10.85	0.95	14.50
13	IC469276	24.59	20.45	22.52	12.18	10.93	0.55	17.25
14	IC540811	24.51	26.75	25.63	14.10	10.93	0.60	23.00
15	IC540823	34.28	22.40	28.34	9.25	6.53	0.90	16.00
16	IC540831	24.55	18.72	21.64	10.03	6.65	1.35	15.50
17	IC540834	12.88	28.10	20.49	10.83	3.88	0.90	12.50
18	IC540836	13.42	15.00	14.21	5.13	1.33	0.40	16.75
19	IC540837	27.25	16.30	21.78	13.40	7.45	0.90	18.00
20	IC540842	36.98	17.72	27.35	11.25	5.68	1.00	13.45
21	NIC022496	19.21	18.50	18.86	11.20	10.40	0.75	12.00
22	NIC022498	38.67	16.45	27.56	14.48	13.00	0.70	14.00
23	NIC022506	51.94	20.50	36.22	9.90	5.40	1.20	16.75

S.No.	Accession No.	Days to 50% flowering			Inflorescence length (cm)			Plant height (cm)			Days to maturity		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean
24	NIC022517	105	68	86.25	47.60	36.75	42.18	295.68	118.00	206.84	146	132	139.00
25	NIC022531	99	68	83.25	40.23	38.00	39.11	282.70	122.25	202.48	149	136	142.25
													Means for check varieties
	EC507741 (C)	74.00	73	73.50	41.46	39.75	40.60	141.34	136.50	138.92	139	136	137.50
	NIC022503 (C)	102.50	63	82.75	41.89	31.75	36.82	314.31	123.00	218.66	156	127	141.25
	PRC 9801 (C)	-	62.50	62.50	-	25.00	25.00	-	118.25	118.25	-	127.00	127.00
	Minimum	**74.00**	**43.00**	**62.50**	**36.28**	**12.75**	**25.00**	**123.33**	**75.25**	**107.04**	**139.00**	**90.00**	**120.00**
	Maximum	**107.50**	**74.00**	**88.50**	**47.60**	**41.25**	**43.24**	**314.31**	**148.25**	**227.54**	**166.00**	**136.00**	**149.50**
	Mean	**92.81**	**62.34**	**77.04**	**41.88**	**27.76**	**34.52**	**257.29**	**111.21**	**181.77**	**148.85**	**121.75**	**134.91**
	CV (%) Phenotypic	**10.41**	**14.24**	**10.46**	**7.16**	**28.64**	**14.61**	**17.04**	**18.24**	**15.35**	**3.51**	**12.62**	**6.17**

S.No.	Accession No.	Seed yield /plant (g)			Shimla			No. of leaves /plant (Ranichauri)
		Shimla	Ranichauri	Mean	Leaf Length (cm)	Leaf width (cm)	1000 seed weight (g)	
24	NIC022517	30.25	24.66	27.46	9.90	8.98	0.50	19.75
25	NIC022531	19.52	25.44	22.48	11.93	10.20	0.80	19.50
	EC507741 (C)	20.28	26.10	23.19	7.37	4.61	1.35	14.75
	NIC022503 (C)	35.84	16.00	25.92	14.83	12.83	0.60	15.00
	PRC 9801 (C)	-	21.40	21.40	-	-	-	17.23
	Minimum	**10.90**	**15.00**	**13.83**	**4.73**	**1.33**	**0.25**	**12.00**
	Maximum	**51.94**	**30.68**	**36.22**	**14.83**	**13.00**	**1.40**	**23.00**
	Mean	**26.95**	**21.50**	**24.13**	**11.13**	**8.30**	**0.77**	**16.60**
	CV (%) Phenotypic	**37.33**	**22.32**	**19.64**	**23.61**	**37.65**	**38.37**	**16.46**

Table 109. Characterization of germplasm lines in Chenopodium at Shimla - Hills (2006)

S.No.	Accession No.	Qualitative character									
		Early Plant Vigour	Growth habit	Inflorescence colour	Inflorescence shape	Stem branching	Stem colour	Leaf colour	Leaf tip	Leaf shape	Seed colour
1	EC201680	3	1	3	1	1	3	1	1	6	3
2	EC359445	3	1	1	2	1	3	1	2	2	4
3	EC507733	3	1	1	3	2	3	1	1	2	4
4	IC109731	3	1	1	2	1	1	1	2	2	4
5	IC258332	3	1	1	2	1	1	1	2	2	4
6	IC341696	3	1	1	2	1	3	1	2	2	4
7	IC341699	3	1	3	2	1	3	1	2	2	3
8	IC341707	3	1	1	2	2	3	1	1	1	4
9	IC363733	3	1	1	2	1	3	1	1	1	4
10	IC382223	3	1	1	2	1	3	1	2	2	4
11	IC415493	3	1	3	2	3	3	1	2	1	4
12	IC447575	3	1	3	1	1	3	1	2	2	4
13	IC469276	3	1	1	2	1	3	1	2	2	4
14	IC540811	3	1	1	2	1	3	1	1	2	4
15	IC540823	3	1	1	2	1	3	1	1	2	3
16	IC540831	3	1	1	1	3	3	1	1	2	4
17	IC540834	3	1	3	1	1	3	1	1	6	4
18	IC540836	3	1	1	1	2	3	1	1	6	4
19	IC540837	3	1	1	2	1	3	1	2	6	4
20	IC540842	3	1	3	1	1	3	1	1	6	4
21	NIC022496	3	1	3	1	2	3	1	1	2	4
22	NIC022498	3	1	1	1	2	3	1	1	2	4
23	NIC022506	3	1	1	1	2	1	1	1	2	4
24	NIC022517	3	1	3	1	2	3	1	1	2	4

S.No.	Accession No.	Qualitative character									
		Early Plant Vigour	**Growth habit**	**Inflorescence colour**	**Inflorescence shape**	**Stem branching**	**Stem colour**	**Leaf colour**	**Leaf tip**	**Leaf shape**	**Seed colour**
25	NIC022531	3	1	1	2	1	2	1	2	2	4
Means for check varieties											
	EC507741 (C)	3	1	1	1	2	1	1	1	2	1
	NIC022503 (C)	3	1	3	2	2	3	1	1	1	4
	PRC 9801 (C)	-	-	-	-	-	-	-	-	-	-
	Minimum	**3**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	Maximum	**3**	**1**	**3**	**3**	**3**	**3**	**1**	**2**	**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 axillery 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 110. Promising lines in Adzukibean germplasm for various characters at various locations (Hills).

S.No.	Characters	Range	Promising lines	Highest value of best check
Shimla (Accessions 25)				
1.	Days to 50% flowering	48.00-66.00	EC340240, EC120460, EC341961 (< 50.0 days)	HPU-51 (52.67 days)
2.	Days to maturity	104.00-112.00	EC240254, IC341949, EC340267, IC089957, EC108080, EC018256, EC120460, EC281186, EC341961, IC341953, EC080850 (< 106.0 days)	HPU-51 (107.33 days)
3.	Plant height (cm)	46.80-97.00	IC341949, IC024105, EC018257, IC341952, EC187898, EC240246, IC024522, IC341944, EC469173, EC341953 (> 67.30 cm)	HPU-51 (61.80 cm)
4.	No. of primary branches per plant	4.00-8.30	EC057459, EC108080, EC018257, EC281186, IC024105, EC240254, EC000372, IC341953, EC340244, EC018256, IC024105 (> 6.00)	HPU-51 (5.30)
5.	No. of cluster per plant	7.00-14.70	EC080850, IC341949, IC089957, EC341953, EC340244, EC187898, EC240246, EC340254, EC240254, IC341944, EC500248, IC341953 (> 11.00)	HPU-51 (10.05)
6.	No. of pods per cluster	2.00-5.60	IC024105, IC341949, EC187898, IC341952 (> 4.30)	HPU-51 (3.62)
7.	No. of pod per plant	16.00-32.60	EC469173, IC341953, IC341952, IC024105, EC341953, EC120460, EC087895 (> 29.30)	HPU-51 (26.48)
8.	No. of seed per pod	5.60-11.60	EC281186, EC469173, EC340267, IC089957, EC341961 (> 8.60)	HPU-51 (7.77)
9.	100 seed weight (g)	7.68-98.10	EC018256, EC000248, EC087895, EC340254, EC500248, EC240254, IC089957, IC089957, IC341953, IC024522, IC024522 (> 10.84 g)	HPU-51 (8.93 g)
10.	Seed yield/plant (g)	3.36-32.01	EC087895 (> 32.00 g)	HPU-51 (28.09 g)
Ranichauri (Accessions 25)				
1.	Days to 50% flowering	45.00-62.00	EC000248, EC281186, EC341961, IC341949, EC108080, EC240246, EC340240, IC341944, IC341953 (< 55.0 days)	HPU 51 (57.00 days)
2.	Days to maturity	112.0-133.0	IC341949, EC000248, EC281186, EC341961, EC108080, EC240246, EC340240, IC341944, IC341953 (< 121.0 days)	HPU 51 (123.67 days)
3.	Plant height (cm)	38.50-80.60	EC087895, EC341961, IC341944, EC000248, EC108080, IC024105, IC341949, EC340267 (> 64.00 cm)	HPU 51 (61.35 cm)
4.	No. of pod per plant	3.65-10.40	EC340244, IC341952, IC341944, EC087895, EC000248, IC341949, EC000372 (> 8.40)	HPU 51 (6.37)

5.	Pod length (cm)	6.00-10.00	IC341953, IC341952, EC341961 (> 9.0 cm)	HPU 51 (8.98 cm)
6.	No. of seed per pod	3.50-7.40	IC341949, EC080850, EC108080, EC057459, IC341952, IC341953, EC087895 (> 6.25)	HPU 51 (5.79)
7.	No. of leaves per plant	5.66-11.65	IC341944, EC340267 (> 10.75)	HPU 51 (10.72)
8.	Seed yield per plant (g)	21.72-42.50	IC341952, EC340267, EC340244, EC240246, EC000372 (> 36.42 g)	HPU 51 (32.02 g)
Best entries over locations				
1.	Days to 50% flowering	47.00-62.50	EC341961, EC340240, EC000248, EC120460, IC341953, IC341949 (<54.00 days)	HPU-51 (54.83 days)
2.	No. of pod /plant (cm)	9.98-19.50	EC087895, IC024105, IC341953, EC080850, EC340244, IC341944, EC018256, EC120460 (>16.45 cm)	HPU-51 (16.43 cm)
3.	Plant height (cm)	52.05-81.40	IC341949, EC087895, EC341961, EC018257, IC024105, EC240246, IC341952, EC340244, EC057459, EC340267 (>61.72 cm)	HPU-51 (61.57 cm)
4.	Days to maturity	109.50-120.00	EC341961, EC281186, EC108080, EC000248, IC341949, IC341953, EC340240 (<112.00 days)	HPU-51 (115.50 days)
5.	Seed yield/plant (g)	15.84-33.71	EC340244, IC341952, EC087895, EC240246 (>30.71 g)	HPU-51 (30.05 g)
6.	No. of seed /pod	5.30-8.43	EC281186, EC057459,IC341952, EC340267, IC341949, EC080850, IC341953 (>7.20)	HPU-51 (6.78)

Table 111. Multilocational evaluation of germplasm lines in adzuki bean at Shimla and Ranichauri - Hills (2006)

S.N.	Accession No.	Days to 50% flowering			No. of pod /plant (cm)			Plant height (cm)			Days to maturity		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean
1	EC000248	56	45	50.50	21.00	9.00	15.00	46.80	66.85	56.83	106	114	110.00
2	EC000372	65	56	60.50	20.00	8.60	14.30	63.60	59.83	61.72	108	123	115.50
3	EC018256	61	56	58.50	29.30	5.20	17.25	50.70	55.80	53.25	104	123	113.50
4	EC018257	62	61	61.50	25.00	6.85	15.93	71.40	62.40	66.90	106	131	118.50
5	EC057459	63	55	59.00	16.30	7.40	11.85	63.60	62.00	62.80	107	121	114.00
6	EC080850	63	62	62.50	29.00	7.80	18.40	52.30	64.00	58.15	105	133	119.00
7	EC087895	54	62	58.00	30.00	9.00	19.50	60.00	80.60	70.30	108	131	119.50
8	EC108080	59	50	54.50	22.00	6.80	14.40	52.40	66.85	59.63	104	116	110.00
9	EC120460	49	55	52.00	30.30	4.00	17.15	62.60	52.50	57.55	105	122	113.50
10	EC187898	59	55	57.00	23.60	8.40	16.00	69.30	54.00	61.65	108	121	114.50
11	EC240246	59	50	54.50	22.30	6.80	14.55	68.60	62.50	65.55	108	116	112.00
12	EC281186	63	45	54.00	24.30	5.00	14.65	62.60	57.40	60.00	105	114	109.50
13	EC340240	48	50	49.00	23.20	5.20	14.20	64.40	58.65	61.53	107	116	111.50
14	EC340244	57	55	56.00	25.60	10.40	18.00	66.50	60.50	63.50	107	121	114.00
15	EC340254	55	60	57.50	25.00	4.50	14.75	65.60	38.50	52.05	112	128	120.00
16	EC340267	59	61	60.00	25.30	6.40	15.85	59.80	64.65	62.23	104	130	117.00
17	EC341961	49	45	47.00	25.30	7.60	16.45	61.60	78.00	69.80	105	114	109.50
18	IC024105	62	55	58.50	32.30	6.20	19.25	67.30	66.20	66.75	109	121	115.00
19	IC024522	54	61	57.50	20.00	4.40	12.20	66.00	57.00	61.50	109	130	119.50
20	IC089957	61	60	60.50	18.30	5.60	11.95	56.80	58.80	57.80	104	128	116.00
21	IC341944	62	50	56.00	25.30	9.40	17.35	51.50	67.80	59.65	108	116	112.00
22	IC341949	59	46	52.50	22.00	8.60	15.30	97.00	65.80	81.40	109	112	110.50

Table 111. Multilocational

S.N.	Accession No.	Seed yield/plant (g)			No. of seed /pod			Shimla					Ranichauri	
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	No. of primary branches	No. of clusters/ plant	No. of pod/cluster	100 seed weight (g)	Total weight (g)	Pod length (cm)	No. of leaves /plant
1	EC000248	23.38	30.00	26.69	6.60	6.00	6.30	6.00	9.00	2.30	16.44	233.84	7.25	8.16
2	EC000372	24.60	36.75	30.68	7.30	5.20	6.25	6.60	9.00	3.30	9.48	288.72	8.80	10.00
3	EC018256	18.18	22.50	20.34	8.60	5.20	6.90	6.30	8.60	3.00	98.10	163.68	6.60	9.40
4	EC018257	13.24	30.10	21.67	5.60	5.16	5.38	7.30	7.00	3.00	10.84	135.49	8.40	9.60
5	EC057459	3.36	28.32	15.84	8.60	7.00	7.80	8.30	10.30	2.60	7.68	33.63	8.20	8.22
6	EC080850	13.61	33.40	23.51	7.30	7.25	7.28	5.00	14.70	2.60	8.90	149.77	8.85	9.80
7	EC087895	32.01	34.45	33.23	7.60	6.65	7.13	4.30	11.00	4.00	16.20	384.20	7.80	10.33
8	EC108080	21.04	26.88	23.96	7.00	7.20	7.10	7.60	7.30	2.60	8.50	189.40	7.00	8.45
9	EC120460	16.88	28.00	22.44	6.60	4.16	5.38	5.00	9.00	3.60	8.42	132.23	6.60	8.25
10	EC187898	11.30	32.45	21.88	8.60	5.00	6.80	6.00	12.00	5.00	8.24	101.71	8.20	8.33
11	EC240246	23.43	38.75	31.09	8.60	5.80	7.20	4.30	10.00	4.00	8.14	234.32	9.00	5.66
12	EC281186	27.18	29.05	28.12	11.60	5.25	8.43	7.30	10.00	2.60	10.84	271.85	6.65	10.65
13	EC340240	21.11	26.28	23.70	8.30	5.20	6.75	5.60	8.00	2.60	10.16	295.57	8.85	8.33
14	EC340244	27.41	40.00	33.71	6.60	6.25	6.43	6.30	12.00	3.30	8.86	274.00	8.65	6.66
15	EC340254	18.42	25.00	21.71	7.60	6.00	6.80	4.60	12.00	2.00	13.44	92.43	6.00	8.00
16	EC340267	19.57	41.84	30.71	9.60	5.33	7.47	5.30	10.60	2.60	9.76	195.73	8.80	10.80
17	EC341961	19.52	22.90	21.21	9.30	5.00	7.15	5.30	9.00	3.30	9.26	156.23	9.40	8.60
18	IC024105	12.51	30.82	21.67	7.60	4.66	6.13	6.30	9.30	5.60	8.18	75.10	8.00	10.45
19	IC024522	25.25	27.62	26.44	7.60	4.83	6.22	5.30	10.30	2.30	11.27	126.28	8.40	9.45
20	IC089957	11.66	27.45	19.56	6.60	4.85	5.73	6.00	8.00	2.00	12.32	140.09	7.20	10.00
21	IC341944	13.41	36.42	24.92	6.60	4.00	5.30	5.30	9.00	3.60	10.28	120.74	7.25	11.65
22	IC341949	22.99	28.70	25.85	7.30	7.40	7.35	4.00	14.00	5.00	9.84	275.89	9.00	9.50

S.N.	Accession No.	Days to 50% flowering			No. of pod /plant (cm)			Plant height (cm)			Days to maturity		
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean
23	IC341952	66	55	60.50	16.00	10.25	13.13	69.60	60.20	64.90	111	121	116.00
24	IC341953	55	50	52.50	32.60	5.50	19.05	58.60	62.80	60.70	105	116	110.50
25	IC469173	60	55	57.50	16.30	3.65	9.98	66.90	56.00	61.45	107	121	114.00
Means for check varieties													
	HPU-51	52.67	57.00	54.83	26.48	6.37	16.43	61.80	61.35	61.57	107.33	123.67	115.50
	Minimum	**48.00**	**45.00**	**47.00**	**16.00**	**3.65**	**9.98**	**46.80**	**38.50**	**52.05**	**104.00**	**112.00**	**109.50**
	Maximum	**66.00**	**62.00**	**62.50**	**32.60**	**10.40**	**19.50**	**97.00**	**80.60**	**81.40**	**112.00**	**133.00**	**120.00**
	Mean	**58.18**	**54.31**	**56.24**	**24.11**	**6.88**	**15.49**	**62.97**	**61.58**	**62.27**	**106.86**	**121.64**	**114.25**
	CV (%) Phenotypic	**8.47**	**10.12**	**7.04**	**19.54**	**28.06**	**15.74**	**15.10**	**12.92**	**9.35**	**2.01**	**5.10**	**2.90**

S.N.	Accession No.	Seed yield/plant (g)			No. of seed /pod			Shimla					Ranichauri	
		Shimla	Ranichauri	Mean	Shimla	Ranichauri	Mean	No. of primary branches	No. of clusters/ plant	No. of pod/cluster	100 seed weight (g)	Total weight (g)	Pod length (cm)	No. of leaves /plant
23	IC341952	24.31	42.50	33.41	8.30	6.85	7.58	5.00	10.00	5.00	9.00	291.81	9.50	8.16
24	IC341953	18.93	26.48	22.71	7.60	6.83	7.22	6.30	11.30	3.60	11.64	189.38	10.00	10.20
25	IC469173	21.74	21.72	21.73	7.60	3.50	5.55	5.60	10.00	2.60	9.24	217.20	6.85	8.65
Means for check varieties														
	HPU-51	28.09	32.02	30.05	7.77	5.79	6.78	5.30	10.05	3.62	8.93	181.07	8.98	10.72
	Minimum	**3.36**	**21.72**	**15.84**	**5.60**	**3.50**	**5.30**	**4.00**	**7.00**	**2.00**	**7.68**	**33.63**	**6.00**	**5.66**
	Maximum	**32.01**	**42.50**	**33.71**	**11.60**	**7.40**	**8.43**	**8.30**	**14.70**	**5.60**	**98.10**	**384.20**	**10.00**	**11.65**
	Mean	**19.74**	**30.78**	**25.26**	**7.78**	**5.63**	**6.71**	**5.78**	**10.06**	**3.30**	**13.61**	**190.40**	**8.09**	**9.15**
	CV (%) Phenotypic	**32.75**	**18.87**	**18.99**	**15.56**	**18.84**	**11.98**	**18.37**	**18.33**	**29.90**	**127.66**	**43.43**	**13.18**	**14.81**

Table 112. Charecterization of germplasm lines in Adzuki bean at Shimla - Hills (2006)

S.No.	Accession No.	Qualitative character										
		Early plant vigour	Plant habit	Growth habit	Leaf colour	Leaf surface	Leaflet shape	Flower colour	Stem colour	Stem surface	Pod angle	Pod surface
1	EC000248	2	2	1	2	1	1	2	3	1	2	1
2	EC000372	2	1	1	2	1	1	2	3	1	1	1
3	EC018256	3	1	1	2	1	1	2	3	1	1	1
4	EC018257	3	1	1	2	1	1	2	3	1	1	1
5	EC057459	2	1	1	2	1	1	2	3	1	1	1
6	EC080850	2	1	1	2	1	1	2	3	1	1	1
7	EC087895	3	1	1	2	1	2	2	3	1	1	1
8	EC108080	2	1	1	2	1	1	2	3	1	1	1
9	EC120460	3	1	1	2	1	1	2	3	1	1	1
10	EC187898	3	1	1	1	1	1	2	3	1	1	1
11	EC240246	2	1	1	2	1	1	2	3	1	1	1
12	EC281186	2	1	1	2	1	1	2	3	1	1	1
13	EC340240	2	1	1	2	1	1	2	3	1	1	1
14	EC340244	2	1	1	2	1	1	2	3	1	1	1
15	EC340254	2	1	1	2	1	1	2	3	1	1	1
16	EC340267	2	1	1	2	1	1	2	3	1	1	1
17	EC341961	2	1	1	2	1	1	2	3	1	1	1
18	IC024105	2	1	1	2	1	1	2	3	1	1	1
19	IC024522	3	1	1	2	1	1	2	3	1	1	1
20	IC089957	3	1	1	2	1	1	2	3	1	1	1
21	IC341944	2	1	1	2	1	1	2	3	1	1	1
22	IC341949	2	1	1	2	1	1	2	3	1	1	1
23	IC341952	3	1	1	2	1	1	2	3	1	1	1
24	IC341953	3	1	1	2	1	1	2	3	1	1	1
25	IC469173	2	1	1	2	1	1	2	3	1	1	1
Means for check varieties												
	HPU-51	2	1	1	2	1	1	2	3	1	1	1
	Minimum	**2**	**1**	**1**	**1**	**1**	**1**	**2**	**3**	**1**	**1**	**1**
	Maximum	**3**	**2**	**1**	**2**	**1**	**2**	**2**	**3**	**1**	**2**	**1**

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

S.No.	Characters	Range	Promising lines	Highest value of best check
Bhowali (Accessions 52)				
1.	Days to 50% flowering	101.00-145.00	No Accessions	Champawat local (101.00 days)
2.	Days to maturity	140.50-175.00	No Accessions	Champawat local (140.50 days)
3.	Plant height (cm)	70.00-211.00	RS-12, IC003865 (> 204.00 cm)	Almora local (200.00 cm)
4.	Leaf length (cm)	13.00-30.00	IC374313, IC419477, EC216268, IC419564, IC006440, IC538084 (> 28.00 cm)	Almora local (26.70 cm)
5.	Leaf width (cm)	10.50-22.00	IC419564, IC374313, IC419477 (> 20.00 cm)	Almora local (16.63 cm)
6.	No. of primary branches per plant	4.00-25.50	No Accessions	Almora local (25.50)
7.	Petiole length (cm)	5.00-16.50	IC374609, IC419477, IC419706, IC316240 (> 13.00)	Almora local (12.45 cm)
8.	Inflorescence length (cm)	4.00-18.00	Perilla osciwoides (10), Perilla (5), IC538084, H-529 (> 11.50 cm)	Champawat local (10.75 cm)
9.	100 seed weight (g)	0.12-2.40	Perilla osciwoides (10), IC003942, IC316240, IC003708 (> 2.00 g)	Shillong local (1.75 g)
10.	Seed yield/plant (g)	0.40-10.00	IC006440, H-529, IC538084, BDS-837, IC003708, Perilla (5) (> 6.20 g)	Champawat local (5.33 g)
Ranichauri (Accessions 19)				
1.	Days to 50% flowering	79.00-99.00	SS491, SSAKM 122, SS535, SS539, SSAKM 52, SSAKM 88, SS452, SS622, SSAKM 19 (< 88.0 days)	SHILLONG (94.00 days)
2.	Days to maturity	165.00-182.00	SS491, SSAKM 122, SS535, SSAKM 88, SS539, SSAKM 52, SS452, SS622, SSAKM 19 (< 174.0 days)	SHILLONG (178.00 days)
3.	Plant height (cm)	71.40-166.80	SS539 (> 165.0 cm)	SHILLONG (136.25 cm)

4.	100 seed weight (g)	1.24-1.34	SSAKM 19, SS 486, SS 539, SSAKM 68, SS 359, SSAKM 88 SS5 35 (> 1.29 g)	SHILLONG (1.27 g)
5.	Seed yield (g/plot)	36.12-109.43	SS3 59, SS 570, SSAKM 68, SS 491 (> 86.70 g/plot)	SHILLONG (64.68 g/plot)
Best entries over locations				
1.	Days to 50% flowering	97.00-120.00	SSAKM 22, SSAKM 122 ,SSAKM 52, SS539, SS491,SSAKM 88 SSAKM 19, SSAKM 72, SS452, SS535 (<113.50 days)	SHILLONG (115.00 days)
2.	Days to maturity	160.00-172.75	SS539, SSAKM 88, SS491, SS570, SSAKM 122, SSAKM 19, SS452, SS622 (<164.50 days)	SHILLONG (172.75 days)
3.	Plant height (cm)	70.70-137.00	SS359, SS452 (>131.00 cm)	SHILLONG (130.38 cm)
4.	100 seed weight (g)	0.72-1.60	SS359, SS551 (> 1.54 g)	SHILLONG (1.51 g)

Table 114. Multilocational evaluation of germplasm lines in Perilla at Ranichauri and Bhowali - 2006 (Hills)

S.No.	Genotypes	Days to 50 % flowering			Days to maturity			Plant height (cm)		
		Ranichauri	Bhowali	Mean	Ranichauri	Bhowali	Mean	Ranichauri	Bhowali	Mean
1	SS266	96	142	119.00	180	165	172.50	84.80	75	79.90
2	SS284	94	140	117.00	178	162	170.00	81.60	105	93.30
3	SS359	95	145	120.00	179	162	170.50	124.00	150	137.00
4	SS452	86	140	113.00	172	155	163.50	90.80	174	132.40
5	SS486	99	140	119.50	182	155	168.50	110.45	92	101.23
6	SS491	79	140	109.50	165	160	162.50	118.25	103	110.63
7	SS523	88	140	114.00	174	160	167.00	81.00	93	87.00
8	SS535	84	142	113.00	169	160	164.50	71.40	70	70.70
9	SS539	84	135	109.50	170	150	160.00	166.80	74	120.40
10	SS551	92	135	113.50	174	160	167.00	107.00	130	118.50
11	SS570	89	140	114.50	175	150	162.50	119.20	73	96.10
12	SS622	86	142	114.00	172	155	163.50	114.40	85	99.70
13	SSAKM 122	79	135	107.00	166	160	163.00	114.00	79	96.50
14	SSAKM 19	86	135	110.50	172	155	163.50	106.60	84	95.30
15	SSAKM 22	89	105	97.00	176	155	165.50	93.00	115	104.00
16	SSAKM 52	84	135	109.50	170	162	166.00	116.00	116	116.00
17	SSAKM 68	94	140	117.00	176	162	169.00	115.80	92	103.90
18	SSAKM 72	88	135	111.50	175	160	167.50	125.45	85	105.23
19	SSAKM 88	84	135	109.50	169	155	162.00	108.25	83	95.63
Mean for check verities										
	SHILLONG	94.00	136.00	115.00	178.00	167.50	172.75	136.25	124.50	130.38
	Minimum	**79.00**	**105.00**	**97.00**	**165.00**	**155.00**	**160.00**	**71.40**	**79.00**	**70.70**
	Maximum	**99.00**	**140.00**	**120.00**	**182.00**	**167.50**	**172.75**	**166.80**	**124.50**	**137.00**
	Mean	**88.50**	**132.00**	**112.68**	**173.60**	**159.56**	**166.06**	**109.25**	**97.31**	**104.69**
	CV (%) Phenotypic	**6.31**	**6.16**	**4.62**	**2.65**	**2.89**	**2.19**	**19.98**	**28.42**	**16.45**

Table 114. Multilocational

S.No.	Genotypes	100 seed weight (g)			Bhowali					
		Ranichauri	Bhowali	Mean	Leaf length (cm)	Leaf width (cm)	No. of primary branches	Petiole length (cm)	Inflorescence length (cm)	Seed yield / plant (g)
1	SS266	1.25	1.4	1.33	13.0	10.5	4	7.7	4.0	2.8
2	SS284	1.27	1.6	1.44	22.0	15.0	15	8.0	7.5	0.7
3	SS359	1.30	1.9	1.60	25.0	16.0	18	10.5	8.0	1.4
4	SS452	1.29	1.6	1.45	22.0	13.5	12	6.0	10.0	1.5
5	SS486	1.33	1.5	1.42	18.0	11.5	12	6.5	7.5	1.6
6	SS491	1.26	1.6	1.43	21.0	12.5	12	6.7	6.5	2.8
7	SS523	1.24	1.5	1.37	20.5	12.5	14	7.0	8.0	3.8
8	SS535	1.30	1.7	1.50	19.5	11.5	13	6.7	6.0	3.7
9	SS539	1.32	1.4	1.36	18.5	12.0	12.5	6.0	9.5	5.0
10	SS551	1.28	1.9	1.59	21.0	14.0	12	8.5	10.0	1.1
11	SS570	1.28	1.8	1.54	20.0	12.5	12	7.5	6.5	1.2
12	SS622	1.24	1.5	1.37	24.0	13.0	11	5.5	7.0	1.8
13	SSAKM 122	1.28	1.5	1.39	21.5	14.5	10	6.0	9.0	2.0
14	SSAKM 19	1.34	1.3	1.32	22.0	13.0	14	5.0	9.0	5.0
15	SSAKM 22	1.25	1.6	1.43	24.0	16.3	10	6.0	7.0	1.9
16	SSAKM 52	1.29	1.2	1.25	25.5	15.0	12	12.2	9.5	0.5
17	SSAKM 68	1.31	0.12	0.72	20.5	13.0	13	9.0	7.7	0.5
18	SSAKM 72	1.24	1.1	1.17	20.0	13.0	12	9.0	8.0	0.5
19	SSAKM 88	1.30	1.7	1.50	21.0	14.5	4	6.2	11.0	0.5
Mean for check verities										
	SHILLONG	1.27	1.75	1.51	20.13	10.68	12.75	8.15	7.23	1.30
	Minimum	**1.24**	**0.12**	**0.72**	**20.00**	**10.68**	**4.00**	**5.00**	**7.00**	**0.50**
	Maximum	**1.34**	**1.75**	**1.60**	**25.50**	**16.30**	**14.00**	**12.20**	**11.00**	**5.00**
	Mean	**1.28**	**1.28**	**1.38**	**21.83**	**13.75**	**10.97**	**7.69**	**8.55**	**1.53**
	CV (%) Phenotypic	**2.34**	**29.91**	**13.77**	**12.53**	**11.86**	**28.96**	**23.21**	**19.18**	**93.77**

Table 115. Characterization of germplasm lines in Perilla at Bhowali - 2006 (Hills)

S.No.	Genotypes	Qualitative characters				
		Early plant vigour	Flower colour	Leaf shape	Leaf margin	Leaf pubescence
1	SS266	1	1	4	3	7
2	SS284	2	1	4	3	7
3	SS359	2	1	4	3	7
4	SS452	2	1	4	3	7
5	SS486	2	1	4	3	5
6	SS491	2	3	4	3	7
7	SS523	2	1	4	3	7
8	SS535	2	3	4	3	7
9	SS539	1	3	4	3	7
10	SS551	2	1	4	3	7
11	SS570	1	1	4	3	5
12	SS622	1	3	4	3	7
13	SSAKM 122	2	3	4	3	7
14	SSAKM 19	2	1	4	3	5
15	SSAKM 22	2	1	4	3	7
16	SSAKM 52	2	1	4	3	7
17	SSAKM 68	2	1	4	3	7
18	SSAKM 72	2	1	4	3	7
19	SSAKM 88	2	1	4	3	7
Mean for check verities						
	SHILLONG	2	1	4	3	6
	Minimum	**2**	**1**	**4**	**3**	**5**
	Maximum	**2**	**3**	**4**	**3**	**7**

Descriptors: Early plant vigour: 1-Poor, 2-Good, 3-Very good; Flower colour: 1-White, 2-Purple, 3-Violet; Leaf shape: 1-Round, 2-Ovate, 3-Obovoid, 4-Orbicular, 5-Cordate, 6-Ovate lanceolate; Leaf margin: 1-Entire, 2-Serrated, 3-Dented, 4-Crenate;

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 six locations viz. NBPGR New Delhi; RAU Mandor, HAU Hisar, PAU Ludhiana, GAU S.K. Nagar and NDUAT, Faizabad. The results were received from only three locations. The checks used were Annapurna, GA-1 and GA-2 at Faizabad; Annapurna, GA-1, GA-2 and Suvarna at Bhubaneswar and Mandor. The list of promising for all characters have been presented in table 116 and mean and range presented in table 117.

A set of 53 accessions including checks were evaluated for six quantitative characters at Faizabad. Genotype IC 415282 (19.00 q/plant) was observed highest yielder. The maximum plant height (146.00 cm) was observed in the accessions IC 415274 followed by IC 415466 (136.30 cm). The highest no. of branches was recorded in accession IC 415462 followed by IC 519548. The longest inflorescence (77.0 cm) was recorded in the genotype IC 415274 followed by IC 423400 (69.2 cm). The statistical parameter for all the characters have been given in table 117. Genotype IC 415252 (32.00 days) was earliest in flowering and IC 415387 (85. 00 days) was observed early maturing.

A total of 105 accessions were also evaluated at OAU&T, Bhubaneswar for seven quantitative characters. Statistical parameters have been given in table 117. Genotypes IC 415236 and IC 415266 (36 days) was earliest in flowering and IC 415318 (77 days) was earliest in maturity. The maximum plant height (136.98 cm) was observed in the check variety Annapurna. The longest panicle length was found in BGA-7 (63.8 cm) followed by BGA-26 (62.40 cm). The entry IC 415316 (9.12 g) followed by IC 415318 (8.86 g) had the highest test weight. The highest grain yield per plant was observed in genotype BGA-15 (22.4 g) followed by BGA-10 (22.00 g).

A set of 54 genotypes including four checks were screened for six yield related attributes at RAU, Mandor. Entries IC 415297 was found earlier to the check variety in flowering and maturity. The maximum height (171.0 cm) was found in the genotype EC 524457 followed by EC 519554 (155.00 cm). The check GA-2 had the longest inflorescence length (67.10 cm). The EC 519543 was superior to the check for yield per plant (41.0 g). The mean and range for all characters have been given in table 117.

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

Flowering time was the earliest at Mandor (39.44 days) followed by Faizabad (40.06 days), while it was moderate at Bhubaneswar. The entry IC 415387 showed early flowering (33.00 days) and maturity (90.33 days) in genotype IC 415297 as compared to checks based on the average over all the three locations.

The plant height was highest at Faizabad (87.67 cm) and lowest at Bhubaneswar (74.19 cm). Based on the average over the locations, the entry EC 524457 (142.57 cm) had the highest plant height followed by EC 514531 (134.23 cm).

The length of inflorescence of the entries was highest at Mandor (50.07 cm) and lowest at Faizabad (45.55 cm). Based on the average over three locations, the entry IC 415274 (65.25 cm) had longest inflorescence followed by IC 423400 (62.35 cm).

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

The test weight was at both the location. Based on the average over two locations. The genotype IC 415316 had the highest test weight (8.66 g).

3.2.2 Grain Amaranth (Kahrif 2005)

Germplam 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 only two locations. The checks used were Annapurna, GA1, GA2 and Suvarna. The list of promising for all characters have been presented in table 118 and the range and means in table 119.

At Bangalore, a set of 50 genotypes were evaluated for five quantitative characters. The genotype BGA-26 (76.60 cm) followed by BGA-06 (75.00 cm) had the maximum height. The longest inflorescence (32.30 cm) was recorded in the genotype BGA-26 followed by BGA-07 (31.00 cm). IC 423408 (25.00 days) was earliest in flowering and none entry was found superior to the check variety in seed yield per plant (g) and in maturity.

A total of 50 genotypes were also evaluated at Mettupalayam for seven yield attributes. BGA-26 (215.00 cm) was found tallest genotype. IC 415205 (31 days) was earliest in flowering. No. entry was found superior to check variety in maturity, panicle length and number of branching. Eleven qualitative characters were also recorded and the data presented in table 120.

At Rahuri, a set of 50 genotypes were sent to be evaluated. No results have been recorded.

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

Flowering time was the earliest at Mettupalayam (41.91 days) followed by Bangalore (43.74 days). The entry IC 415290 and IC 423408 showed early flowering (98.75 days) and no entry was superior in maturity as compared to checks based on the average over all the three locations.

The plant height was highest at Mettupalayam (149.81 cm) and quite lowest at Bangalore (47.74 cm). Based on the average over the locations, the entry BGA-04 (199.0 cm) had the highest plant height followed by BGA-08 (196.00 cm).

The length of inflorescence of the entries was highest at Bangalore (20.77 cm) and lowered at Mettupalayam (20.62 cm). Based on the average over two

locations, the entry BGA-26 (26.65 cm) had longest inflorescence followed by BGA-07 (26.60 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 Bhubaneshwar; 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 121 and statistical parameters for all the characters of different locations have been presented in table 122.

A total of 120 genotypes and four checks RBL-1, RBL-6, RBL-35 and RBL-50 were screened for 11 characters in Augmented Design at OUA&T Bubaneswar. The entries were statistically significant for ten characters out of the eleven characters. All the genotypes flowered in 46.00 – 70.00 days and matured in 84.00 - 104.00 days. The maximum plant height (111.0 cm) was observed in LRB 175 followed by BRB 08-1 (110.0 cm). The entries LRB 218 (4.60) and LRB 142 (4.20) had the highest number of branches per plant, while entry BRB 14-1 (43.0) had the highest number of pods per plant. The longest pod was recorded in genotype LRB 194 (10.0 cm) followed by LRB 290 (9.9 cm). The entry LRB 214 (7.66 g) had the maximum 100 seed weight followed by LRB 197 (7.66 g). The highest seed yield per plant (15.70 g) was recorded in the genotype BRB 20.

At Bangalore, a set of 100 genotypes were evaluated for six characters. The maximum plant height (34.5 cm) was observed in the genotype LRB 140 followed by LRB 135 (33.1 cm). The entries LRB 242 (3.0) and LRB 217 (2.5) had the highest number of branches per plant, while entry LRB 304 (10.6) had the maximum number of pods per plant. No entry was superior to check variety in maturity and flowering.

At Delhi, a set of 100 genotypes and four checks RBL-1, RBL-6, RBL-35 and RBL-50 were evaluated in Augmented Design for 11 characters. The entries of one character out of twelve characters (no. of branches per plant) was found significant. LRB 148 (74.00 days) was found to be early flowering. Entry LRB 290 had longer pod than the check. The longest was recorded in the genotype LRB 234 (10.60) followed by LRB 123 (10.50). The entries LRB 119 and LRB 279 (113 days) were earlier in maturity. Maximum plant height (188.00 cm) was observed in the genotype LRB 174 followed by LRB 170 (186.00 cm). The entry LRB 170 (6.00) had the highest number of branches per plant. The entry LRB 157 (33.50 g) had the highest seed yield per plant. Bold seed was recorded in the genotypes LRB 157 (8.28 g) and LRB 257 (8.26 g). Maximum number of pods was observed in LRB 265 (105.0) followed by LRB 258 (102.40), while LRB 141 (6.0) and DPRR-75 (5.4) had the higher number of pods per cluster.

A set of 100 accessions and three checks RBL-6, RBL-35 and RBL-50 were evaluated in Augmented Design for eight yield related attributes at PAU, Ludhiana. Four entries had flowered earlier than check at this centre. The maximum plant height (139.00 cm) was recorded in the genotype LRB 189 followed by LRB 172 (124.00 cm).

The entries LRB 123 (7.08 g) and LRB 131 (7.02 g) had the bold seeds, while LRB 273 (30.0 g/plant) was the top yielder genotype.

A set of 100 accessions and three checks were evaluated in Augmented Design for nine characters at MPKV, Rahuri. Entries LRB 148 and LRB 162 was earliest in flowering (41 days), while LRB 196 (84 days) had the earliest in maturity followed by LRB 248 (67 days). The maximum height (108.00 cm) was recorded in the genotypes LRB 120 followed by LRB 138 (107.00 cm). The entries LRB 131 (3.40) and LRB 162 (3.20) had the highest number of primary branches per plant. The bold seeds were observed in the genotypes LRB 279 (6.0), LRB 120 (5.6 g) and LRB 186 (5.9 g). The top yielder accessions were LRB 162 and LRB 139 (3.20 g/plant).

A total of 100 lines and three checks were screened for nine characters in Augmented Design at BAU Ranchi. The entries in two characters had statistically significant variation. Entries LRB 269 (45 days) was earliest in flowering and in

maturity LRB 248 (98.0 days). The maximum plant height (112.30 cm) was observed in LRB 283 followed by LRB 290 (104.60 cm). The genotypes LRB 137, LRB 131 (4.3) had the highest number of branches, while LRB 243 (29.6) and LRB 230 (29.0) had the highest number of pods per plant. The maximum number of seeds per pods was recorded in the genotype LRB 120 followed by LRB 297 and LRB 304. The longest pod (9.0 cm) was observed in the genotypes LRB 297, LRB 286. No entry was superior to check in test weight. The top yielder accession were LRB 168 (8.6 g) and LRB 123 (8.5 g).

A set of 100 accessions with three checks RBL-6, RBL-35 and RBL-50 were evaluated in Augmented Design for two characters at GAU, S.K. Nagar. Early flowering was observed in the genotypes LRB 195, LRB 270 (56.0 days).

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 (43.3 days) followed by Rahuri (45.50 days), while it was very late at Delhi (87.97 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 (76.40 days) followed by Rahuri (86.59 days). There was a difference of about 53 days between Bangalore and Delhi. Based on the average over seven locations the entry LRB 187 (84.30 days) was the earliest in maturity.

Mean plant height was highest at Delhi (142.62 cm) followed by Ludhiana (92.22 cm) and very low at Bangalore (25.00cm). Based on the average over the locations the entry LRB 228 (96.46 cm) and LRB 217 (92.98 cm) had the maximum plant height.

The number of primary branches was highest at Delhi (4.28) followed by Rahuri (2.64). Based on the average over the locations the entry LRB 217 (3.27) had the highest number of branches.

The grain yield per plant recorded at six locations showed that Bangalore centre had the highest coefficient of variation. The variation among the centres

was relatively very high. Based on average over the six location the entry LRB 241 (13.23 g) and LRB 189 (11.47 g) had the highest grain yield per plant.

The number of pods per plant was highest at Delhi (64.0) followed by Rahuri (21.86) and very low at Bangalore (2.7). Based on data over the locations the entry LRB 241 (41.27) had the highest number of pods per plant followed by LRB 236 (38.80).

The number of seeds per plant recorded at five locations revealed that it was highest at Delhi (8.68) followed by Ludhiana (7.08). LRB 241 (8.10) had highest number of seeds per plant on the basis of all locations.

The mean pod length was recorded in five locations. It was highest at Delhi (8.91 cm) followed by Bhubaneswar (8.37 cm). Based on the average over a locations the entry LRB 290 (8.39 cm) had the longest pod length.

100 seed weight was observed at five locations. It showed that highest seed weight was at Ludhiana (5.83 g) followed by Bhubaneswar (5.81 g). Based on average over locations, the entry LRB 266 (6.28 g) had the boldest seed.

3.2.4 Faba bean (*Vicia feba*)

Germpalsm screening nursery consisting of 50 accessions supplied by CCS HAU, Hisar was to be evaluated at three locations viz. Hisar, New Delhi and Faizabad. The results were received from all the locations. The checks used were PRT-12, PRT-7 and Vikrant and the list of promising genotypes of the two centres have been presented in table 123.

At CCS HAU, Hisar, a set of 238 including checks were evaluated for quantitative characters. The genotype Mutant (57.00 days) were earlier in flowering and maturity (138.00 days). Maximum plant height (145.30 cm) was observed in the genotype Mutant-2 followed by Mutant (132.0 cm). The entry Mutant-1 and Mutant-2 had the highest number of branches per plant, while Mutant-1 had the highest number of cluster per plant and pods per plant. The longest pod (7.8 cm) was recorded in Mutant-2 followed by HB 072 (7.2 cm). The entries HB 019 (92.0 g) and EC 329708 (43.2 g) had the highest 100 seed

weight while the genotype IC 366272 (300 g) had the highest seed yield per plant. The statistical parameters for all characters have been given in table 124.

A total of 145 genotypes including three checks were evaluated in Augmented Design at N.B.P.G.R., New Delhi for fifteen quantitative characters. Early flowering was observed (67.0 days) in the genotypes IC 361496 (67.0 days) and IC 361499 (71.0 days) whereas early maturity was observed (148.73 days) in the genotypes IC 361499 followed by IC 267648 (151.86 days). Highest pods per plant (81.4) was observed in the genotype JBT 42/RP-3/31 and EC 329725 (64.30). Maximum plant height (95.00 cm) was recorded in the genotype EC 243770 followed by IC 361470 (92.40 cm). The entries JBT 30/78 (17.0) and JBT 42/RP-3/31 (11.40) had the highest number of branches per plant, while entry JBT 30/78 had the highest number of grains per pod (4.0). The maximum seed yield (33.89 q/ha) was produced by the genotype EC 243770 followed by EC 117792 (33.89 q/ha). The boldest seed was recorded in the genotype EC 343808 (36.50 g) followed by EC 329679 (35.00 g). The means and ranges for various characters have been presented in table 125.

At Faizabad, a set of 113 including checks were evaluated for quantitative characters. The genotypes EC 267639 and EC 243756 (56.00 days) were earlier in flowering, while EC 329715 (153.0 days) and EC 243772 were earlier in maturity. Maximum plant height (74.8 cm) was observed in the genotype EC 329677 followed by EC 243596 (72.4 cm). The entries IC 332102 and EC 243525-A had the highest number of branches per plant and EC 117726 (60.8) pods per plant. The longest pod (5.2 cm) was recorded in EC 343631. The genotype EC 329696 (32.4 g) had the highest 100 seed weight while the genotype EC 299713 (28.70 q/ha) had the highest seed yield. The statistical parameters for all the characters have been given in table 126.

3.2.5 Kalingada

Germplasm screning nursery consisting of 54 genotypes syupplied 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 only one centre.

At GAU, S.K. Nagar, a set of 45 genotypes were evaluated for one character. Statistical parameters for all the characters have been presented in table 127 SKNK 006 is earliest in flowering (64.0 days).

3.2.6 Kankoda

Germplasm consisting of 90 accessions was evaluated at MPKV, Rahuri centre only. No check was used for screening the accessions. The list of promising genotypes for all the characters have been presented in table 128 and statistical parameters in table 129.

The entry PK-60 (12.4 cm) had the highest fruit girth followed by RK-14 (12.1 cm). The maximum number of fruit per plant was recorded in the genotypes PK-9 (224.00) and PK-12 (195.00). The biggest size of fruit was recorded in the genotype PK-12 (8.5 cm). The entries PK-12 (1.95 kg) and PK-20 (1.90 kg) had the maximum weight of plant (kg).

3.2.7 Jatropha

Jatropha accessions consisting of 13 genotypes was planned to be evaluated at six locations. The data have been received from only one centre viz. Hisar. The list of promising genotypes for various characters for various locations has been presented in table 130.

A set of 13 genotypes was evaluated at Hisar. The maximum plant height (220.00 cm) was recorded in the genotype JH-1. The entry JH-6 (19.0) had the highest number of branches followed by JH-1 (18.0). The highest stem girth was observed in the genotypes JH-1 (Table 131). The highest seed per plant were observed in JH-1 while longest size in genotype JH-1 (1.81 cm). Number of seed per plant (112.0) was observed in the genotype JH-1 (112.0).

A set of 22 genotypes were evaluated for semi-reclaimed soil at CSSRI Farm, Karnal for six yield attributes characters. The maximum number of branches (10.00) was recorded in the genotypes Hansraj and TNMC-19. The entry Cutting (89.67) had the highest number of fruits per plant followed by TNMC-23 (67.00). The longest fruit size (3.17 cm) was observed in the genotype TNMC-22 and followed by TNMC-5 (3.07). The highest seed yield and fruit yield

per plant were observed in Cutting. The entry Hansraj had the highest fruit size width (2.80 cm) (Table 132).

3.2.8 Simarouba

Simarouba genotypes were planned for maintaining the germplasm at six locations, but results were received from one centre. The list of promising genotypes for all the characters have been presented in table 133.

A set of 64 genotypes was maintained at Rahuri. The maximum plant height (4.00 m) was observed in the genotypes PS-6 followed by PS-9 (3.8 m). The entries PS-4 and PS-14 had the highest number of branches per plant. The highest stem girth (37.0 cm) was recorded in the genotypes PS-58 (Table 134).

Table 116. Promising lines in grain amaranth germplasm (Rabi, 2005-06) for various characters at different locations (Plains).

S.No.	Characters	Range	Promising lines	Highest value of best check
Faizabad (Accessions 50)				
1.	Days to 50% flowering	32.00-52.00	IC 415252, IC 415387, IC 415266, IC 415274, IC 415448, EC 519548, IC 415264, IC 415320, IC 415354, IC 415453 (< 36.00 days)	GA 1 (41.60 days)
2.	Days to maturity	84.00-104.00	IC 421885, IC 415466, EC 519557, IC 423398 (< 87.00 days)	GA 1 (97.36 days)
3.	Plant height (cm)	39.40-146.00	IC 415274, IC 415466 (> 136.00 cm)	GA 2 (127.85 cm)
4.	No. of primary branches per plant	1.00-10.80	IC 415462, EC 519548, IC 415264 (> 9.00)	GA 1 (7.63)
5.	Inflorescence length (cm)	31.40-77.00	IC 415274, IC 423400 (> 63.20 cm)	GA 2 (57.19 cm)
6.	Seed yield per plant (g)	2.00-19.00	IC 415282, EC 519527, IC 415331, IC 415290, IC 415236, IC 415387, IC 415448, IC 423410, IC 415243 (> 14.00 g)	GA 2 (9.90 g)
Bhubaneswar (Accessions 105)				
1.	Days to 50% flowering	36.00-61.00	IC 415236, IC 415266, IC 415268, IC 415318, IC 415330, IC 415243, IC 415250, IC 415254, IC 415258, IC 415271, IC 415282, IC 415284, IC 415290, IC 415331, IC 415387, IC 415453, IC 415462, IC 415466, IC 423548, EC 519512 (< 38.00 days)	Suvarna (41.20 days)
2.	Days to maturity	77.00-104.40	IC 415318, IC 415330, IC 415254, IC 415258, IC 415271, IC 415290, IC 415387, IC 415453, IC 415462, IC 415220, IC 415252, IC 415272, IC 415274, IC 415297, IC 415236, IC 415266, IC 415268, IC 415284, IC 415331, IC 415466, IC 423548, EC 519512, IC 415224, IC 415264, IC 415314, IC 415316, IC 423400, IC 423410, IC 423544, IC 415317, IC 423408 (< 79.00 days)	Suvarna (85.80 days)
3.	Plant height (cm)	39.60-136.98	No Accessions	Annapurna (136.98 cm)
4.	Panicle length (cm)	24.40-63.80	BGA 7, BGA 26, BGA 35, BGA 45, BGA 22, BGA 10, BGA 11, BGA 8, BGA 24, EC 519549 (> 60.00 cm)	GA 1(57.70 cm)
5.	Seed weight (g/10 ml)	6.88-9.12	IC 415316, IC 415318, IC 415266, IC 423400, EC 519554, BGA 18, IC 415252, BGA 25, IC 415224, IC 415236, IC 415272, IC 415466, IC 415258 (> 8.30 g/10 ml)	Suvarna (7.99 g/10 ml)

6.	Seed yield per plant (g)	6.00-22.40	BGA 15, BGA 10, BGA 22, BGA 7, BGA 6, EC 524497, BGA 9, BGA 20, EC 519548, BGA 11, BGA 12, EC 519549, BGA 14, IC 415266, BGA 26, EC 519532, EC 519554, BGA 13, BGA 47, BGA 37, EC 519517, EC 519522, IC 423548, EC 519543, BGA 19 (> 15.00 g)	Annapurna (10.74 g)
Mandor (Accessions 50)				
1.	Days to 50% flowering	27.00-64.00	IC 415297, IC 415466, IC 415290, IC 423548, IC 415387, IC 415320, IC 415462, IC 415271 (< 30.0 days)	Annapurna (32.40 days)
2.	Days to maturity	106.00-125.00	IC 415297, IC 415320, IC 415266, IC 415316, IC 415254 (< 109.0 days)	Annapurna (113.00 days)
3.	Plant height (cm)	41.00-170.50	EC 524457, EC 519554 (> 154.0 cm)	GA 1 (142.30 cm)
4.	Inflorescence length (cm)	31.00-67.10	No accession	GA 2 (67.10 cm)
5.	Grain yield per plant (g)	6.00-41.00	EC 519543, EC 519542, EC 524457 (> 37.0 g)	Suvarna (36.60 g)
6.	Seed weight (g/10 ml)	7.40-8.40	IC 415268, IC 415290, IC 415264, EC 519558, IC 423408 (> 8.20 g/10ml)	GA 1 (8.18 g/10ml)
Best entries over locations				
1.	Days to 50% flowering	33.00-56.67	IC 415387, IC 415320, IC 415252, IC 415266 ,IC 415297 (<34.00 days)	Annapurna (46.18 days)
2.	Days to maturity	90.33-107.67	IC 415297, IC 415254, IC 415466, IC 415282, IC 415320 (<93.00 days)	Suvarna (104.30 days)
3.	Plant height (cm)	42.33-142.57	EC 524457, EC 519531, EC 519554,EC 519542 (>131.93 cm)	G A 1 (129.62 cm)
4.	Inflorescence length (cm)	35.00-65.25	IC 415274, IC 423400 (>62.3 cm)	G A 2 (62.14 cm)
5.	Grain yield per plant (g)	7.53-22.31	No accessions	Suvarna(22.31 g)
6.	Seed weight (g/10 ml)	7.48-8.66	IC 415316, IC 415318, IC 423400, IC 415266, IC 415466, IC 415264, IC 415290, IC 415236, EC 519554, IC 415268 (>8.20 g/10ml)	G A 1 (8.04 g/10 ml)

Table 117. Multilocational evaluation of germplasm lines in grain amaranth at Faizabad, Bhubaneswar and Mandor - Rabi 2005-0

S.No.	Accession No.	Days to 50% flowering						Days to maturity			
		Faizabad	Bhubaneswar		Mandor	Mean		Faizabad	Bhubaneswar	Mandor	Mean
		Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.
1	EC 519512	51	37	35.75	36	41.33	35.75	102	78	112	97.33
2	EC 519517	48	55	53.75	61	54.67	53.75	95	101	121	105.67
3	EC 519522	52	55	53.75	63	56.67	53.75	90	101	121	104.00
4	EC 519526	51	51	49.75	63	55.00	49.75	88	94	121	101.00
5	EC 519527	43	54	52.75	37	44.67	52.75	100	101	117	106.00
6	EC 519531	47	56	54.75	63	55.33	54.75	97	102	121	106.67
7	EC 519532	40	56	54.75	59	51.67	54.75	97	102	124	107.67
8	EC 519542	42	53	51.75	63	52.67	51.75	99	101	117	105.67
9	EC 519543	38	49	48.75	64	50.33	48.75	97	94	117	102.67
10	EC 519548	35	48	47.75	37	40.00	47.75	90	91	121	100.67
11	EC 519549	40	50	49.75	39	43.00	49.75	88	94	121	101.00
12	EC 519554	42	50	49.75	63	51.67	49.75	89	91	119	99.67
13	EC 519558	42	56	55.75	39	45.67	55.75	97	101	119	105.67
14	EC 524457	41	57	56.75	63	53.67	56.75	85	101	121	102.33
15	IC 415220	42	38	37.75	35	38.33	37.75	95	77	109	93.67
16	IC 415224	39	38	37.75	33	36.67	37.75	93	78	114	95.00
17	IC 415236	38	36	35.75	31	35.00	35.75	95	78	114	95.67
18	IC 415243	40	37	36.75	35	37.33	36.75	96	79	114	96.33
19	IC 415250	38	37	36.75	31	35.33	36.75	94	79	114	95.67
20	IC 415252	32	38	37.75	30	33.33	37.75	88	77	117	94.00
21	IC 415254	41	37	36.75	35	37.67	36.75	89	77	107	91.00
22	IC 415258	42	37	36.75	32	37.00	36.75	90	77	114	93.67
23	IC 415264	35	38	37.75	30	34.33	37.75	97	78	114	96.33
24	IC 415266	34	36	35.75	30	33.33	35.75	94	78	107	93.00
25	IC 415268	36	36	35.75	35	35.67	35.75	99	78	117	98.00
26	IC 415271	41	37	36.75	29	35.67	36.75	96	77	111	94.67
27	IC 415272	41	38	37.75	30	36.33	37.75	94	77	114	95.00

Table 117. Multilocational)6 (Plains)

S.No.	Accession No.	Plant height (cm)						Inflorescence length (cm)		
		Faizabad		Bhubaneswar	Mandor	Mean		Faizabad	Mandor	Mean
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
1	EC 519512	69.00	103.50	61.20	56.50	62.23	103.50	47.00	49.50	48.25
2	EC 519517	113.80	148.30	128.80	120.50	121.03	148.30	35.00	41.00	38.00
3	EC 519522	124.40	158.90	131.40	140.00	131.93	158.90	36.20	41.00	38.60
4	EC 519526	103.80	138.30	123.80	143.50	123.70	138.30	36.40	55.00	45.70
5	EC 519527	84.40	118.90	74.60	96.50	85.17	118.90	47.00	61.50	54.25
6	EC 519531	119.40	89.14	129.80	153.50	134.23	89.14	35.20	48.00	41.60
7	EC 519532	136.00	105.74	107.00	138.00	127.00	105.74	44.20	50.50	47.35
8	EC 519542	123.00	92.74	126.00	147.00	132.00	92.74	41.80	56.00	48.90
9	EC 519543	117.33	87.07	106.00	151.50	124.94	87.07	43.60	54.50	49.05
10	EC 519548	72.00	41.74	68.60	98.50	79.70	41.74	31.40	58.00	44.70
11	EC 519549	97.40	79.24	74.00	88.00	86.47	79.24	47.40	53.00	50.20
12	EC 519554	113.80	95.64	132.00	154.50	133.43	95.64	36.60	52.50	44.55
13	EC 519558	97.80	79.64	77.40	76.50	83.90	79.64	35.80	48.50	42.15
14	EC 524457	124.80	106.64	132.40	170.50	142.57	106.64	39.00	66.00	52.50
15	IC 415220	74.60	79.64	47.20	41.00	54.27	79.64	39.00	31.00	35.00
16	IC 415224	71.20	76.24	54.40	50.50	58.70	76.24	40.80	46.00	43.40
17	IC 415236	48.66	53.70	61.60	58.50	56.25	53.70	46.33	52.00	49.17
18	IC 415243	78.80	83.84	57.40	59.00	65.07	83.84	39.00	51.00	45.00
19	IC 415250	66.20	71.24	54.80	50.50	57.17	71.24	45.40	40.50	42.95
20	IC 415252	69.60	76.04	54.80	65.50	63.30	76.04	54.40	55.50	54.95
21	IC 415254	64.30	70.74	48.00	61.50	57.93	70.74	45.66	55.00	50.33
22	IC 415258	71.00	77.44	46.40	55.00	57.47	77.44	49.60	47.00	48.30
23	IC 415264	77.20	83.64	53.60	65.00	65.27	83.64	49.40	53.50	51.45
24	IC 415266	77.60	84.04	66.20	65.50	69.77	84.04	52.60	54.50	53.55
25	IC 415268	80.40	86.50	58.80	73.50	70.90	86.50	49.80	61.50	55.65
26	IC 415271	59.60	65.70	47.60	58.50	55.23	65.70	41.80	48.00	44.90
27	IC 415272	77.40	83.50	53.80	72.50	67.90	83.50	47.20	60.00	53.60

Table 117. Multilocational

S.No.	Accession No.	Grain yield per plant (g)				Seed weight (g/10 ml)			No. of branches/plant	Panicle length (cm)
		Faizabad	Bhubaneswar	Mandor	Mean	Bhubaneswar	Mandor	Mean	Faizabad	Bhubaneswar
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
1	EC 519512	11.00	12.00	9.00	10.67	7.88	8.10	7.99	5. 0	50.00
2	EC 519517	2.00	15.60	32.00	16.53	8.09	8.00	8.05	-	51.80
3	EC 519522	5.00	15.40	27.00	15.80	7.39	7.60	7.50	-	52.40
4	EC 519526	9.00	14.80	37.00	20.27	8.03	7.40	7.72	-	41.60
5	EC 519527	18.00	14.40	25.00	19.13	7.61	7.90	7.76	2.60	36.00
6	EC 519531	8.00	15.00	29.00	17.33	7.40	7.60	7.50	-	50.80
7	EC 519532	14.00	16.20	25.00	18.40	7.56	7.40	7.48	7.00	56.80
8	EC 519542	11.00	11.60	39.00	20.53	7.60	7.80	7.70	-	42.60
9	EC 519543	7.00	15.20	41.00	21.07	7.49	8.00	7.75	7.30	55.80
10	EC 519548	10.00	17.60	23.00	16.87	7.38	7.90	7.64	10.60	51.80
11	EC 519549	11.00	16.50	10.00	12.50	7.70	8.20	7.95	7.00	60.40
12	EC 519554	10.00	16.00	34.00	20.00	8.45	8.00	8.23	-	59.40
13	EC 519558	6.00	12.00	18.00	12.00	7.71	8.40	8.06	6.80	48.40
14	EC 524457	3.00	18.40	38.00	19.80	8.01	7.70	7.86	-	50.40
15	IC 415220	14.00	7.50	13.00	11.50	8.03	7.80	7.92	6.00	29.40
16	IC 415224	14.00	11.80	15.00	13.60	8.37	7.70	8.04	7.60	34.00
17	IC 415236	16.00	7.80	19.00	14.27	8.36	8.10	8.23	3.00	34.40
18	IC 415243	15.00	6.80	15.00	12.27	7.93	7.90	7.92	5.20	34.00
19	IC 415250	14.00	10.00	14.00	12.67	7.83	7.90	7.87	6.00	31.40
20	IC 415252	6.00	7.60	23.00	12.20	8.40	8.00	8.20	6.20	33.00
21	IC 415254	6.00	7.80	25.00	12.93	7.84	7.70	7.77	7.00	29.80
22	IC 415258	14.00	6.00	13.00	11.00	8.32	7.60	7.96	5.60	28.80
23	IC 415264	12.00	6.40	21.00	13.13	8.12	8.40	8.26	9.60	31.20
24	IC 415266	10.00	16.40	21.00	15.80	8.59	8.10	8.35	5.80	36.40
25	IC 415268	8.00	6.40	14.00	9.47	8.04	8.40	8.22	5.80	31.40
26	IC 415271	14.00	8.40	11.00	11.13	8.08	7.80	7.94	5.00	28.60
27	IC 415272	13.00	9.50	24.00	15.50	8.34	8.00	8.17	5.60	34.00

S.No.	Accession No.	Days to 50% flowering						Days to maturity			
		Faizabad	Bhubaneswar		Mandor	Mean		Faizabad	Bhubaneswar	Mandor	Mean
		Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.
28	IC 415274	34	38	37.75	30	34.00	37.75	98	77	114	96.33
29	IC 415282	42	37	36.75	30	36.33	36.75	88	79	109	92.00
30	IC 415284	38	37	37.00	36	37.00	37.00	87	78	114	93.00
31	IC 415290	37	37	37.00	28	34.00	37.00	104	77	117	99.33
32	IC 415297	36	38	38.00	27	33.67	38.00	88	77	106	90.33
33	IC 415314	35	38	38.00	31	34.67	38.00	95	78	115	96.00
34	IC 415316	40	38	38.00	32	36.67	38.00	94	78	107	93.00
35	IC 415317	41	39	39.00	37	39.00	39.00	96	78	117	97.00
36	IC 415318	38	36	36.00	37	37.00	36.00	95	77	117	96.33
37	IC 415320	35	36	36.00	29	33.33	36.00	93	77	107	92.33
38	IC 415331	37	37	37.00	30	34.67	37.00	89	78	114	93.67
39	IC 415387	33	37	37.00	29	33.00	37.00	90	77	115	94.00
40	IC 415448	34	38	38.00	32	34.67	38.00	92	79	112	94.33
41	IC 415453	35	37	37.00	32	34.67	37.00	96	77	111	94.67
42	IC 415462	38	37	37.00	29	34.67	37.00	88	77	114	93.00
43	IC 415466	40	37	37.00	28	35.00	37.00	85	78	111	91.33
44	IC 421885	41	42	42.00	37	40.00	42.00	84	85	115	94.67
45	IC 423398	42	44	44.00	33	39.67	44.00	85	85	117	95.67
46	IC 423400	36	38	38.00	61	45.00	38.00	94	78	125	99.00
47	IC 423408	40	39	39.00	37	38.67	39.00	96	78	111	95.00
48	IC 423410	45	38	38.00	37	40.00	38.00	91	78	119	96.00
49	IC 423544	44	38	38.00	34	38.67	38.00	92	78	117	95.67
50	IC 423548	41	37	37.00	28	35.33	37.00	93	78	111	94.00
Means for check varieties											
	Annapurna (c)	**45.14**	61.00	-	32.40	46.18	-	**100.26**	104.40	113.00	105.89
	G A 1(c)	**41.60**	55.60	-	52.40	49.87	-	**97.36**	99.00	122.40	106.25
	G A 2 (c)	**43.62**	59.20	-	52.20	51.67	-	**99.06**	101.20	122.40	107.55
	Suvarna	**-**	41.20	-	63.00	52.10	-	**-**	85.80	122.80	104.30

S.No.	Accession No.	Plant height (cm)						Inflorescence length (cm)		
		Faizabad		Bhubaneswar	Mandor	Mean		Faizabad	Mandor	Mean
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
28	IC 415274	146.00	152.10	55.80	60.50	87.43	152.10	77.00	53.50	65.25
29	IC 415282	77.00	83.10	52.20	57.50	62.23	83.10	35.40	41.50	38.45
30	IC 415284	73.60	72.30	56.80	59.50	63.30	72.30	41.00	49.00	45.00
31	IC 415290	83.50	82.20	64.00	74.50	74.00	82.20	50.50	59.50	55.00
32	IC 415297	78.00	76.70	62.20	64.50	68.23	76.70	54.00	52.00	53.00
33	IC 415314	76.00	53.94	54.20	49.50	59.90	53.94	43.20	41.00	42.10
34	IC 415316	76.40	58.24	63.20	65.00	68.20	58.24	56.20	53.00	54.60
35	IC 415317	93.20	91.90	62.20	48.50	67.97	91.90	55.20	40.00	47.60
36	IC 415318	70.00	68.70	61.20	50.50	60.57	68.70	49.20	41.00	45.10
37	IC 415320	83.40	61.34	56.40	59.50	66.43	61.34	63.20	51.50	57.35
38	IC 415331	93.80	71.74	57.00	61.50	70.77	71.74	37.60	51.50	44.55
39	IC 415387	77.00	54.94	52.20	62.50	63.90	54.94	40.60	51.00	45.80
40	IC 415448	89.00	66.94	61.60	55.50	68.70	66.94	52.00	45.00	48.50
41	IC 415453	69.40	88.77	61.40	50.50	60.43	88.77	31.60	42.00	36.80
42	IC 415462	71.20	90.57	57.60	46.00	58.27	90.57	41.80	38.00	39.90
43	IC 415466	136.30	155.67	58.00	66.50	86.93	155.67	52.00	56.00	54.00
44	IC 421885	39.40	58.77	39.60	48.00	42.33	58.77	32.00	39.50	35.75
45	IC 423398	56.00	75.37	55.20	48.50	53.23	75.37	36.20	42.00	39.10
46	IC 423400	88.60	88.94	109.20	140.50	112.77	88.94	69.20	55.50	62.35
47	IC 423408	82.80	83.14	61.20	56.00	66.67	83.14	51.80	48.50	50.15
48	IC 423410	81.20	81.54	53.80	57.00	64.00	81.54	42.60	49.50	46.05
49	IC 423544	71.80	72.14	71.80	53.00	65.53	72.14	49.60	48.50	49.05
50	IC 423548	77.80	78.14	65.80	59.00	67.53	78.14	52.80	48.50	50.65
Means for check varieties										
	Annapurna (c)	**87.13**	**-**	136.98	43.60	89.24	-	**45.95**	37.80	41.87
	G A 1(c)	**126.53**	**-**	120.02	142.30	129.62	-	**38.48**	64.70	51.59
	G A 2 (c)	**127.85**	**-**	121.38	135.50	128.24	-	**57.19**	67.10	62.14
	Suvarna	**-**	**-**	57.62	134.30	95.96	-	**-**	46.30	46.30

S.No.	Accession No.	Grain yield per plant (g)				Seed weight (g/10 ml)			No. of branches/plant	Panicle length (cm)
		Faizabad	Bhubaneswar	Mandor	Mean	Bhubaneswar	Mandor	Mean	Faizabad	Bhubaneswar
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
28	IC 415274	9.00	7.60	13.00	9.87	8.19	8.20	8.20	1.00	33.40
29	IC 415282	**19.00**	8.80	16.00	14.60	7.99	7.60	7.80	6.20	35.60
30	IC 415284	8.00	10.00	14.00	10.67	8.12	8.20	8.16	9.00	40.80
31	IC 415290	16.00	10.40	18.00	14.80	8.09	8.40	8.25	4.00	39.40
32	IC 415297	5.00	8.80	20.00	11.27	8.11	7.90	8.01	6.40	39.40
33	IC 415314	7.00	9.20	8.50	8.23	7.99	8.00	8.00	6.20	32.20
34	IC 415316	11.00	7.00	24.00	14.00	9.12	8.20	8.66	5.00	42.40
35	IC 415317	10.00	9.60	8.00	9.20	7.99	8.20	8.10	7.20	41.60
36	IC 415318	6.00	12.00	13.00	10.33	8.86	8.20	8.53	4.80	40.80
37	IC 415320	8.00	6.40	17.00	10.47	7.93	8.10	8.02	5.40	38.40
38	IC 415331	**17.00**	7.20	12.00	12.07	8.25	8.00	8.13	5.60	37.60
39	IC 415387	16.00	12.20	22.00	16.73	7.92	7.90	7.91	6.00	46.00
40	IC 415448	15.00	10.80	15.00	13.60	7.78	8.00	7.89	7.80	40.20
41	IC 415453	10.00	12.80	15.00	12.60	7.78	7.80	7.79	4.80	40.60
42	IC 415462	8.00	14.00	16.00	12.67	8.06	8.00	8.03	10.80	53.00
43	IC 415466	6.00	8.00	23.00	12.33	8.34	8.20	8.27	7.30	39.80
44	IC 421885	7.00	7.00	23.00	12.33	7.92	8.20	8.06	4.40	26.40
45	IC 423398	11.00	14.50	17.00	14.17	7.81	8.00	7.91	4.60	58.40
46	IC 423400	8.00	10.00	20.00	12.67	8.50	8.20	8.35	4.40	56.40
47	IC 423408	12.00	12.40	7.50	10.63	7.74	8.40	8.07	7.20	44.20
48	IC 423410	15.00	7.20	13.00	11.73	7.54	8.20	7.87	4.80	39.20
49	IC 423544	5.00	11.60	6.00	7.53	8.23	8.00	8.12	5.00	52.40
50	IC 423548	11.00	15.20	14.50	13.57	7.75	7.90	7.83	3.80	58.20
Means for check varieties										
	Annapurna (c)	**9.46**	10.74	7.20	9.13	7.66	7.84	7.75	**5.92**	49.08
	G A 1(c)	**5.96**	9.84	32.00	15.93	7.90	8.18	8.04	**7.63**	57.70
	G A 2 (c)	**9.90**	8.74	35.00	17.88	7.22	8.04	7.63	**7.05**	53.24
	Suvarna	**-**	8.02	36.60	22.31	7.99	7.94	7.97	**-**	36.56

S.No.	Accession No.	Days to 50% flowering						Days to maturity			
		Faizabad	Bhubaneswar		Mandor	Mean		Faizabad	Bhubaneswar	Mandor	Mean
		Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.
	Minimum	32.00	36.00	-	27.00	33.00	-	84.00	77.00	106.00	90.33
	Maximum	52.00	61.00	-	64.00	56.67	-	104.00	104.40	125.00	107.67
	Mean	40.06	42.59	-	39.44	40.77	-	93.28	84.34	115.44	97.75
	CD (0.05)	17.03	2.15	-	3.05	-	-	12.21	2.25	4.59	-
	CV (%) Error	15.41	1.49	-	2.29	-	-	4.85	0.86	1.43	-
	CV (%) Phenotypic	11.28	18.58	-	32.07	17.99	-	5.04	11.65	4.13	5.10

S.No.	Accession No.	Plant height (cm)						Inflorescence length (cm)		
		Faizabad		Bhubaneswar	Mandor	Mean		Faizabad	Mandor	Mean
		Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
	Minimum	39.40	-	39.60	41.00	42.33	-	31.40	31.00	35.00
	Maximum	146.00	-	136.98	170.50	142.57	-	77.00	67.10	65.25
	Mean	87.67	-	74.19	80.76	80.92	-	45.55	50.07	47.82
	CD (0.05)	51.66	-	15.72	11.45	-	-	38.90	13.38	-
	CV (%) Error	17.85	-	5.40	3.76	-	-	32.40	9.29	-
	CV (%) Phenotypic	27.34	-	39.40	47.07	34.26	-	20.19	15.35	14.00

S.No.	Accession No.	Grain yield per plant (g)				Seed weight (g/10 ml)			No. of branches/plant	Panicle length (cm)
		Faizabad	Bhubaneswar	Mandor	Mean	Bhubaneswar	Mandor	Mean	Faizabad	Bhubaneswar
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
	Minimum	2.00	6.00	6.00	7.53	7.22	7.40	7.48	1.00	26.40
	Maximum	19.00	18.40	41.00	22.31	9.12	8.40	8.66	10.80	60.40
	Mean	10.31	10.98	20.02	13.85	7.99	7.99	7.99	6.04	42.55
	CD (0.05)	9.54	1.14	9.82	-	1.90	0.23	-	5.12	12.61
	CV (%) Error	44.43	4.56	13.28	-	9.25	1.08	-	29.33	9.61
	CV (%) Phenotypic	38.73	31.50	45.39	25.55	4.59	3.05	3.06	31.17	22.72

Table 118. Promising lines in grain amaranths germplasm (Kharif, 2006) for different characters at various locations (Plains).

S.No.	Characters	Range	Promising lines	Highest value of best check
Banglore (Accessions 50)				
1.	Days to 50% flowering	24.50-61.50	IC-423408, IC-415290 (< 26.00 days)	Annapurna (26.00 days)
2.	Days to maturity	55.00-93.00	No Accessions	Annapurna (55.00 days)
3.	Plant height (cm)	20.50-76.60	BGA-26, BGA-06, BGA-23, BGA-18, BGA-12 (> 68.00 cm)	GA-2 (64.00 cm)
4.	Panicle length (cm)	11.20-32.30	BGA-26, BGA-07, BGA-23, BGA-11, IC-415222, IC-423408, IC-415264, IC-415290, IC-415266 (> 25.00 cm)	Annapurna (22.00 cm)
5.	Seed yield per plant (g)	0.30-21.00	No Accessions	GA-2 (21.00 g)
Mettupalayam (Accessions 50)				
1.	Days to 50% flowering	31.00-55.00	IC 415252, IC 038312, IC415232, IC 415258, IC 415262, IC 415290, IC 415264, IC 415272 (< 33.00 days)	Annapurna (36.00 days)
2.	Days to maturity	82.00-91.00	No Accessions	GA-1 (82.00 days)
3.	Plant height (cm)	80.00-215.00	BGA-26 (> 212.00 cm)	GA-2 (210.00 cm)
4.	Inflorescence length (cm)	33.00-80.00	No Accessions	GA-2 (80.00 cm)
5.	Leaf length (cm)	15.00-24.20	No Accessions	Suvarna (24.20 cm)
6.	Stem thickness (cm)	1.50-3.98	No Accessions	Suvarna (3.98 cm)
7.	No. of primary branches per plant	2.00-5.00	BGA-23 (= 5.00)	GA-1 (5.00)
8.	1000 seed weight (g)	0.20-0.70	IC 038312 (= 0.70 g)	Suvarna (0.70 g)
9.	Seed yield per plant (g)	5.00-25.00	No Accessions	Suvarna (25.00 g)

Best entries over locations				
1.	Plant height (cm)	61.85-199.00	BGA-04, BGA-08 (>168.00 cm)	Suvarna (160.00 cm)
2.	Days to Flowering	28.75-57.75	IC415290, IC423408 (<30.00 days)	Annapurna (31.00 days)
3.	Days to maturity	71.00-91.00	No accessions	Annapurna (71.00 days)
4.	Seed yield per plant (g)	3.20-25.00	No accessions	Suvarna (25.00 g)
5.	Panicle length (cm)	16.45-26.65	BGA-26, BGA-07, BGA-11, IC415222 (>24.95 cm)	Suvarna (24.20 cm)

Table 119. Multilocational evaluation of germplasm lines in grain amaranth at Bangalore and Mettupalayam - Kharif 2006 (Plains)

Sl. No.	Accession No.	Plant height (cm)			Days to Flowering			Days to maturity			Seed yield per plant (g)		
		Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean
1	BGA-01	61.00	166.00	113.50	50	44	47.00	87	85	85.75	3.70	20.50	12.10
2	BGA-03	49.00	210.00	129.50	45	46	45.50	83	84	83.50	1.10	21.30	11.20
3	BGA-04	-	199.00	199.00	-	46	46.00	-	86	86.00	-	18.40	18.40
4	BGA-05	50.50	180.00	115.25	46	47	46.25	86	87	86.25	2.70	21.50	12.10
5	BGA-06	75.00	200.00	137.50	57	48	52.50	92	84	88.00	4.70	19.50	12.10
6	BGA-07	57.00	198.00	127.50	56	48	52.00	87	85	86.00	5.10	18.50	11.80
7	BGA-08	-	196.00	196.00	-	48	48.00	-	84	84.00	-	16.30	16.30
8	BGA-09	-	150.00	150.00	-	55	55.00	-	87	87.00	-	18.30	18.30
9	BGA-11	68.00	157.00	112.50	51	47	49.00	88	86	86.75	2.10	17.90	10.00
10	BGA-12	68.50	133.00	100.75	45	48	46.50	82	83	82.50	4.40	17.60	11.00
11	BGA-13	-	168.00	168.00	-	46	46.00	-	89	89.00	-	14.30	14.30
12	BGA-14	43.50	154.00	98.75	47	48	47.50	88	88	87.75	0.70	8.90	4.80
13	BGA-16	34.40	162.00	98.20	58	47	52.25	88	90	88.75	1.10	9.50	5.30
14	BGA-17	56.40	152.00	104.20	44	48	46.00	83	90	86.50	1.70	10.30	6.00
15	BGA-18	68.60	133.00	100.80	44	46	45.00	93	88	90.50	2.10	12.10	7.10
16	BGA-19	31.80	138.00	84.90	37	46	41.50	88	89	88.50	2.00	13.10	7.55
17	BGA-20	44.50	181.00	112.75	57	48	52.50	88	89	88.50	1.33	14.10	7.72
18	BGA-21	45.60	186.00	115.80	45	47	46.00	82	85	83.50	2.00	18.50	10.25
19	BGA-22	41.80	192.00	116.90	41	45	43.00	87	86	86.50	1.28	17.60	9.44
20	BGA-23	69.90	190.00	129.95	49	48	48.25	89	87	88.00	2.07	16.80	9.44
21	BGA-24	62.60	172.00	117.30	44	45	44.50	93	88	90.50	2.00	15.40	8.70
22	BGA-25	43.60	171.00	107.30	57	45	51.00	91	88	89.50	1.45	16.30	8.88
23	BGA-26	76.60	215.00	145.80	45	46	45.50	83	88	85.50	0.80	17.50	9.15
24	BGA-27	51.80	205.00	128.40	62	54	57.75	88	89	88.25	2.45	18.30	10.38
25	BGA-28	48.00	184.00	116.00	57	46	51.50	87	90	88.50	3.70	18.90	11.30
26	EC519522	49.10	177.00	113.05	44	47	45.25	88	91	89.25	1.02	17.40	9.21
27	EC519526	43.90	152.00	97.95	44	47	45.50	86	90	88.00	1.01	19.20	10.11
28	EC519544	41.80	166.00	103.90	52	47	49.25	91	88	89.50	1.65	17.50	9.58

Table 119. Multilocational e

Sl. No.	Accession No.	Panicle length (cm)			Mettupalayam			
		Bangalore	Mettupalayam	Mean	Stem thickness (cm)	No of branches per plant	Inflorescense length (cm)	1000 Seed weight (g)
1	BGA-01	23.30	20.10	21.70	2.56	2	76.00	0.65
2	BGA-03	19.00	19.80	19.40	2.58	3	69.00	0.64
3	BGA-04	-	21.20	21.20	2.68	2	69.00	0.63
4	BGA-05	20.80	20.10	20.45	2.70	3	39.00	0.65
5	BGA-06	25.00	21.20	23.10	2.71	3	39.00	0.66
6	BGA-07	31.00	22.20	26.60	2.80	3	49.00	0.63
7	BGA-08	-	21.30	21.30	2.65	3	62.00	0.60
8	BGA-09	-	20.50	20.50	2.71	2	35.00	0.67
9	BGA-11	29.60	22.40	26.00	2.66	3	46.00	0.70
10	BGA-12	24.00	20.60	22.30	2.79	3	55.00	0.58
11	BGA-13	-	22.10	22.10	2.81	3	69.00	0.63
12	BGA-14	20.10	20.30	20.20	2.80	3	52.00	0.62
13	BGA-16	12.00	21.30	16.65	2.81	3	47.00	0.61
14	BGA-17	23.80	22.10	22.95	2.81	3	62.00	0.62
15	BGA-18	25.00	22.40	23.70	2.84	3	72.00	0.63
16	BGA-19	20.60	22.80	21.70	2.85	3	60.00	0.64
17	BGA-20	19.40	22.60	21.00	2.86	3	43.00	0.60
18	BGA-21	23.80	21.80	22.80	2.90	3	48.00	0.65
19	BGA-22	14.20	19.90	17.05	2.95	3	51.00	0.60
20	BGA-23	29.80	20.10	24.95	2.90	5	65.00	0.59
21	BGA-24	24.20	22.10	23.15	3.01	3	58.00	0.57
22	BGA-25	17.20	23.00	20.10	2.80	4	65.00	0.58
23	BGA-26	32.30	21.00	26.65	2.59	3	76.00	0.59
24	BGA-27	21.20	21.80	21.50	2.81	3	74.00	0.60
25	BGA-28	15.50	20.00	17.75	2.83	3	78.00	0.62
26	EC519522	15.50	21.20	18.35	2.75	3	35.00	0.63
27	EC519526	18.00	18.60	18.30	2.95	3	44.00	0.64
28	EC519544	18.00	19.50	18.75	2.91	3	33.00	0.59

Sl. No.	Accession No.	Plant height (cm)			Days to Flowering			Days to maturity			Seed yield per plant (g)		
		Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean	Bangalore	Mettupalayam	Mean
29	EC519549	55.80	132.00	93.90	37	36	36.25	88	89	88.25	1.00	18.40	9.70
30	EC519554	53.00	180.00	116.50	45	47	46.00	92	89	90.50	1.40	17.30	9.35
31	IC037316	20.50	143.00	81.75	44	36	39.75	84	83	83.50	0.94	8.90	4.92
32	IC038127	28.80	120.00	74.40	41	35	38.00	82	85	83.25	0.81	9.70	5.26
33	IC038312	33.20	95.00	64.10	39	32	35.50	82	86	83.75	0.71	9.80	5.26
34	IC042311-7	26.60	131.00	78.80	44	34	39.00	85	88	86.25	0.79	10.00	5.40
35	IC415222	32.00	132.00	82.00	41	33	37.00	80	87	83.50	1.60	11.20	6.40
36	IC415232	34.00	130.00	82.00	40	32	36.00	80	87	83.50	0.84	9.80	5.32
37	IC415252	23.50	125.00	74.25	45	31	38.00	82	85	83.50	0.85	9.70	5.28
38	IC415258	27.10	96.60	61.85	41	32	36.25	84	86	84.75	0.51	8.60	4.56
39	IC415262	37.40	108.00	72.70	39	32	35.50	81	89	85.00	0.92	8.40	4.66
40	IC415264	64.00	107.60	85.80	45	32	38.50	90	88	88.75	3.60	7.90	5.75
41	IC415266	50.30	112.60	81.45	30	33	31.25	61	86	73.50	1.00	12.30	6.65
42	IC415272	26.80	109.50	68.15	49	32	40.50	84	88	85.75	0.80	14.50	7.65
43	IC415282	40.00	102.80	71.40	41	33	37.00	83	85	84.00	0.30	13.60	6.95
44	IC415290	60.00	116.61	88.31	26	32	28.75	60	88	74.00	1.25	14.20	7.73
45	IC415297	27.40	106.00	66.70	39	33	36.00	76	88	82.00	0.42	15.30	7.86
46	IC415318	33.20	115.20	74.20	35	33	34.00	88	89	88.50	0.48	14.10	7.29
47	IC415426	42.70	106.60	74.65	38	36	36.75	90	87	88.50	0.63	12.30	6.47
48	IC415448	55.60	105.60	80.60	32	35	33.25	63	86	74.25	0.89	13.20	7.05
49	IC423408	59.60	94.60	77.10	25	35	29.75	60	88	74.00	1.25	12.10	6.68
50	IC423448	48.10	80.00	64.05	57	-	56.50	92	90	91.00	1.39	5.00	3.20
Means for check varieties													
	Annapurna	50.60	107.80	79.20	26	36	31.00	55	87	71.00	1.60	15.00	8.30
	GA-1	61.80	175.00	118.40	35	48	41.50	75	82	78.50	1.00	15.40	8.20
	GA-2	64.00	210.00	137.00	40	47	43.50	85	87	86.00	21.00	17.40	19.20
	Suvarna	-	160.00	160.00	-	53	53.00	-	90	90.00	-	25.00	25.00
	Minimum	**20.50**	**80.00**	**61.85**	**24.50**	**31.00**	**28.75**	**55.00**	**82.00**	**71.00**	**0.30**	**5.00**	**3.20**
	Maximum	**76.60**	**215.00**	**199.00**	**61.50**	**55.00**	**57.75**	**93.00**	**91.00**	**91.00**	**21.00**	**25.00**	**25.00**
	Mean	**47.73**	**149.81**	**104.64**	**43.74**	**41.91**	**43.23**	**83.11**	**87.17**	**85.33**	**2.00**	**14.71**	**9.12**
	CV (%) Phenotypic	**30.46**	**24.61**	**30.37**	**19.64**	**17.22**	**16.64**	**10.80**	**2.38**	**5.45**	**149.45**	**28.67**	**45.93**

Sl. No.	Accession No.	Panicle length (cm)			Mettupalayam			
		Bangalore	Mettupalayam	Mean	Stem thickness (cm)	No of branches per plant	Inflorescense length (cm)	1000 Seed weight (g)
29	EC519549	24.80	19.80	22.30	2.85	4	53.00	0.58
30	EC519554	20.20	19.90	20.05	2.96	3	40.00	0.59
31	IC037316	11.20	22.10	16.65	2.90	3	55.00	0.61
32	IC038127	14.80	20.00	17.40	3.10	3	59.00	0.42
33	IC038312	17.60	21.00	19.30	3.11	3	52.20	50.00
34	IC042311-7	16.60	20.80	18.70	3.23	3	57.20	0.51
35	IC415222	29.20	21.10	25.15	3.54	3	56.00	0.49
36	IC415232	16.80	20.50	18.65	2.95	4	57.00	0.45
37	IC415252	13.50	19.50	16.50	2.67	3	65.80	0.48
38	IC415258	13.30	19.60	16.45	2.69	3	47.00	0.50
39	IC415262	18.60	19.50	19.05	2.78	4	50.80	0.52
40	IC415264	27.00	19.20	23.10	2.87	4	50.20	0.48
41	IC415266	25.60	18.50	22.05	2.96	3	55.20	0.48
42	IC415272	15.20	18.60	16.90	2.57	3	55.00	0.47
43	IC415282	20.20	18.40	19.30	2.68	5	52.00	0.46
44	IC415290	25.60	19.50	22.55	2.73	3	61.80	0.60
45	IC415297	15.20	19.60	17.40	2.77	2	54.20	0.55
46	IC415318	19.80	19.80	19.80	2.81	2	59.60	0.52
47	IC415426	21.10	20.10	20.60	2.80	3	54.00	0.51
48	IC415448	22.00	20.20	21.10	2.80	3	50.20	0.52
49	IC423408	29.00	19.10	24.05	2.79	3	48.00	0.52
50	IC423448	17.90	15.00	16.45	1.50	2	50.00	0.20
Means for check varieties								
	Annapurna	22.00	19.00	20.50	2.69	4	47.60	0.49
	GA-1	18.60	23.10	20.85	2.78	5	65.00	0.54
	GA-2	18.80	23.20	21.00	2.95	3	80.00	0.55
	Suvarna	-	24.20	24.20	3.98	3	51.00	0.70
	Minimum	**11.20**	**15.00**	**16.45**	**1.50**	**2.00**	**33.00**	**0.20**
	Maximum	**32.30**	**24.20**	**26.65**	**3.98**	**5.00**	**80.00**	**50.00**
	Mean	**20.77**	**20.62**	**20.75**	**2.82**	**3.11**	**55.51**	**1.48**
	CV (%) Phenotypic	**25.02**	**7.63**	**13.07**	**10.39**	**21.33**	**20.31**	**453.18**

Table 120. Characterization of germplasm lines in grain amaranth at Mettupalayam - 2006 (Plains)

S.No.	Accession No	Qualitative characters										
		Early plant vigour	Plant growth habit	Leaf colour	Inflor. colour	Inflor. compactness	Stem colour	Stem surface	Inflor. shape	Inflor. spininess	Seed shattering	Seed colour
1	BGA-01	3	1	5	1	5	2	2	2	2	3	2
2	BGA-03	3	1	5	1	5	2	2	2	2	3	2
3	BGA-04	3	1	5	1	5	2	2	2	2	3	2
4	BGA-05	3	1	5	1	5	2	2	2	2	3	2
5	BGA-06	3	1	5	1	5	2	2	2	2	3	2
6	BGA-07	3	1	5	1	5	2	2	2	2	3	2
7	BGA-08	3	1	5	1	5	2	2	2	2	3	2
8	BGA-11	3	1	5	1	5	2	2	2	2	3	2
9	BGA-09	3	1	5	1	5	2	2	2	2	3	2
10	BGA-12	3	1	5	1	5	2	2	2	2	3	2
11	BGA-13	3	1	5	1	5	2	2	2	2	3	2
12	BGA-14	3	1	5	1	5	2	2	2	2	3	2
13	BGA-16	3	1	5	1	5	2	2	2	2	3	2
14	BGA-17	3	1	5	1	5	2	2	2	2	3	2
15	BGA-18	3	1	5	1	5	2	2	2	2	3	2
16	BGA-19	3	1	5	1	5	2	2	2	2	3	2
17	BGA-20	3	1	5	1	5	2	2	2	2	3	2
18	BGA-21	3	1	5	1	5	2	2	2	2	3	2
19	BGA-22	3	1	5	1	5	2	2	2	2	3	2
20	BGA-23	3	1	5	1	5	2	2	2	2	3	2
21	BGA-24	3	1	5	1	5	2	2	2	2	3	2
22	BGA-25	3	1	5	1	5	2	2	2	2	3	2
23	BGA-26	3	1	5	1	5	2	2	2	2	3	2
24	BGA-27	3	1	5	1	5	2	2	2	2	3	2
25	BGA-28	3	1	5	1	5	2	2	2	2	3	2
26	EC 519522	2	1	5	7	5	2	2	2	2	3	2
27	EC 519526	2	1	5	7	5	2	2	2	2	3	2
28	EC 519544	2	1	5	7	5	2	2	2	2	3	2
29	EC 519549	2	1	5	7	5	2	2	2	2	3	2
30	EC 519554	2	1	5	7	5	2	2	2	2	3	2
31	IC 037316	2	1	5	6	5	2	2	2	2	3	2
32	IC 038127	2	1	5	6	5	2	2	2	2	3	2

S.No.	Accession No	Qualitative characters										
		Early plant vigour	Plant growth habit	Leaf colour	Inflor. colour	Inflor. compactness	Stem colour	Stem surface	Inflor. shape	Inflor. spininess	Seed shattering	Seed colour
33	IC 038312	2	1	5	4	5	2	2	2	2	3	2
34	IC 0423117	2	1	5	4	5	2	2	2	2	3	2
35	IC 415222	2	1	5	4	5	2	2	2	2	3	2
36	IC415232	2	1	5	4	5	2	2	2	2	3	2
37	IC 415252	2	1	5	4	5	2	2	2	2	3	2
38	IC 415258	2	1	5	4	5	2	2	2	2	3	2
39	IC 415262	2	1	5	4	5	2	2	2	2	3	2
40	IC 415264	3	1	5	11	5	2	2	2	2	3	2
41	IC 415266	2	1	5	4	5	2	2	2	2	3	2
42	IC 415272	2	1	5	4	5	2	2	2	2	3	2
43	IC 415282	2	1	5	4	5	2	2	2	2	3	2
44	IC 415290	2	1	5	4	5	2	2	2	2	3	2
45	IC 415297	2	1	5	4	5	2	2	2	2	3	2
46	IC 415318	2	1	5	4	5	2	2	2	2	3	2
47	IC 415426	2	1	5	4	5	2	2	2	2	3	2
48	IC 415448	2	1	5	4	5	2	2	2	2	3	2
49	IC 423408	2	1	5	4	5	2	2	2	2	3	2
50	IC 423448	1	1	5	4	5	2	2	2	2	3	2
Means for check varieties												
	Annapurna	3	1	5	4	5	2	2	2	2	3	2
	GA-1	3	1	5	1	5	2	2	2	2	3	2
	GA-2	3	1	5	1	5	2	2	2	2	3	2
	Suvarna	3	1	5	1	7	2	2	2	2	3	8
	Minimum	**1**	**1**	**5**	**1**	**5**	**2**	**2**	**2**	**2**	**3**	**2**
	Maximum	**3**	**1**	**5**	**11**	**7**	**2**	**2**	**2**	**2**	**3**	**8**

Quantitative characters:- Leaf colour: 1-Yellow, 2-Yellowish orange, 3-Yellowish green, 4-Orange, 5-Green, 6-Greenish organge, 7-Pink, 8-Pinkish green, 9-Reddish yellow, 10-eddish green, 11-Red, 12-Dark red; Inflorescence colour: 1-Light yellow, 2-Yellow, 3-Yellowish organge, 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 121. Promising lines in rice bean germplasm (Kharif, 2006) for various characters at different locations (Plains).

S.No.	Characters	Range	Promising lines	Highest value of best check
Bangalore (Accessions 100)				
1.	Plant height (cm)	16.4-34.5	LRB-140, LRB-135, LRB-141, LRB-215, LRB-130, LRB-206, LRB-247, LRB-281, LRB-269, LRB-290 (>30.1 cm)	RBL-50 (28.0 cm)
2.	No. of branches	1.1-3.0	LRB-242, LRB-217, LRB-193, LRB-257, LRB-141, LRB-203, LRB-214, LRB-286 (> 2.3)	RBL-50 (1.8)
3.	Days to flowering	37.0-50.0	No accessions	RBL-50 (37.0 days)
4.	Days to maturity	74.0-80.2	No accessions	RBL-50 (74.0 days)
5.	No. of pods/plant	0.2-10.6	LRB-304, LRB-123, LRB-177, LRB-215, LRB-141-1, LRB-161, LRB-130, LRB-290, LRB-217 (>5.0)	RBL-35 (2.6)
6.	Seed yield (g/plant)	0.2-3.1	LRB-233 (>3.00 g)	RBL-35 (1.40 g)
Rahuri (Accessions 100)				
1.	Days to 50% flowering	41.00 56.00	LRB-148, LRB-162, LRB-142, LRB-152, LRB-169, LRB-220, LRB-244, LRB-258, LRB-269 (< 43.00 days)	RBL-1 (45.00 days)
2.	No. of branches	2.10-3.40	LRB-131, LRB-162, LRB-141, LRB-190, LRB-233, LRB-136, LRB-164, LRB-173, LRB-183, LRB-215, LRB-130(> 3.10)	RBL-6 (3.02)
3.	Plant height (cm)	72.00-108.00	LRB-120, LRB-138, LRB-136, LRB-123, LRB-139(> 105.00 cm)	RBL-1 (104.00 cm)
4.	Stem girth (cm)	0.30-0.60	LRB-163, LRB-152, LRB-197, LRB-230, LRB-273 (> 05.0 cm)	RBL-35 (0.50 cm)
5.	Length of pod (cm)	5.30-7.00	LRB-187, LRB-130, LRB-243, LRB-196, LRB-168, LRB-137, LRB-160, LRB-162, LRB-189 (> 5.90 cm)	RBL-1 (5.50 cm)
6.	Days to maturity	84.00-89.00	LRB-196, LRB-248, LRB-188, LRB-206, LRB-239, LRB-161, LRB-301,LRB-245,LRB-202 (< 85 .00days)	RBL-50 (85 .00 days)
7.	Grains per pod	4.20-6.20	LRB-180, LRB-197, LRB-170, LRB-152, LRB-232, LRB-189, LRB-229, LRB-187, LRB-238, LRB-237 (> 5.70)	RBL-50 (5.33)
8.	Seed yield (g/plant)	1.90-3.20	LRB-162, LRB-139, LRB-264, LRB-230, LRB-160, LRB-263, LRB-161, LRB-130 (> 2.90)	RBL-6 (2.80)
9.	100 grain weight (g)	5.00-6.00	LRB-279, LRB-120, LRB-186, LRB-139, LRB-177, LRB-301, LRB-135, LRB-187, LRB-290 (>5.70 g)	RBL-1 (5.60 g)

Ranchi (Accessions 100)				
1.	Days to 50%flowering	45.00-63.00	LRB 269, LRB 279, LRB 236, LRB 262, LRB 218, LRB 247, LRB 297, LRB 300 (< 48.00 days)	RBL35 (51.67 days)
2.	Days to maturity	98.00-112.00	LRB 248, LRB 263, LRB 123, LRB 162, LRB 265, LRB 271, LRB 245, LRB 161, LRB 141 (<101 days)	RBL35 (103.00 days)
3.	No. of branches	1.00-4.30	LRB 137, LRB 131, LRB 123, LRB 136, LRB 130, LRB 160, LRB 168, LRB 230 (> 3.3)	RBL 50 (3.25)
4.	Plant height(cm)	20.00-112.30	LRB 283, LRB 290, LRB 276, LRB 297, LRB 298, LRB 279, LRB 304, LRB 275, LRB 236, LRB 278 (> 93.00 cm)	RBL 1 (91.92 cm)
5.	Pod length (cm)	5.60-9.00	LRB 297,LRB 286 (> 8.6 cm)	RBL 1 (8.33 cm)
6.	Pods/plant	6.50-29.60	LRB 243, LRB 230, LRB 137, LRB 286, LRB 283, LRB 301, LRB 300, LRB 297, LRB 290, LRB 269 (>25.6)	RBL 50 (22.73)
7.	Seeds/pods	6.40-10.00	LRB 120, LRB 297, LRB 304, LRB 275, LRB 244, LRB 276 (> 9.3)	RBL 50 (8.57)
8.	Seed yield (g/plant)	2.60-8.60	LRB 168, LRB 123 (> 8.00)	RBL35 (8.23)
9.	100 seed wt (g)	3.70-6.47	No accessions	RBL35 (6.47 g)
S.K. Nagar (Accessions 100)				
1.	Days to 50% flowering	56.00-80.00	LRB 195, LRB 270, LRB 233, LRB 239, LRB 269, LRB 304, LRB 123, LRB 135 (59.00 days)	RBL 35 (64.10 days)
2.	Straw yield (%)	50.00-464.00	LRB 187, LRB 148, LRB 234, LRB 200, LRB 207, LRB 220, LRB 173, LRB 206, LRB 193, LRB 238, LRB 157, LRB 172, LRB 194, LRB 233, LRB 174, LRB 205, LRB 169 (> 270.00 %)	RBL 1 (172.90 %)
Ludhiana (Accessions 100)				
1.	Days to 50% flowering	55.00-68.00	LRB 123, LRB 206 (<56.00 days)	RBL 35(56.25 days)
2.	No. of branches/ plant	0.50-4.00	LRB 123, LRB 169, LRB 193, LRB 172, LRB 258, LRB 190, LRB 168, LRB 270 (> 3.20)	RBL 35(2.88 cm)
3.	Plant height (cm)	57.00-139.00	LRB 189, LRB 172, LRB 162, LRB 141, LRB 152, LRB 161, LRB 206, LRB 160, LRB 186, LRB 135 (> 12.00 cm)	RBL 35(98.13 cm)
4.	Pod length (cm)	6.40-9.00	LRB 189, LRB 162, LRB 152, LRB 142, LRB 139, LRB 136, LRB 184 (> 8.80 cm)	RBL 35(8.01 cm)

5.	Days to maturity	105.00-115.00	LRB 266, LRB 263, LRB 239, LRB 300, LRB 278, LRB 206, LRB 236, LRB 265, LRB 262, LRB 264, LRB 232, LRB 290, LRB 245 (< 106 days)	RBL 35 (106.00days)
6.	No. of seeds/ pod	5.00-9.40	LRB 177, LRB 217, LRB 163, LRB 142, LRB 220, LRB 152, LRB 161, LRB 138 (> 8.40)	RBL 35 (7.15)
7.	Seed yield (g/plant)	4.50-30.00	LRB 273, LRB 272, LRB 163, LRB 188, LRB 270, LRB 141, LRB 193, LRB 186, LRB 130, LRB 189 (> 18.00 g)	RBL 35 (13.84 g)
8.	100- seed wt. (g)	4.60-7.08	LRB 123, LRB 131, LRB 193, LRB 189, LRB 228, LRB 218, LRB 205, LRB 283, LRB 271, LRB 163 (> 6.73 g)	RBL 35(5.83 g)
Bhubaneswar (Accessions 135)				
1.	Days to 50% flowering	46.00-70.00	BRB 5, BRB 6, BRB 14 (<48.00 days)	RBL 50 (52.20 days)
2.	Days to maturity	84.00-104.00	BRB 5, BRB 6, BRB 14, LRB 233, LRB 234 (<84.9 days)	RBL 50 (85.00 days)
3.	Plant height (cm)	26.20-111.00	LRB 175, BRB 8-1, LRB 217, LRB 180, BRB 21, BRB 22, LRB 264, LRB 278, LRB 271, LRB 223, LRB 215, LRB 276, LRB 270, LRB 163, LRB 174, LRB 195, LRB 166 (> 91.00 cm)	RBL 35 (70.86 cm)
4.	No. of branches/ plant	1.00-4.60	LRB 218, LRB 142, LRB 175, LRB 217, LRB 215, LRB 166, BRB 11, LRB 152, LRB 180, BRB 19, LRB 272, LRB 190, LRB 236, LRB 130 (>3.00)	RBL 6 (2.36)
5.	Clusters per plant	4.80-24.40	LRB 218, LRB 142, LRB 220, LRB 175, LRB 217, LRB 215, LRB 236, LRB 223, LRB 163, LRB 166, LRB 237, LRB 200, LRB 177, LRB 207, LRB 257 (> 15.4)	RBL 35 (11.52)
6.	Pods per plant	10.20-43.00	BRB 14-1, BRB 22, LRB 200, BRB 3, BRB 15, BRB 6, BRB 14, BRB 20, LRB 236, LRB 237, BRB 15-1, LRB 173, BRB 1, BRB 8, BRB 9, BRB 24,BRB 10, LRB 239, LRB 205, BRB 17, BRB 18, LRB 257, LRB 198, LRB 152, LRB 140, BRB 21, LRB 202, BRB 19-1, LRB 196, LRB 183, LRB 234, LRB 161, BRB 2, LRB 263, BRB 7, BRB 4, LRB 215, LRB 197, BRB 3-1, LRB 185, LRB 162, LRB 141, LRB 218, BRB 19, LRB 194, LRB 220, BRB 7-1, LRB 180, LRB 195, BRB 16, LRB 203, LRB 136, BRB 12, LRB 164, BRB 11, LRB 206, BRB 13-1, LRB 281, LRB 160, LRB 304, BRB 4-1(> 24.4)	RBL 50 (20.24)
7.	Pod length (cm)	6.50-10.00	LRB 194, LRB 290, LRB 278, BRB 22 (> 9.4 cm)	RBL 6 (8.82 cm)
8.	Seeds per pod	5.10-8.70	BRB 15, LRB 278, LRB 185, LRB 237, LRB 247, BRB 11, BRB 13, LRB 236, LRB 254, LRB 142, LRB 20, LRB 258, BRB 8, BRB 9, BRB 7, LRB 174, LRB 140 (> 7.7)	RBL 1 (7.10)

9.	100 seed weight (g)	4.43-7.66	LRB 214, LRB 197, LRB 266, LRB 271 (>7.00 g)	RBL 6 (6.30 g)
10	Seed yield (g/plant)	4.23-15.70	BRB 20, BRB 22, BRB 14-1, BRB 15, BRB 14, BRB 21, BRB 15-1, BRB 10, BRB 3, BRB 24, BRB 6, BRB 8, BRB 1, BRB 19-1, BRB 4, LRB 207, BRB 19, BRB 9, BRB 13-1, BRB 7, LRB 200, BRB 11, BRB 3-1, BRB 5, BRB 7-1, BRB 18, BRB 26, BRB 16, BRB 2, LRB 203, BRB 13, BRB 12 (>8.83 g)	RBL 1(7.32 g)
11	Plot yield (g)	150.00-480.00	LRB 207, BRB 15-1, BRB 20, BRB 14-1, BRB 7 (> 445.00 g)	RBL 35 (369.00 g)
Delhi (Accessions 212)				
1.	Days to 50% flowering	74.00-118.00	LRB-148, LRB-229, LRB-180, LRB-238, LRB-080 (<80.00 days)	RBL-35 (80.44 days)
2.	Plant height (cm)	97.40-188.00	LRB-174, LRB-170, LRB-152, LRB-220, LRB-239, LRB-021-1, RSR/AKS-7, LRB-188, LRB-089, LRB-258 (> 165.40 cm)	RBL-35 (146.28 cm)
3.	No. of branches per plant	2.80-6.00	LRB-170, LRB-054 (>5.60)	RBL-35 (4.43)
4.	No. of pods/plant	22.00-105.00	LRB-265, LRB-258, LRB-236, LRB-234, LRB-170, DPRR-53, DPRR-10, LRB-173, DPRR-57 (>91.00)	RBL-35 (59.43)
5.	Pod length (cm)	7.20-12.15	LRB-290 (>10.50 cm)	RBL-6(8.95 cm)
6.	No. of grain per pod	5.80-10.60	LRB-234, LRB-123, LRB-140, LRB-187, LRB-275, LRB-013, LRB-194, LRB-264, LRB-241, LRB-035-1, LRB-177 (>9.90)	RBL-50 (8.34)
7.	Days to maturity	113.00-137.00	LRB-119, LRB-279, LRB-118, LRB-094, LRB-092, LRB-233, LRB-200, LRB-091 (<119.00 days)	RBL-35 (124.33 days)
8.	Seed yield per plot	120.00-650.00	LRB-189, LRB-025, LRB-172, LRB-013, LRB-243, LRB-275, LRB-024, LRB-139, DPRR-57, LRB-236 (> 565.0)	RBL-6 (463.33)
9.	Seed yield (g/plant)	6.00-33.50	LRB-157, LRB-241, LRB-218 (>31.00 g)	RBL-50 (19.00 g)
10.	Pedincle length (cm)	6.10-22.50	LRB-140, LRB-123, LRB-218 (>19.30 cm)	RBL-35 (13.62 cm)
11.	No. of pods per cluster	2.00-6.00	LRB-141, DPRR-25, LRB-123, LRB-136, LRB-162, LRB-205, LRB-130, LRB-164, LRB-034, LRB-140, LRB-236, LRB-232, LRB-031, LRB-102, LRB-223, LRB-218, LRB-190 (> 4.5)	RBL-35 (3.53)
12	100 seed weight (g)	3.12-8.28	LRB-157, LRB-257, LRB-286, LRB-266, LRB-217, LRB-174 (> 7.00 g)	RBL-35 (5.12 g)

Best entries over locations				
1.	Plant height (cm)	50.77-115.47	LRB-228, LRB-217, LRB-218, LRB-141-1, LRB-141, LRB-184, LRB-135, LRB-140, LRB-142, LRB-152 (>89.23 cm)	RBL-35 (85.04cm)
2.	No. of branches per plant	1.45-4.22	LRB-217, LRB-184, LRB-241, LRB-218, LRB-270, LRB-142, LRB-123 (> 3.07)	RBL-6 (2.78)
3.	Days to 50% flowering	50.86-68.57	No accessions	RBL-1 (54.03 days)
4.	Days to maturity	77.0-106.2	LRB-187 (< 85.00 days)	RBL-1 (91.1 days)
5.	Seed yield (g/plant)	3.57-14.82	LRB-241, LRB-189 LRB-193, LRB-273, LRB-141, LRB-172, LRB-162, LRB-184, LRB-163, LRB-218 (> 9.50 g)	RBL-35 (8.43 g)
6.	No. of pods/plant	12.48-45.35	LRB-241, LRB-236, LRB-184, LRB-258, LRB-173, LRB- 234, LRB-265, LRB-183, LRB-175, LRB-161 (>34.03)	RBL-50 (26.14)
7.	Seeds per pod	5.30-8.94	LRB-241, LRB-237, LRB-217, LRB-234, LRB-275, LRB-161, LRB-140, LRB-152 (> 7.78)	RBL-5 (7.14)
8.	Pod length (cm)	6.20-9.43	LRB-290, LRB-187, LRB-275, LRB-196, LRB-152, LRB-278, LRB-223, LRB-218 (> 8.00 cm)	RBL-6 (7.75 cm)
9.	100 grain weight (g)	4.40-7.10	LRB-266, LRB-257, LRB-157, LRB-271, LRB-187, LRB-193, LRB-205, LRB-163, LRB-217 (> 5.91 g)	RBL-35 (5.64 g)
10.	Seed yield per plot	162.5-565.0	LRB-207, LRB-214, LRB-162, LRB-236, LRB-196, LRB-205, LRB-234, LRB-217, LRB-258, LRB-275 (> 432.5)	RBL-6 (378.2)

Table 122. Multilocational evaluation of germplasm lines in rice bean at Bangalore, Rahuri, Ranchi, S.K. Nagar, Ludhiana, Delhi and Bhubaneswar - 2006 (Plains)

S.No.	Accession No,	Plant height (cm)									No. of branches per plant								
		Bangalore	Rahuri	Ranchi	Ludhiana		Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi		Bhubaneswar	Mean	
		Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.
1	LRB-120	26.80	108.00	50.60	74.00	87.88	148.00	50.80	76.37	87.88	1.80	2.50	3.00	3.20	4.00	4.25	1.60	2.68	4.25
2	LRB-123	27.60	106.00	32.00	86.00	99.88	137.00	41.00	71.60	99.88	2.10	2.40	4.00	4.00	4.40	4.65	1.60	3.08	4.65
3	LRB-130	32.60	100.00	62.30	90.00	103.88	118.00	67.40	78.38	103.88	1.70	3.20	3.60	3.20	3.50	3.75	3.20	3.07	3.75
4	LRB-131	29.30	90.00	66.30	106.00	119.88	124.00	63.00	79.77	119.88	1.90	3.40	4.30	3.00	4.00	4.25	1.80	3.07	4.25
5	LRB-135	33.10	104.00	66.30	114.00	127.88	155.00	70.00	90.40	127.88	2.00	2.50	3.30	3.00	4.00	3.75	2.40	2.87	3.75
6	LRB-136	26.40	106.00	52.60	102.00	115.88	139.00	73.00	83.17	115.88	1.60	3.20	3.60	2.70	3.35	3.10	2.60	2.84	3.10
7	LRB-137	25.80	105.00	53.00	76.00	89.88	135.00	70.40	77.53	89.88	2.10	2.30	4.30	2.20	3.20	2.95	2.00	2.68	2.95
8	LRB-138	25.10	107.00	54.00	92.00	105.88	108.00	49.20	72.55	105.88	2.00	2.10	3.30	0.50	3.00	2.75	1.00	1.98	2.75
9	LRB-139	28.50	106.00	76.60	103.00	116.88	126.00	56.60	82.78	116.88	2.20	2.20	3.30	3.00	4.40	4.15	1.40	2.75	4.15
10	LRB-140	34.50	102.00	75.30	106.00	119.88	146.00	76.00	89.97	119.88	2.20	2.20	3.00	2.20	4.00	3.75	1.80	2.57	3.75
11	LRB-141	32.90	102.00	88.60	121.00	134.88	146.00	54.00	90.75	134.88	2.40	3.20	2.60	3.00	4.00	3.75	2.80	3.00	3.75
12	LRB-141-1	29.60	100.00	73.30	110.00	123.88	156.00	76.00	90.82	123.88	2.30	2.40	3.30	2.50	4.00	3.75	2.40	2.82	3.75
13	LRB-142	20.80	92.00	83.30	112.00	125.88	144.00	87.00	89.85	125.88	1.80	2.50	2.60	2.50	5.00	4.75	4.20	3.10	4.75
14	LRB-148	26.80	89.00	61.30	90.00	73.21	154.40	79.40	83.48	73.21	1.50	2.60	2.30	2.50	4.70	4.45	2.00	2.60	4.45
15	LRB-152	22.50	89.00	47.60	119.00	102.21	183.00	76.60	89.62	102.21	1.50	2.10	2.60	2.70	4.30	4.05	3.60	2.80	4.05
16	LRB-157	20.70	90.00	48.30	95.00	78.21	161.00	83.60	83.10	78.21	2.10	3.10	2.30	3.20	5.00	4.75	2.00	2.95	4.75
17	LRB-160	25.90	92.00	44.60	115.00	98.21	153.00	67.00	82.92	98.21	2.00	2.40	3.60	2.70	4.00	3.75	1.40	2.68	3.75
18	LRB-161	23.80	95.00	60.60	119.00	102.21	139.00	77.40	85.80	102.21	1.60	2.20	2.30	2.70	5.25	5.00	2.60	2.78	5.00
19	LRB-162	27.60	90.00	51.60	123.00	106.21	118.00	84.60	82.47	106.21	1.90	3.20	2.30	3.00	5.00	4.75	2.40	2.97	4.75
20	LRB-163	21.90	91.00	46.30	106.00	89.21	165.00	93.00	87.20	89.21	1.30	2.40	3.00	3.20	4.00	3.75	2.80	2.78	3.75
21	LRB-164	21.30	76.00	58.00	100.00	83.21	113.00	91.00	76.55	83.21	1.20	3.20	3.00	3.20	3.50	3.25	2.20	2.72	3.25
22	LRB-166	22.60	75.00	59.60	92.00	75.21	125.00	92.00	77.70	75.21	2.00	2.60	3.30	2.50	4.25	4.00	3.60	3.04	4.00
23	LRB-168	24.30	72.00	63.60	102.00	85.21	145.00	66.20	78.85	85.21	1.10	3.00	3.60	3.50	4.00	3.75	1.60	2.80	3.75
24	LRB-169	23.60	78.00	40.60	109.00	92.21	155.00	58.20	77.40	92.21	1.40	2.40	3.00	4.00	5.00	4.75	2.60	3.07	4.75
25	LRB-170	25.90	75.00	47.00	89.00	72.21	186.00	67.80	81.78	72.21	1.70	2.40	2.00	2.70	6.00	5.75	1.80	2.77	5.75
26	LRB-172	23.60	72.00	48.60	124.00	107.21	162.00	61.40	81.93	107.21	1.90	2.60	3.00	3.70	5.00	4.75	1.80	3.00	4.75
27	LRB-173	18.40	76.00	35.00	102.00	93.21	164.00	59.20	75.77	93.21	1.80	3.20	2.60	3.20	5.00	4.75	2.20	3.00	4.75
28	LRB-174	22.70	74.00	48.60	95.00	86.21	188.00	92.60	86.82	86.21	2.30	2.20	2.60	2.70	4.50	4.79	1.40	2.62	4.79

**Table 122. Multiloc
and Bhubaneswar**

S.No.	Accession No,	Days to 50% flowering										Days to maturity						
		Bangalore	Rahuri	Ranchi		S.K. Nagar	Ludhiana	Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean
		Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
1	LRB-120	42.5	49	60	55.08	66.00	63	88	60	61.21	55.08	76.5	88	110	107	132.0	94	101.3
2	LRB-123	43.0	56	52	47.08	58.00	55	83	60	58.14	47.08	77.0	87	99	107	132.0	94	99.3
3	LRB-130	43.0	49	60	55.08	65.00	64	87	59	61.00	55.08	76.5	86	104	111	131.0	94	100.4
4	LRB-131	43.5	48	61	56.08	74.00	68	89	58	63.07	56.08	75.5	89	112	114	129.0	94	102.3
5	LRB-135	44.5	48	61	56.08	58.00	66	90	60	61.07	56.08	75.5	87	111	107	130.0	94	100.8
6	LRB-136	42.0	46	58	53.08	70.00	64	87	60	61.00	53.08	76.5	88	103	108	131.0	94	100.1
7	LRB-137	42.0	47	61	56.08	72.00	64	89	58	61.86	56.08	80.0	89	105	111	129.0	94	101.3
8	LRB-138	42.0	49	55	50.08	64.00	64	89	58	60.14	50.08	74.0	86	110	110	131.0	94	100.8
9	LRB-139	40.0	45	52	47.08	63.00	64	88	60	58.86	47.08	74.0	85	101	110	132.0	94	99.3
10	LRB-140	45.5	44	51	46.08	74.00	66	93	60	61.93	46.08	76.0	88	103	114	130.0	94	100.8
11	LRB-141	41.0	44	58	53.08	62.00	67	87	60	59.86	53.08	76.0	87	100	113	129.0	94	99.8
12	LRB-141-1	43.0	43	54	49.08	64.00	67	93	69	61.86	49.08	74.5	86	101	115	135.0	104	102.6
13	LRB-142	45.5	42	58	53.08	66.00	64	89	70	62.07	53.08	75.5	85	105	112	132.0	104	102.3
14	LRB-148	44.0	41	61	56.08	63.00	64	74	68	59.29	56.08	76.0	86	112	113	127.0	104	103.0
15	LRB-152	43.5	42	60	55.08	62.00	64	89	68	61.21	55.08	76.5	88	110	113	131.0	104	103.8
16	LRB-157	45.0	43	62	57.08	63.00	64	93	68	62.57	57.08	77.5	86	102	112	136.0	104	102.9
17	LRB-160	44.5	44	60	65.08	62.00	64	90	68	61.79	65.08	75.0	88	104	113	130.0	104	102.3
18	LRB-161	41.0	43	57	62.08	62.00	64	89	58	59.14	62.08	75.0	84	100	113	134.0	95	100.2
19	LRB-162	42.5	41	52	57.08	64.00	56	85	62	57.50	57.08	77.5	85	99	107	129.0	104	100.3
20	LRB-163	42.0	45	55	60.08	67.00	65	87	62	60.43	60.08	76.5	86	101	107	132.0	104	101.1
21	LRB-164	43.0	47	53	58.08	62.00	56	91	64	59.43	58.08	77.5	87	103	107	134.0	104	102.1
22	LRB-166	43.0	46	62	67.08	59.00	64	89	64	61.00	67.08	76.0	88	104	112	132.0	104	102.7
23	LRB-168	43.5	48	51	56.08	68.00	65	91	64	61.50	56.08	77.5	85	109	113	133.0	104	103.6
24	LRB-169	45.5	42	63	68.08	62.00	63	88	57	60.07	68.08	77.5	87	110	110	133.0	94	101.9
25	LRB-170	43.0	45	58	63.08	64.00	64	93	58	60.71	63.08	75.5	86	109	111	134.0	94	101.6
26	LRB-172	42.0	48	62	67.08	65.00	64	89	58	61.14	67.08	76.5	88	106	113	132.0	94	101.6
27	LRB-173	45.5	47	58	63.08	64.00	64	90	57	60.79	63.08	76.5	86	101	113	131.0	94	100.3
28	LRB-174	48.0	45	61	66.08	62.00	67	92	56	61.57	66.08	80.2	85	109	114	134.0	94	102.7

**Table 122. Multiloc
and Bhubaneswar**

S.No.	Accession No,	Seed yield (g/plant)							No. of pods/plant							
		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean	Bangalore	Ranchi	Adj.	Delhi	Bhubaneswar		Mean	
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.
1	LRB-120	0.86	2.80	6.20	6.20	16.0	4.23	6.05	5.0	18.00	21.97	62.00	18.2	17.09	25.80	19.53
2	LRB-123	1.09	2.60	8.30	18.00	20.0	5.85	9.31	10.6	23.60	27.57	74.00	17.2	16.09	31.35	21.83
3	LRB-130	0.92	3.00	7.50	20.00	20.0	5.20	9.44	6.0	24.30	28.27	53.00	23.0	21.89	26.58	25.08
4	LRB-131	0.68	2.80	5.50	17.70	21.0	6.70	9.06	5.0	24.30	28.27	53.00	21.6	20.49	25.98	24.38
5	LRB-135	0.70	2.70	6.30	10.00	19.0	6.08	7.46	3.6	21.60	25.57	54.00	21.6	20.49	25.20	23.03
6	LRB-136	0.44	2.60	6.40	10.70	20.0	6.33	7.75	0.8	19.00	22.97	52.50	26.0	24.89	24.58	23.93
7	LRB-137	0.80	2.70	5.80	14.70	12.0	6.12	7.02	4.6	28.30	32.27	44.00	16.8	15.69	23.43	23.98
8	LRB-138	0.58	2.70	5.30	4.50	15.0	5.04	5.52	3.0	20.30	24.27	46.00	15.0	13.89	21.08	19.08
9	LRB-139	0.94	3.20	6.00	10.70	24.0	6.33	8.53	4.8	21.00	24.97	55.00	20.6	19.49	25.35	22.23
10	LRB-140	0.90	2.60	5.30	7.50	18.0	6.75	6.84	4.8	19.00	22.97	59.00	28.6	27.49	27.85	25.23
11	LRB-141	0.62	2.50	6.80	20.50	24.0	7.43	10.31	3.8	23.30	27.27	63.00	27.2	26.09	29.33	26.68
12	LRB-141-1	0.88	2.80	4.20	9.50	22.0	6.24	7.60	6.2	21.00	24.97	55.00	21.8	20.69	26.00	22.83
13	LRB-142	0.42	2.70	5.00	8.20	25.0	5.95	7.88	2.0	21.30	25.27	84.00	18.6	17.49	31.48	21.38
14	LRB-148	0.96	2.80	7.50	10.50	20.0	7.51	8.21	5.0	16.00	19.97	69.60	20.0	18.89	27.65	19.43
15	LRB-152	0.38	2.50	2.60	14.10	20.0	7.04	7.77	0.8	14.60	18.57	67.00	28.8	27.69	27.80	23.13
16	LRB-157	0.44	2.50	3.30	9.20	33.5	8.03	9.50	1.8	22.30	26.27	91.00	21.0	19.89	34.03	23.08
17	LRB-160	0.58	3.10	4.60	8.50	17.0	7.51	6.88	3.2	23.60	18.44	57.00	25.0	23.89	27.20	21.17
18	LRB-161	0.80	3.00	5.40	8.50	20.0	7.61	7.55	6.0	18.30	13.14	84.00	28.0	26.89	34.08	20.02
19	LRB-162	0.58	3.20	5.80	17.10	25.0	8.45	10.02	4.6	19.30	14.14	70.00	27.2	26.09	30.28	20.12
20	LRB-163	0.84	2.40	5.90	21.50	19.0	8.37	9.67	3.8	15.60	10.44	58.00	19.0	17.89	24.10	14.17
21	LRB-164	0.38	2.80	4.80	11.50	25.0	7.41	8.65	1.0	14.00	8.84	49.00	25.8	24.69	22.45	16.77
22	LRB-166	0.52	2.70	6.40	9.00	21.0	6.83	7.74	3.6	17.00	11.84	75.50	24.4	23.29	30.13	17.57
23	LRB-168	0.44	2.50	8.60	9.20	20.0	4.95	7.62	1.4	21.60	16.44	70.00	17.6	16.49	27.65	16.47
24	LRB-169	0.42	2.40	7.70	8.20	27.0	5.17	8.48	2.6	20.30	15.14	66.35	24.0	22.89	28.31	19.02
25	LRB-170	0.42	2.30	6.40	5.70	31\4	4.44	3.85	4.0	10.30	5.14	95.00	22.6	21.49	32.98	13.32
26	LRB-172	0.38	2.40	5.00	17.50	30.0	4.97	10.04	3.0	15.30	10.14	75.00	21.2	20.09	28.63	15.12
27	LRB-173	0.60	2.50	4.80	6.80	21.0	5.25	6.83	2.0	18.30	13.14	93.00	30.8	29.69	36.03	21.42
28	LRB-174	0.38	2.70	4.70	13.20	30.0	5.30	9.38	2.0	14.30	9.14	83.00	22.8	25.32	30.53	17.23

Table 122. Multiloc
and Bhubaneswar

S.No.	Accession No,	Seeds per pod								Pod length (cm)					
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
1	LRB-120	5.20	10.00	10.39	6.20	6.80	7.9	7.22	10.39	5.50	8.30	8.40	7.80	8.8	7.76
2	LRB-123	4.50	8.30	8.69	5.80	10.50	6.4	7.10	8.69	5.40	6.00	8.80	9.80	8.7	7.74
3	LRB-130	5.20	8.00	8.39	7.20	8.75	7.7	7.37	8.39	6.00	8.60	8.20	9.10	7.9	7.96
4	LRB-131	5.30	9.00	9.39	6.00	7.90	7.6	7.16	9.39	5.50	8.00	8.40	8.20	8.4	7.70
5	LRB-135	4.50	8.00	8.39	7.20	9.50	6.2	7.08	8.39	5.30	8.00	8.60	9.30	8.6	7.96
6	LRB-136	5.30	8.00	8.39	5.60	8.00	6.4	6.66	8.39	5.60	7.30	9.00	8.90	7.5	7.66
7	LRB-137	5.20	9.00	9.39	6.20	6.50	6.1	6.60	9.39	6.00	8.00	7.20	7.25	8.4	7.37
8	LRB-138	4.60	7.30	7.69	8.60	6.90	7.3	6.94	7.69	5.50	6.60	8.80	7.60	8.0	7.30
9	LRB-139	5.20	8.60	8.99	8.20	7.00	6.9	7.18	8.99	5.40	7.00	9.00	7.80	7.8	7.40
10	LRB-140	5.20	8.20	8.59	8.00	10.50	7.8	7.94	8.59	5.60	6.30	8.80	9.75	7.9	7.67
11	LRB-141	4.20	8.60	8.99	7.80	9.00	6.6	7.24	8.99	5.50	7.60	8.40	8.50	8.0	7.60
12	LRB-141-1	5.20	9.00	9.39	6.40	9.35	7.6	7.51	9.39	5.60	7.30	8.40	9.60	8.5	7.88
13	LRB-142	5.20	7.50	7.89	9.00	9.30	7.9	7.78	7.89	5.30	7.00	9.00	9.50	9.2	8.00
14	LRB-148	4.20	7.60	7.99	7.00	9.00	6.7	6.90	7.99	5.40	6.60	8.00	9.00	8.5	7.50
15	LRB-152	6.00	9.00	9.39	8.80	9.30	6.3	7.88	9.39	5.60	8.00	9.00	9.00	8.7	8.06
16	LRB-157	5.30	8.50	8.89	6.00	9.00	7.7	7.30	8.89	5.50	7.60	6.40	9.25	9.0	7.55
17	LRB-160	5.60	7.60	8.26	7.60	8.50	6.3	7.12	8.26	6.00	6.60	7.00	9.40	9.2	7.64
18	LRB-161	5.40	9.30	9.96	8.80	9.80	6.6	7.98	9.96	5.40	7.30	8.80	9.00	7.7	7.64
19	LRB-162	5.20	8.30	8.96	8.00	8.30	7.1	7.38	8.96	6.00	6.60	9.00	9.00	8.5	7.82
20	LRB-163	4.60	8.60	9.26	9.00	8.00	6.0	7.24	9.26	5.60	7.30	8.00	8.40	8.5	7.56
21	LRB-164	4.20	8.60	9.26	6.60	8.50	7.2	7.02	9.26	5.40	7.30	7.40	9.20	8.3	7.52
22	LRB-166	5.20	7.60	8.26	7.00	8.00	7.5	7.06	8.26	5.60	6.30	8.80	8.50	9.1	7.66
23	LRB-168	4.20	8.60	9.26	7.00	9.00	6.0	6.96	9.26	6.00	6.60	8.40	9.40	8.6	7.80
24	LRB-169	5.40	9.00	9.66	5.80	7.00	6.7	6.78	9.66	5.70	8.30	8.40	7.60	7.9	7.58
25	LRB-170	6.00	8.00	8.66	7.00	9.50	6.8	7.46	8.66	5.40	7.00	8.80	9.50	8.2	7.78
26	LRB-172	4.60	7.60	8.26	8.40	9.00	6.2	7.16	8.26	5.50	6.30	8.80	8.30	7.5	7.28
27	LRB-173	5.40	7.60	8.26	7.40	9.25	6.8	7.29	8.26	5.30	6.30	7.80	9.50	7.8	7.34
28	LRB-174	5.60	8.00	8.66	7.20	9.00	7.8	7.52	8.66	5.40	6.60	8.20	9.00	8.0	7.44

**Table 122. Multiloc
and Bhubaneswar**

S.No.	Accession No,	100 grain weight (g)								Seed yield per plot			Delhi			Bhubaneswar	Rahuri
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Delhi	Bhubaneswar	Mean	No. of pods per cluster		Pedincle length (cm)	Clusters per plant	Stem girth (cm)
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
1	LRB-120	6.00	5.60	5.34	5.62	5.70	5.22	5.63	5.34	380.0	200	290.0	2.7	2.23	12.10	8.0	0.50
2	LRB-123	5.40	5.20	4.94	7.08	5.62	5.72	5.80	4.94	425.0	280	352.5	5.2	4.68	21.00	7.8	0.40
3	LRB-130	5.60	6.20	5.94	5.69	4.82	5.08	5.48	5.94	490.0	225	357.5	5.0	4.53	10.50	9.6	0.50
4	LRB-131	5.30	3.80	3.54	7.02	5.32	6.14	5.52	3.54	350.0	205	277.5	2.6	2.13	9.50	9.2	0.40
5	LRB-135	5.70	3.80	3.54	5.61	5.00	5.20	5.06	3.54	460.0	240	350.0	3.5	3.53	13.50	9.6	0.50
6	LRB-136	5.30	3.80	3.54	4.98	5.65	5.35	5.02	3.54	440.0	250	345.0	5.0	5.03	18.00	12.4	0.50
7	LRB-137	5.50	4.70	4.44	4.89	5.24	5.55	5.18	4.44	325.0	225	275.0	3.0	3.03	18.50	8.2	0.40
8	LRB-138	5.10	4.80	4.54	4.95	6.50	5.47	5.36	4.54	300.0	225	262.5	3.6	3.58	11.00	5.8	0.50
9	LRB-139	5.80	4.90	4.64	5.29	5.24	5.46	5.34	4.64	580.0	285	432.5	3.7	3.73	11.50	9.6	0.40
10	LRB-140	5.40	5.60	5.34	6.72	5.55	5.01	5.66	5.34	360.0	315	337.5	4.8	4.83	22.50	11.6	0.30
11	LRB-141	5.10	5.30	5.04	5.87	6.30	4.74	5.46	5.04	490.0	365	427.5	6.0	6.03	11.50	11.6	0.50
12	LRB-141-1	5.40	3.90	3.64	4.96	5.67	6.04	5.19	3.64	410.0	250	330.0	3.8	3.83	13.10	10.2	0.50
13	LRB-142	5.30	4.10	3.84	5.80	6.25	5.96	5.48	3.84	450.0	255	352.5	2.8	2.83	10.50	22.8	0.40
14	LRB-148	5.60	4.80	4.54	6.34	4.75	6.36	5.57	4.54	330.0	350	340.0	3.0	3.03	15.60	9.8	0.50
15	LRB-152	5.40	4.30	4.04	5.40	5.55	5.69	5.27	4.04	465.0	335	400.0	2.0	2.03	16.10	13.4	0.60
16	LRB-157	5.20	5.80	5.54	5.42	8.28	6.01	6.14	5.54	440.0	385	412.5	2.7	2.73	11.20	14.2	0.50
17	LRB-160	5.30	5.20	5.49	5.01	6.22	6.83	5.71	5.49	400.0	360	380.0	4.5	4.53	15.37	11.2	0.40
18	LRB-161	5.10	5.70	5.99	6.32	6.12	4.99	5.65	5.99	420.0	370	395.0	3.0	3.03	15.00	10.8	0.50
19	LRB-162	5.60	4.90	5.19	5.51	5.07	6.66	5.55	5.19	560.0	405	482.5	5.0	5.03	17.10	13.0	0.40
20	LRB-163	5.40	5.60	5.89	6.74	5.28	6.58	5.92	5.89	410.0	360	385.0	2.8	2.83	16.00	18.4	0.60
21	LRB-164	5.40	5.10	5.39	5.98	6.50	6.48	5.89	5.39	500.0	325	412.5	5.0	5.03	8.15	13.6	0.50
22	LRB-166	5.10	5.60	5.89	6.29	6.40	5.91	5.86	5.89	410.0	280	345.0	3.3	3.33	11.80	16.6	0.40
23	LRB-168	5.30	5.40	5.69	5.60	5.92	5.88	5.62	5.69	320.0	210	265.0	4.0	4.03	17.00	8.0	0.50
24	LRB-169	5.50	5.30	5.59	5.45	7.00	5.49	5.75	5.59	490.0	225	357.5	4.5	4.53	15.75	11.2	0.40
25	LRB-170	5.30	4.90	5.19	6.49	5.82	5.35	5.57	5.19	415.0	180	297.5	2.8	2.78	13.00	8.4	0.50
26	LRB-172	5.10	5.80	6.09	6.61	5.61	4.94	5.61	6.09	630.0	170	400.0	2.8	2.83	17.00	8.4	0.50
27	LRB-173	5.40	5.20	5.49	4.84	6.10	4.56	5.22	5.49	520.0	230	375.0	3.7	3.73	13.00	12.8	0.50
28	LRB-174	5.60	3.90	4.19	5.99	7.40	5.02	5.58	4.19	415.0	225	320.0	3.0	3.63	14.40	9.8	0.40

S.No.	Accession No,	Plant height (cm)									No. of branches per plant								
		Bangalore	Rahuri	Ranchi	Ludhiana		Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi		Bhubaneswar	Mean	
		Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.
29	LRB-175	20.10	77.00	44.00	95.00	86.21	142.00	111.00	81.52	86.21	2.00	2.40	2.30	1.70	5.00	5.29	4.00	2.90	5.29
30	LRB-177	20.80	72.00	20.00	99.00	90.21	134.35	81.60	71.29	90.21	1.50	2.60	1.30	2.00	4.00	4.29	2.60	2.33	4.29
31	LRB-180	16.40	76.00	25.30	83.00	74.21	165.00	106.60	78.72	74.21	1.20	3.00	2.40	2.00	4.00	4.29	3.40	2.67	4.29
32	LRB-183	-	75.00	31.30	79.00	70.21	157.00	78.80	84.22	70.21	-	3.20	1.30	2.70	4.50	4.79	2.60	2.86	4.79
33	LRB-184	-	75.00	77.50	88.00	79.21	133.00	79.00	90.50	79.21	-	2.60	2.80	2.70	5.40	5.69	2.80	3.26	5.69
34	LRB-185	22.40	76.00	72.50	84.00	75.21	123.00	79.00	76.15	75.21	1.90	2.40	2.70	2.00	3.75	4.04	2.60	2.56	4.04
35	LRB-186	24.10	73.00	41.30	115.00	106.21	126.00	36.00	69.23	106.21	2.10	3.00	2.30	2.50	4.00	4.29	1.20	2.52	4.29
36	LRB-187	22.90	77.00	56.30	103.00	94.21	122.00	46.60	71.30	94.21	2.10	2.60	3.00	3.00	5.00	5.29	1.20	2.82	5.29
37	LRB-188	25.00	74.00	69.50	107.00	98.21	166.00	31.20	78.78	98.21	2.20	3.00	3.10	2.20	4.25	4.54	2.60	2.89	4.54
38	LRB-189	24.30	76.00	34.30	139.00	130.21	152.35	45.30	78.54	130.21	1.30	2.40	1.30	3.00	4.25	4.54	1.80	2.34	4.54
39	LRB-190	22.40	72.00	56.40	73.00	64.21	134.50	75.00	72.22	64.21	1.50	3.20	2.30	3.50	4.00	4.29	3.20	2.95	4.29
40	LRB-193	28.20	73.00	31.30	106.00	127.54	152.00	89.60	80.02	127.54	2.50	2.60	1.00	4.00	5.00	5.29	2.60	2.95	5.29
41	LRB-194	23.60	77.00	56.40	71.00	92.54	164.00	90.00	80.33	92.54	1.90	2.80	2.20	1.20	4.00	4.29	2.80	2.48	4.29
42	LRB-195	17.50	77.00	63.20	81.00	102.54	120.60	92.00	75.22	102.54	1.70	2.80	3.10	1.20	4.00	4.29	2.60	2.57	4.29
43	LRB-196	20.80	74.00	40.00	98.00	119.54	150.00	90.00	78.80	119.54	1.70	3.00	2.00	2.00	4.75	5.04	2.80	2.71	5.04
44	LRB-197	-	75.00	32.20	84.00	105.54	140.75	69.00	80.19	105.54	-	2.40	2.00	3.00	4.75	5.04	2.60	2.95	5.04
45	LRB-198	24.70	74.00	72.30	87.00	108.54	140.80	70.80	78.27	108.54	1.50	2.60	2.50	2.70	3.20	3.49	2.20	2.45	3.49
46	LRB-200	-	78.00	59.80	90.00	111.54	137.25	79.60	88.93	111.54	-	2.40	3.10	3.00	4.25	4.54	2.60	3.07	4.54
47	LRB-202	22.30	74.00	80.00	88.00	109.54	144.00	72.20	80.08	109.54	1.90	2.40	1.30	2.70	4.00	4.29	1.60	2.32	4.29
48	LRB-203	28.90	73.00	61.60	103.00	124.54	127.00	50.40	73.98	124.54	2.40	2.60	3.00	3.00	3.80	4.09	1.30	2.68	4.09
49	LRB-205	22.70	75.00	66.20	84.00	105.54	157.00	76.00	80.15	105.54	2.10	2.30	3.00	2.00	3.50	3.79	2.40	2.55	3.79
50	LRB-206	32.40	72.00	27.30	116.00	137.54	132.00	65.80	74.25	137.54	1.90	2.50	1.60	1.50	4.00	4.29	2.40	2.32	4.29
51	LRB-207	21.00	74.00	67.30	76.00	97.54	153.00	85.80	79.52	97.54	2.20	2.60	2.60	2.20	4.25	4.54	2.20	2.68	4.54
52	LRB-214	25.30	73.00	82.30	76.00	97.54	118.35	87.60	77.09	97.54	2.40	2.40	2.00	2.20	4.40	4.75	1.80	2.53	4.75
53	LRB-215	32.80	77.00	73.30	75.00	54.88	139.00	95.00	82.02	54.88	2.20	3.20	2.60	2.20	3.60	3.95	3.80	2.93	3.95
54	LRB-217	30.10	74.00	76.60	110.00	89.88	158.15	109.00	92.98	89.88	2.50	3.00	3.00	3.00	4.30	4.65	3.80	3.27	4.65
55	LRB-218	26.10	76.00	93.00	110.00	89.88	163.50	87.00	92.60	89.88	1.70	2.60	2.30	3.00	4.75	5.10	4.60	3.16	5.10
56	LRB-220	21.50	72.00	76.00	106.00	85.88	173.45	86.40	89.23	85.88	1.50	2.40	2.30	2.20	5.00	5.35	2.80	2.70	5.35
57	LRB-223	22.00	73.00	70.60	97.00	76.88	134.00	96.00	82.10	76.88	2.10	3.00	2.60	1.20	5.60	5.95	2.80	2.88	5.95
58	LRB-228	-	76.00	75.30	108.00	87.88	138.00	85.00	96.46	87.88	-	2.40	3.00	2.50	4.70	5.05	1.60	2.84	5.05
59	LRB-229	29.80	78.00	65.30	89.00	68.88	128.80	79.40	78.38	68.88	1.50	3.00	2.30	2.70	4.00	4.35	2.80	2.72	4.35

S.No.	Accession No,	Days to 50% flowering										Days to maturity						
		Bangalore	Rahuri	Ranchi		S.K. Nagar	Ludhiana	Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean
		Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
29	LRB-175	43.5	46	61	66.08	66.00	67	90	56	61.36	66.08	77.5	88	112	113	132.0	94	102.8
30	LRB-177	47.5	44	56	61.08	67.00	64	85	58	60.21	61.08	77.5	86	105	110	133.0	94	100.9
31	LRB-180	45.0	45	55	60.08	65.00	64	76	49	57.00	60.08	77.5	85	103	107	134.0	84	98.4
32	LRB-183	-	47	60	65.08	69.00	63	88	50	62.83	65.08	-	87	102	108	131.0	84	102.4
33	LRB-184	-	44	53	53.33	67.00	62	83	50	59.83	53.33	-	86	101	108	127.0	84	101.2
34	LRB-185	40.5	47	59	59.33	66.00	64	91	50	59.64	59.33	74.0	88	110	113	134.0	84	100.5
35	LRB-186	43.0	45	51	51.33	63.00	66	93	58	59.86	51.33	77.5	85	108	108	137.0	94	101.6
36	LRB-187	40.0	44	56	56.33	65.00	65	93	58	60.14	56.33	76.0	87	1.7	112	135.0	94	84.3
37	LRB-188	40.0	46	60	60.33	62.00	64	93	60	60.71	60.33	74.0	84	112	110	130.0	95	100.8
38	LRB-189	40.5	47	56	56.33	62.00	57	90	58	58.64	56.33	74.0	86	111	113	133.0	93	101.7
39	LRB-190	42.0	45	58	58.33	65.00	62	89	60	60.14	58.33	76.5	87	106	115	126.0	95	100.9
40	LRB-193	42.5	46	56	56.33	62.00	64	89	59	59.79	56.33	76.5	88	106	108	131.0	95	100.8
41	LRB-194	40.0	48	58	58.33	59.00	67	85	62	59.86	58.33	76.5	88	109	106	134.0	103	102.8
42	LRB-195	39.5	45	57	57.33	56.00	64	89	63	59.07	57.33	76.5	86	108	108	123.0	103	100.8
43	LRB-196	40.5	44	60	60.33	78.00	63	85	62	61.79	60.33	76.5	84	109	113	130.0	103	102.6
44	LRB-197	-	46	56	56.33	79.00	65	91	62	66.50	56.33	-	85	112	106	123.0	103	105.8
45	LRB-198	44.5	45	55	55.33	80.00	64	88	62	62.64	55.33	77.5	87	106	107	128.0	103	101.4
46	LRB-200	-	43	58	58.33	64.00	64	80	64	62.17	58.33	-	85	108	108	116.0	103	104.0
47	LRB-202	43.0	46	56	56.33	67.00	64	91	64	61.57	56.33	75.0	84	102	112	130.0	103	101.0
48	LRB-203	49.5	47	60	60.33	62.00	63	90	64	62.21	60.33	77.5	86	108	106	132.0	103	102.1
49	LRB-205	40.0	46	55	55.08	64.00	64	93	64	60.86	55.08	76.0	88	111	106	134.0	103	103.0
50	LRB-206	42.5	43	53	53.08	63.00	55	83	62	57.36	53.08	74.0	84	104	105	132.0	103	100.3
51	LRB-207	40.5	47	49	49.08	62.00	64	91	60	59.07	49.08	77.5	86	105	108	131.0	103	101.8
52	LRB-214	46.0	45	50	50.08	62.00	64	87	60	59.14	50.08	77.0	85	101	108	127.0	103	100.2
53	LRB-215	44.5	47	54	54.08	71.00	64	82	60	60.36	54.08	76.0	85	106	113	123.0	103	101.0
54	LRB-217	47.0	43	51	51.08	67.00	64	85	61	59.71	51.08	76.5	88	105	113	132.0	103	102.9
55	LRB-218	47.0	44	47	47.08	62.00	58	87	61	58.00	47.08	79.0	89	107	114	129.0	103	103.5
56	LRB-220	49.0	42	52	52.08	64.00	63	89	61	60.00	52.08	79.0	87	104	114	130.0	103	102.8
57	LRB-223	44.0	46	56	56.08	62.00	64	93	61	60.86	56.08	77.5	89	107	114	127.0	103	102.9
58	LRB-228	-	45	49	49.08	66.00	63	91	58	62.00	49.08	-	88	104	114	130.0	95	106.2
59	LRB-229	46.0	44	55	55.08	78.00	64	75	60	60.29	55.08	75.0	86	108	113	126.0	95	100.5

S.No.	Accession No,	Seed yield (g/plant)							No. of pods/plant							
		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean	Bangalore	Ranchi	Adj.	Delhi	Bhubaneswar		Mean	
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.
29	LRB-175	0.74	2.80	4.10	7.00	23.0	4.77	7.07	3.0	23.60	18.44	89.00	21.8	24.32	34.35	21.38
30	LRB-177	0.80	2.90	5.20	8.50	14.0	5.20	6.10	8.0	16.50	11.34	62.25	23.8	26.32	27.64	18.83
31	LRB-180	0.56	2.60	5.70	17.20	20.0	5.94	8.67	1.0	15.40	10.24	60.00	26.2	28.72	25.65	19.48
32	LRB-183	-	2.70	5.80	11.50	19.0	6.22	9.04	-	10.00	4.84	68.00	28	30.52	35.33	17.68
33	LRB-184	-	2.80	5.80	11.70	22.0	6.31	9.72	-	20.60	24.12	73.70	21.2	23.72	38.50	23.92
34	LRB-185	0.38	2.30	6.80	8.50	24.0	6.71	8.12	1.2	18.60	22.12	44.50	27.2	29.72	22.88	25.92
35	LRB-186	0.34	2.40	5.80	20.50	16.0	4.96	8.33	0.4	11.00	14.52	69.00	10.4	12.92	22.70	13.72
36	LRB-187	0.20	2.50	6.90	16.00	15.0	5.27	7.65	0.4	16.50	20.02	75.00	19.6	22.12	27.88	21.07
37	LRB-188	0.20	2.80	6.40	21.00	19.0	4.85	9.04	0.6	14.60	18.12	79.00	16.4	18.92	27.65	18.52
38	LRB-189	-	2.60	6.80	18.50	25.0	4.43	11.47	0.4	7.30	10.82	61.00	10.3	12.82	19.75	11.82
39	LRB-190	0.58	2.70	6.30	8.50	21.0	5.73	7.47	1.0	6.50	10.02	66.00	17.6	20.12	22.78	15.07
40	LRB-193	0.42	2.50	6.20	20.50	31.0	5.64	11.04	0.2	8.00	11.52	91.00	17.8	20.32	29.25	15.92
41	LRB-194	0.42	2.70	6.70	6.70	19.0	8.48	7.33	0.2	9.00	12.52	52.00	27	29.52	22.05	21.02
42	LRB-195	0.46	2.50	6.80	5.50	15.0	8.57	6.47	0.6	10.00	13.52	35.40	26.2	28.72	18.05	21.12
43	LRB-196	0.36	2.60	5.90	5.00	23.0	8.63	7.58	1.4	14.50	18.02	84.00	28.2	30.72	32.03	24.37
44	LRB-197	-	2.70	5.30	15.30	14.0	6.58	8.78	-	9.60	13.12	57.50	27.4	29.92	31.50	21.52
45	LRB-198	0.66	2.60	5.80	10.00	17.0	8.41	7.41	2.4	18.70	22.22	54.00	29	31.52	26.03	26.87
46	LRB-200	-	2.50	6.50	6.50	8.0	10.20	6.74	-	22.30	25.82	33.00	36.2	38.72	30.50	32.27
47	LRB-202	0.32	2.40	5.80	12.20	20.0	8.52	8.21	0.8	17.60	21.12	67.00	28.6	31.12	28.50	26.12
48	LRB-203	0.54	2.40	6.40	11.70	18.0	9.22	8.04	1.2	23.60	27.12	53.00	26.2	28.72	26.00	27.92
49	LRB-205	0.46	2.50	5.20	9.50	20.0	8.41	7.68	1.2	13.20	15.99	40.00	29.6	32.12	21.00	24.06
50	LRB-206	0.34	2.60	5.40	13.70	17.0	8.63	7.95	0.4	16.00	18.79	65.30	25.6	28.12	26.83	23.46
51	LRB-207	0.38	2.70	6.80	15.40	18.0	10.58	8.98	2.4	18.00	20.79	63.00	21.8	24.32	26.30	22.56
52	LRB-214	0.60	2.80	5.30	14.50	25.0	8.67	9.48	1.8	17.60	20.39	74.00	22.8	25.32	29.05	22.86
53	LRB-215	1.04	2.60	6.20	8.50	16.0	7.83	7.03	7.2	18.00	20.79	46.60	27.6	30.12	24.85	25.46
54	LRB-217	1.03	2.80	6.80	14.50	22.0	7.91	9.17	5.2	20.30	23.09	73.50	21	23.52	30.00	23.31
55	LRB-218	0.64	2.50	5.30	9.20	32.0	8.23	9.65	2.6	18.60	21.39	72.65	27.0	25.54	30.21	23.47
56	LRB-220	0.74	1.90	6.80	6.50	20.0	8.28	7.37	2.2	20.00	22.79	52.50	26.8	25.34	25.38	24.07
57	LRB-223	0.54	1.90	5.90	6.40	28.0	6.54	8.21	2.2	18.60	21.39	86.00	24.2	22.74	32.75	22.07
58	LRB-228	-	2.40	5.50	9.50	22.0	5.48	8.98	-	17.60	20.39	51.85	20.6	19.14	30.02	19.77
59	LRB-229	0.66	2.60	5.80	6.70	17.0	6.30	6.51	4.4	17.00	19.79	47.00	21.4	19.94	22.45	19.87

S.No.	Accession No,	Seeds per pod								Pod length (cm)					
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
29	LRB-175	5.40	7.60	8.26	7.00	8.00	7.3	7.06	8.26	5.50	7.30	7.20	8.70	8.9	7.52
30	LRB-177	5.30	7.60	8.26	9.40	10.00	6.6	7.78	8.26	5.30	6.00	7.00	8.75	7.9	6.99
31	LRB-180	6.20	7.10	7.76	6.60	9.00	7.5	7.28	7.76	5.30	6.40	7.00	9.10	8.6	7.28
32	LRB-183	4.30	7.60	8.26	7.20	8.80	7.7	7.12	8.26	5.40	5.60	7.60	9.00	7.3	6.98
33	LRB-184	5.20	7.30	6.81	8.00	9.30	6.8	7.32	6.81	5.50	7.50	9.00	9.10	8.2	7.86
34	LRB-185	5.10	7.90	7.41	6.80	7.00	8.2	7.00	7.41	5.40	8.20	8.20	7.20	8.8	7.56
35	LRB-186	5.40	9.00	8.51	7.20	7.35	7.4	7.27	8.51	5.60	8.00	8.20	8.50	8.2	7.70
36	LRB-187	5.80	7.00	6.51	6.00	10.30	7.0	7.22	6.51	7.00	7.60	8.20	10.00	8.8	8.32
37	LRB-188	5.60	7.50	7.01	7.60	9.90	5.2	7.16	7.01	5.60	8.20	8.20	9.00	8.3	7.86
38	LRB-189	5.80	8.30	7.81	6.80	8.00	5.1	6.80	7.81	6.00	7.00	9.00	8.75	7.6	7.67
39	LRB-190	5.20	8.00	7.51	7.20	9.25	7.5	7.43	7.51	5.40	7.50	8.00	9.20	8.4	7.70
40	LRB-193	5.40	6.60	6.11	7.40	9.00	7.0	7.08	6.11	5.50	5.60	8.40	9.25	8.0	7.35
41	LRB-194	5.40	6.40	5.91	5.40	10.00	7.5	6.94	5.91	5.50	6.40	6.40	9.70	10.0	7.60
42	LRB-195	4.90	7.60	7.11	6.60	8.20	6.8	6.82	7.11	5.40	7.80	7.00	9.05	9.4	7.73
43	LRB-196	4.80	9.00	8.51	8.00	9.60	7.2	7.72	8.51	6.00	8.00	8.00	9.70	8.7	8.08
44	LRB-197	6.00	8.30	7.81	5.40	7.80	5.2	6.54	7.81	5.90	7.00	7.40	8.55	8.6	7.49
45	LRB-198	5.40	7.50	7.01	8.40	9.20	6.5	7.40	7.01	5.40	7.30	8.00	9.70	8.7	7.82
46	LRB-200	5.20	8.20	7.71	6.40	8.50	6.0	6.86	7.71	5.50	6.80	7.50	8.80	8.4	7.40
47	LRB-202	5.20	8.60	8.11	5.60	9.00	6.6	7.00	8.11	5.30	7.30	7.40	8.65	8.3	7.39
48	LRB-203	5.40	9.30	8.81	6.20	9.00	6.6	7.30	8.81	5.50	8.20	8.00	8.75	8.9	7.87
49	LRB-205	5.60	8.40	8.61	7.60	9.00	5.5	7.22	8.61	5.40	7.80	8.20	9.10	7.6	7.62
50	LRB-206	4.60	7.60	7.81	6.40	9.25	6.3	6.83	7.81	5.50	6.30	7.20	8.90	8.3	7.24
51	LRB-207	4.80	8.30	8.51	7.00	9.00	6.0	7.02	8.51	5.40	7.30	7.40	8.90	8.1	7.42
52	LRB-214	5.60	8.30	8.51	6.80	8.65	7.0	7.27	8.51	5.30	6.60	8.20	8.75	9.0	7.57
53	LRB-215	5.10	8.60	8.81	7.80	7.60	6.6	7.14	8.81	5.70	7.30	6.80	8.60	8.2	7.32
54	LRB-217	5.30	8.60	8.81	9.40	9.75	7.0	8.01	8.81	5.50	7.60	8.00	8.70	9.3	7.82
55	LRB-218	5.40	9.00	9.21	7.20	9.35	6.6	7.51	9.21	5.40	8.00	8.40	9.20	9.1	8.02
56	LRB-220	5.60	8.00	8.21	9.00	8.45	7.4	7.69	8.21	5.50	7.00	7.60	9.15	9.2	7.69
57	LRB-223	4.50	9.00	9.21	8.40	9.25	7.4	7.71	9.21	5.40	8.30	8.40	9.55	8.5	8.03
58	LRB-228	5.20	8.00	8.21	5.60	9.65	6.3	6.95	8.21	5.50	7.60	8.60	9.10	6.5	7.46
59	LRB-229	5.80	8.30	8.51	5.80	9.00	7.7	7.32	8.51	5.70	7.00	7.20	9.48	8.4	7.56

S.No.	Accession No,	100 grain weight (g)								Seed yield per plot			Delhi			Bhubaneswar	Rahuri
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Delhi	Bhubaneswar	Mean	No. of pods per cluster		Pedincle length (cm)	Clusters per plant	Stem girth (cm)
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
29	LRB-175	5.40	4.60	4.89	5.97	6.08	4.87	5.38	4.89	485.0	205	345.0	3.0	3.63	15.30	21.8	0.50
30	LRB-177	5.80	5.70	5.99	5.16	5.58	5.11	5.47	5.99	380.0	235	307.5	2.8	3.38	16.00	16.2	0.50
31	LRB-180	5.60	5.60	5.89	5.24	5.69	5.29	5.48	5.89	440.0	285	362.5	3.0	3.63	9.50	14.8	0.50
32	LRB-183	5.20	6.10	6.39	5.60	5.52	5.05	5.49	6.39	420.0	300	360.0	3.0	3.63	12.50	15.2	0.50
33	LRB-184	5.60	5.40	5.09	4.73	4.92	5.17	5.16	5.09	380.0	270	325.0	3.5	4.13	12.50	15.4	0.40
34	LRB-185	5.10	5.30	4.99	6.54	5.21	5.32	5.49	4.99	460.0	340	400.0	3.0	3.63	14.40	14.2	0.40
35	LRB-186	5.90	5.20	4.89	5.40	5.96	5.12	5.52	4.89	370.0	190	280.0	3.8	4.38	9.60	5.2	0.50
36	LRB-187	5.70	4.80	4.49	6.42	6.20	6.78	5.98	4.49	335.0	265	300.0	3.25	3.88	16.80	5.8	0.40
37	LRB-188	5.30	4.60	4.29	6.43	6.80	6.24	5.87	4.29	410.0	260	335.0	3.0	3.63	12.20	7.0	0.50
38	LRB-189	5.10	6.40	6.09	6.94	5.53	5.10	5.81	6.09	650.0	165	407.5	2.8	3.43	17.00	5.0	0.40
39	LRB-190	5.40	5.70	5.39	5.45	5.90	6.30	5.75	5.39	565.0	240	402.5	4.8	5.38	15.25	8.6	0.50
40	LRB-193	5.30	4.50	4.19	6.96	6.70	6.27	5.95	4.19	460.0	255	357.5	3.0	3.63	11.80	6.4	0.50
41	LRB-194	5.10	4.80	4.49	6.24	5.25	5.63	5.40	4.49	445.0	420	432.5	4.0	4.63	10.50	11.0	0.40
42	LRB-195	5.30	4.70	4.39	6.29	5.29	5.32	5.38	4.39	250.0	435	342.5	3.0	3.63	12.50	13.2	0.50
43	LRB-196	5.50	5.10	4.79	6.27	6.20	6.47	5.91	4.79	510.0	410	460.0	3.8	4.43	15.00	12.6	0.50
44	LRB-197	5.40	4.30	3.99	5.28	5.65	7.63	5.65	3.99	280.0	315	297.5	3.25	3.88	13.10	13.6	0.60
45	LRB-198	5.40	5.30	4.99	5.29	4.95	6.01	5.39	4.99	350.0	420	385.0	3.4	4.03	13.18	12.0	0.50
46	LRB-200	5.20	4.90	4.59	6.18	4.26	5.26	5.16	4.59	175.0	445	310.0	3.75	4.38	10.37	16.4	0.50
47	LRB-202	5.00	4.90	4.59	6.10	5.04	6.36	5.48	4.59	385.0	385	385.0	3.0	3.63	13.20	9.4	0.40
48	LRB-203	5.40	5.00	4.69	6.48	5.91	6.52	5.86	4.69	400.0	425	412.5	3.0	3.63	11.50	9.6	0.50
49	LRB-205	5.10	5.10	4.76	6.85	6.50	6.06	5.92	4.76	515.0	400	457.5	5.0	5.63	14.40	11.6	0.50
50	LRB-206	5.20	5.20	4.86	5.94	6.25	5.94	5.71	4.86	350.0	435	392.5	4.0	4.63	15.10	15.2	0.40
51	LRB-207	5.20	5.70	5.36	5.12	6.74	5.62	5.68	5.36	500.0	480	490.0	3.0	3.63	13.30	16.0	0.50
52	LRB-214	5.40	4.70	4.36	5.90	5.22	7.66	5.78	4.36	550.0	420	485.0	4.32	4.18	14.50	14.2	0.40
53	LRB-215	5.60	4.20	3.86	5.80	5.60	6.39	5.52	3.86	220.0	380	300.0	2.1	1.94	10.70	21.0	0.50
54	LRB-217	5.30	4.80	4.46	5.79	7.60	6.10	5.92	4.46	500.0	395	447.5	3.8	3.66	13.50	21.8	0.40
55	LRB-218	5.20	3.80	3.46	6.90	5.85	6.09	5.57	3.46	500.0	365	432.5	4.75	4.61	20.50	24.4	0.50
56	LRB-220	5.40	5.60	5.26	5.67	6.80	4.43	5.58	5.26	300.0	390	345.0	3.8	3.61	15.80	22.8	0.40
57	LRB-223	5.10	4.50	4.16	5.43	6.38	5.73	5.43	4.16	490.0	300	395.0	4.8	4.66	11.63	18.8	0.50
58	LRB-228	5.20	4.60	4.26	6.90	5.90	4.48	5.42	4.26	410.0	280	345.0	3.0	2.86	13.53	9.2	0.50
59	LRB-229	5.10	4.20	3.86	5.60	5.20	6.00	5.22	3.86	300.0	265	282.5	2.8	2.66	19.30	10.4	0.40

S.No.	Accession No,	Plant height (cm)									No. of branches per plant									
		Bangalore	Rahuri	Ranchi	Ludhiana		Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi		Bhubaneswar	Mean	
		Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.
60	LRB-230	18.00	74.00	84.00	90.00	69.88	132.40	79.40	79.63	69.88	1.40	2.60	3.60	1.70	3.60	3.95	2.40	2.55	3.95
61	LRB-232	23.30	72.00	54.60	84.00	63.88	136.00	87.00	76.15	63.88	1.70	2.40	1.30	2.00	5.00	5.35	1.60	2.33	5.35
62	LRB-233	21.20	74.00	81.00	85.00	64.88	128.94	74.40	77.42	64.88	1.40	3.20	2.30	2.70	3.60	3.95	1.80	2.50	3.95
63	LRB-234	24.70	76.00	83.30	75.00	54.88	152.00	77.60	81.43	54.88	1.90	2.60	2.60	2.70	5.00	5.35	2.00	2.80	5.35
64	LRB-236	19.10	77.00	95.30	85.00	64.88	137.35	73.20	81.16	64.88	1.60	2.50	2.00	2.50	5.35	5.70	3.20	2.86	5.70
65	LRB-237	24.10	74.00	75.00	90.00	69.88	111.50	81.00	75.93	69.88	1.80	2.60	2.60	2.20	4.35	4.70	2.60	2.69	4.70
66	LRB-238	21.20	76.00	81.30	83.00	89.88	143.85	46.40	75.29	89.88	1.90	2.60	1.60	2.70	4.25	4.60	1.60	2.44	4.60
67	LRB-239	25.80	72.00	78.30	75.00	81.88	170.20	85.80	84.52	81.88	2.00	2.40	2.30	2.20	4.60	4.95	2.20	2.62	4.95
68	LRB-241	-	73.00	76.30	72.00	78.88	123.60	68.20	82.62	78.88	-	2.50	2.60	2.70	5.40	5.75	2.80	3.20	5.75
69	LRB-242	27.10	72.00	76.30	91.00	97.88	145.50	61.40	78.88	97.88	3.00	2.60	2.60	2.20	5.00	5.35	2.00	2.90	5.35
70	LRB-243	23.10	77.00	80.30	73.00	79.88	131.00	43.60	71.33	79.88	1.50	3.00	2.30	2.20	4.00	4.35	1.00	2.33	4.35
71	LRB-244	26.50	78.00	69.60	75.00	81.88	142.65	64.80	76.09	81.88	1.70	3.00	1.60	2.00	4.70	5.05	1.20	2.37	5.05
72	LRB-245	24.60	74.00	81.60	57.00	63.88	137.00	36.20	68.40	63.88	1.90	2.60	2.00	0.50	4.60	4.95	1.00	2.10	4.95
73	LRB-247	31.60	72.00	84.00	82.00	88.88	119.20	84.20	78.83	88.88	1.80	2.40	2.30	2.20	3.80	4.15	2.20	2.45	4.15
74	LRB-248	20.80	77.00	81.00	90.00	96.88	143.70	55.80	78.05	96.88	1.50	2.60	3.00	2.70	4.65	5.00	1.80	2.71	5.00
75	LRB-254	28.00	75.00	73.30	91.00	97.88	151.00	82.00	83.38	97.88	1.20	3.00	2.60	2.50	3.80	4.15	1.60	2.45	4.15
76	LRB-257	27.50	74.00	61.60	91.00	97.88	143.80	79.20	79.52	97.88	2.50	2.50	2.30	1.00	3.60	3.95	2.80	2.45	3.95
77	LRB-258	28.60	76.00	58.60	90.00	96.88	165.65	67.00	80.98	96.88	1.60	2.50	2.00	3.70	4.60	4.49	2.60	2.83	4.49
78	LRB-262	22.90	72.00	70.60	89.00	95.88	127.80	89.00	78.55	95.88	1.90	2.60	1.50	3.20	4.00	3.89	2.20	2.57	3.89
79	LRB-263	23.40	78.00	46.60	87.00	87.88	137.00	84.00	76.00	87.88	1.80	2.40	1.60	2.70	3.60	3.49	2.40	2.42	3.49
80	LRB-264	29.80	76.00	86.60	86.00	86.88	145.00	99.00	87.07	86.88	2.00	2.60	2.30	2.70	4.68	4.57	2.80	2.85	4.57
81	LRB-265	27.50	78.00	59.60	81.00	81.88	150.00	68.00	77.35	81.88	1.90	3.00	1.60	2.70	5.35	5.24	2.40	2.83	5.24
82	LRB-266	27.00	74.00	77.00	94.00	94.88	139.40	46.80	76.37	94.88	1.70	2.40	1.60	2.20	4.40	4.29	1.00	2.22	4.29
83	LRB-269	30.30	76.00	69.60	102.00	102.88	150.20	68.40	82.75	102.88	1.40	2.60	2.60	2.70	3.80	3.69	1.80	2.48	3.69
84	LRB-270	24.90	75.00	90.60	96.00	96.88	152.00	93.20	88.62	96.88	2.00	2.40	2.60	3.50	5.34	5.23	3.00	3.14	5.23
85	LRB-271	28.70	76.00	64.00	94.00	94.88	135.80	97.00	82.58	94.88	2.10	2.60	2.30	3.20	3.40	3.29	3.00	2.77	3.29
86	LRB-272	26.80	74.00	52.60	102.00	102.88	152.60	87.20	82.53	102.88	1.60	3.00	1.30	3.00	3.60	3.49	3.20	2.62	3.49
87	LRB-273	27.10	73.00	88.60	111.00	111.88	130.80	84.40	85.82	111.88	1.60	2.60	2.30	3.00	3.60	3.49	1.60	2.45	3.49
88	LRB-275	22.60	74.00	96.30	85.00	85.88	141.00	63.80	80.45	85.88	1.20	2.60	2.30	3.20	5.00	4.89	2.20	2.75	4.89
89	LRB-276	28.50	76.00	103.60	88.00	88.88	119.80	94.60	85.08	88.88	2.30	2.40	2.60	2.20	3.60	3.49	2.80	2.65	3.49
90	LRB-278	18.30	78.00	94.00	68.00	68.88	151.00	97.20	84.42	68.88	1.10	2.50	2.30	2.00	4.20	4.09	2.60	2.45	4.09

S.No.	Accession No,	Days to 50% flowering										Days to maturity						
		Bangalore	Rahuri	Ranchi		S.K. Nagar	Ludhiana	Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean
		Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
60	LRB-230	42.5	45	52	52.08	76.00	63	87	60	60.79	52.08	74.0	85	109	107	130.0	95	100.0
61	LRB-232	44.5	47	52	52.08	66.00	64	81	60	59.21	52.08	79.0	85	104	105	127.0	95	99.2
62	LRB-233	47.5	45	53	53.08	57.00	64	89	48	57.64	53.08	79.0	88	105	107	115.0	84	96.3
63	LRB-234	46.0	47	51	51.08	63.00	64	89	48	58.29	51.08	77.5	87	103	107	131.0	84	98.3
64	LRB-236	44.5	46	46	46.08	62.00	63	85	48	56.36	46.08	75.0	86	103	105	131.0	84	97.3
65	LRB-237	42.0	46	53	52.08	64.00	64	85	48	57.43	52.08	75.0	89	102	106	133.0	84	98.2
66	LRB-238	40.5	45	49	48.08	66.00	59	77	48	54.93	48.08	79.0	88	106	106	127.0	84	98.3
67	LRB-239	44.0	44	53	52.08	57.00	63	88	48	56.71	52.08	77.5	84	109	105	121.0	84	96.8
68	LRB-241	-	47	51	50.08	59.00	64	88	48	59.50	50.08	-	85	109	106	132.0	84	103.2
69	LRB-242	44.5	48	52	51.08	76.00	64	89	48	60.21	51.08	75.0	88	107	110	128.0	84	98.7
70	LRB-243	44.5	46	51	50.08	60.00	64	87	48	57.21	50.08	76.0	87	102	106	131.0	84	97.7
71	LRB-244	43.0	42	55	54.08	72.00	64	90	48	59.14	54.08	77.5	85	108	106	127.0	84	97.9
72	LRB-245	42.0	48	51	50.08	66.00	59	89	50	57.86	50.08	75.0	84	100	105	130.0	84	96.3
73	LRB-247	39.5	44	47	46.08	67.00	64	82	58	57.36	46.08	74.0	86	103	107	128.0	95	98.8
74	LRB-248	39.5	43	52	51.08	74.00	64	89	58	59.93	51.08	74.0	84	98	110	130.0	95	98.5
75	LRB-254	46.0	45	58	57.08	68.00	64	89	58	61.14	57.08	76.5	88	103	112	120.0	95	99.1
76	LRB-257	50.0	44	57	56.08	78.00	64	90	61	63.43	56.08	79.0	89	101	106	124.0	104	100.5
77	LRB-258	47.0	42	49	48.08	62.00	64	90	61	59.29	48.08	75.0	87	102	107	131.0	104	101.0
78	LRB-262	40.5	47	46	45.08	63.00	65	84	61	58.07	45.08	76.0	86	101	105	128.0	104	100.0
79	LRB-263	43.0	43	53	52.08	65.00	59	89	61	59.00	52.08	78.5	89	98	105	127.0	104	100.3
80	LRB-264	41.0	46	50	49.08	61.00	59	83	60	57.14	49.08	77.5	87	101	105	128.0	104	100.4
81	LRB-265	41.5	47	57	56.08	64.00	64	93	60	60.93	56.08	77.5	89	99	105	129.0	104	100.6
82	LRB-266	45.5	43	56	55.08	67.00	64	93	58	60.93	55.08	77.5	87	101	105	131.0	95	99.4
83	LRB-269	45.2	42	45	45.33	57.00	65	90	55	57.03	45.33	77.5	89	104	106	127.0	93	99.4
84	LRB-270	43.0	47	51	51.33	56.00	67	93	55	58.86	51.33	79.0	86	103	112	127.0	93	100.0
85	LRB-271	42.5	46	48	48.33	63.00	67	93	58	59.64	48.33	76.0	89	100	113	127.0	93	99.7
86	LRB-272	39.5	45	54	54.33	67.00	64	91	58	59.79	54.33	75.0	85	104	113	124.0	93	99.0
87	LRB-273	41.5	43	53	53.33	61.00	64	87	58	58.21	53.33	75.0	87	107	113	127.0	93	100.3
88	LRB-275	39.0	44	59	59.33	63.00	65	92	58	60.00	59.33	74.0	86	106	113	131.0	93	100.5
89	LRB-276	46.5	47	56	56.33	75.00	65	93	60	63.21	56.33	76.5	88	108	113	127.0	93	100.9
90	LRB-278	44.5	46	51	51.33	61.00	57	80	60	57.07	51.33	75.5	85	104	105	127.0	93	98.3

S.No.	Accession No,	Seed yield (g/plant)							No. of pods/plant							
		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean	Bangalore	Ranchi	Adj.	Delhi	Bhubaneswar		Mean	
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.
60	LRB-230	0.72	3.10	6.80	8.70	16.0	5.87	6.87	3.6	29.00	31.79	50.00	20.0	18.54	25.65	25.17
61	LRB-232	0.56	2.80	5.70	12.50	21.0	6.77	8.22	3.6	16.00	18.79	88.00	17.8	16.34	31.35	17.57
62	LRB-233	3.06	2.50	6.60	12.10	15.0	7.08	7.72	1.0	16.30	19.09	45.00	21.8	20.34	21.03	19.72
63	LRB-234	0.64	2.40	6.50	12.90	24.0	7.24	8.95	3.4	15.60	18.39	96.65	28.0	26.54	35.91	22.47
64	LRB-236	0.22	2.40	5.60	15.20	25.0	7.91	9.39	1.0	21.00	23.79	100.60	32.6	31.14	38.80	27.47
65	LRB-237	0.38	2.50	4.90	13.50	20.0	7.42	8.12	1.8	24.60	26.22	61.00	32.0	30.54	29.85	28.38
66	LRB-238	0.26	2.40	6.00	9.00	23.0	7.67	8.06	2.4	21.60	23.22	60.25	21.2	19.74	26.36	21.48
67	LRB-239	0.30	2.50	6.80	11.10	26.0	7.46	9.03	1.6	23.00	24.62	67.60	29.6	28.14	30.45	26.38
68	LRB-241	-	2.40	5.90	17.50	33.0	7.33	13.23	-	22.00	23.62	80.00	21.8	20.34	41.27	21.98
69	LRB-242	0.20	2.60	7.90	8.20	22.0	6.80	7.95	1.0	23.00	24.62	61.00	18.0	16.54	25.75	20.58
70	LRB-243	0.38	2.80	5.80	7.70	18.0	5.72	6.73	2.4	29.60	31.22	51.70	16.0	14.54	24.93	22.88
71	LRB-244	0.38	2.30	5.40	5.20	14.0	4.40	5.28	2.6	18.00	19.62	62.60	10.4	8.94	23.40	14.28
72	LRB-245	0.26	2.50	6.80	5.00	17.0	7.77	6.56	1.4	20.60	22.22	71.65	15.2	13.74	27.21	17.98
73	LRB-247	0.74	2.60	4.80	7.50	10.0	7.05	5.45	4.4	21.60	23.22	54.40	19.4	17.94	24.95	20.58
74	LRB-248	0.68	2.50	5.50	9.20	24.0	7.12	8.17	1.8	20.00	21.62	73.68	18.2	16.74	28.42	19.18
75	LRB-254	0.94	2.70	5.30	6.00	23.0	7.58	7.59	1.8	17.30	18.92	57.80	19.6	18.14	24.13	18.53
76	LRB-257	1.04	2.50	5.80	12.00	15.0	8.83	7.53	3.4	13.60	15.22	49.40	29.0	27.54	23.85	21.38
77	LRB-258	0.44	2.60	6.20	15.70	19.0	8.75	8.78	4.4	16.30	17.92	102.40	23.8	22.34	36.73	20.13
78	LRB-262	0.68	2.90	6.80	11.20	10.0	8.77	6.73	2.4	15.30	16.92	49.60	23.6	22.14	22.73	19.53
79	LRB-263	0.52	3.10	6.80	15.50	8.0	7.62	6.92	1.0	15.00	16.62	45.60	28.0	26.54	22.40	21.58
80	LRB-264	0.44	3.20	6.80	11.50	16.0	6.84	7.46	1.2	21.30	22.92	89.65	20.6	19.14	33.19	21.03
81	LRB-265	0.52	2.60	5.60	11.70	22.0	6.66	8.18	1.4	14.30	15.92	105.00	21.0	19.54	35.43	17.73
82	LRB-266	0.52	2.70	4.50	11.20	18.0	5.21	7.02	1.8	23.00	24.62	75.00	11.8	10.87	27.90	17.75
83	LRB-269	0.40	2.70	5.40	10.50	17.0	5.74	6.96	1.8	25.00	18.27	56.40	16.6	15.67	24.95	16.97
84	LRB-270	0.46	2.70	6.70	20.70	15.0	7.91	8.91	2.2	22.00	15.27	75.35	22.6	21.67	30.54	18.47
85	LRB-271	0.58	2.60	5.90	10.70	14.0	6.85	6.77	2.0	23.30	16.57	50.40	18.8	17.87	23.63	17.22
86	LRB-272	0.76	2.30	5.70	23.00	15.0	7.22	9.00	3.8	15.60	8.87	49.40	15.4	14.47	21.05	11.67
87	LRB-273	0.46	2.40	4.90	30.00	18.0	7.35	10.52	1.0	20.00	13.27	50.80	18.4	17.47	22.55	15.37
88	LRB-275	0.46	2.50	5.80	8.50	28.0	6.88	8.69	2.2	19.00	12.27	78.00	15.4	14.47	28.65	13.37
89	LRB-276	0.62	2.60	4.80	7.00	10.0	6.92	5.32	2.6	15.60	8.87	49.20	16.2	15.27	20.90	12.07
90	LRB-278	0.48	2.50	5.00	4.70	25.0	7.11	7.47	0.6	13.60	6.87	57.20	17.2	16.27	22.15	11.57

S.No.	Accession No,	Seeds per pod								Pod length (cm)							
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean		
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.		
60	LRB-230	5.60	9.00	9.21	6.40	9.75	7.7	7.69	9.21	5.50	8.30	7.00	8.90	8.3	7.60		
61	LRB-232	5.80	8.00	8.21	5.60	9.00	6.9	7.06	8.21	5.40	7.00	7.00	8.50	8.6	7.30		
62	LRB-233	5.60	8.00	8.21	7.20	7.20	7.2	7.04	8.21	5.50	6.60	8.00	7.48	8.4	7.20		
63	LRB-234	5.60	9.00	9.21	7.80	10.60	7.0	8.00	9.21	5.70	7.30	8.40	10.00	8.1	7.90		
64	LRB-236	4.60	8.60	8.81	5.60	9.30	8.0	7.22	8.81	5.60	7.60	7.20	9.25	8.1	7.55		
65	LRB-237	5.80	9.30	8.84	8.00	9.00	8.2	8.06	8.84	5.50	8.00	8.00	9.50	8.0	7.80		
66	LRB-238	5.80	9.00	8.54	8.40	8.00	7.2	7.68	8.54	5.40	8.00	7.60	8.80	8.4	7.64		
67	LRB-239	5.60	8.30	7.84	7.60	7.40	6.5	7.08	7.84	5.50	6.60	8.00	7.52	8.2	7.16		
68	LRB-241	5.40	9.30	8.84	-	10.00	7.7	8.10	8.84	5.50	8.60	-	9.50	7.8	7.85		
69	LRB-242	4.50	9.00	8.54	7.00	9.00	6.4	7.18	8.54	5.40	8.30	7.40	9.40	7.3	7.56		
70	LRB-243	5.40	9.00	8.54	7.20	9.30	7.1	7.60	8.54	6.00	8.60	7.00	9.45	8.1	7.83		
71	LRB-244	5.20	9.60	9.14	7.00	8.36	7.1	7.45	9.14	5.40	8.00	8.00	8.55	7.8	7.55		
72	LRB-245	5.60	8.30	7.84	6.00	9.00	6.8	7.14	7.84	5.40	7.00	7.00	9.20	7.9	7.30		
73	LRB-247	5.30	8.60	8.14	7.60	8.60	8.2	7.66	8.14	5.50	7.00	8.00	9.16	7.8	7.49		
74	LRB-248	5.40	8.30	7.84	6.60	9.00	6.7	7.20	7.84	5.60	7.50	7.40	9.30	7.3	7.42		
75	LRB-254	5.40	9.00	8.54	5.00	8.00	7.9	7.06	8.54	5.50	8.00	8.00	8.62	9.3	7.88		
76	LRB-257	5.40	8.00	7.54	6.80	7.80	7.1	7.02	7.54	5.40	6.60	8.00	8.10	8.3	7.28		
77	LRB-258	5.30	8.60	8.14	7.00	8.66	7.9	7.49	8.14	5.60	7.00	8.00	8.95	8.6	7.63		
78	LRB-262	4.60	8.60	8.14	6.60	8.80	7.4	7.20	8.14	5.50	7.00	7.00	9.28	9.1	7.58		
79	LRB-263	5.40	9.00	8.54	7.00	8.00	6.1	7.10	8.54	5.40	7.30	8.40	8.14	8.3	7.51		
80	LRB-264	4.60	8.60	8.14	6.20	10.00	7.0	7.28	8.14	5.50	8.30	7.00	9.60	9.0	7.88		
81	LRB-265	5.70	7.60	7.14	6.10	8.40	6.9	6.94	7.14	5.50	6.30	7.20	8.60	8.6	7.24		
82	LRB-266	5.40	8.00	7.54	7.20	8.00	6.7	7.06	7.54	5.40	7.00	8.40	8.70	8.0	7.50		
83	LRB-269	5.60	7.60	7.29	7.00	9.00	6.4	7.12	7.29	5.50	7.30	7.20	9.64	7.5	7.43		
84	LRB-270	5.40	9.00	8.69	8.00	9.30	6.9	7.72	8.69	5.50	8.30	7.60	8.65	8.3	7.67		
85	LRB-271	5.20	9.30	8.99	6.60	9.00	7.4	7.50	8.99	5.60	6.30	7.20	9.16	9.0	7.45		
86	LRB-272	5.00	9.00	8.69	7.20	8.20	6.6	7.20	8.69	5.40	7.00	8.40	8.48	8.4	7.54		
87	LRB-273	5.30	9.00	8.69	7.40	7.80	6.8	7.26	8.69	5.70	6.30	7.40	8.10	8.1	7.12		
88	LRB-275	5.40	9.60	9.29	8.00	10.30	6.7	8.00	9.29	5.90	8.00	8.60	9.70	8.2	8.08		
89	LRB-276	5.60	9.60	9.29	7.20	9.20	7.3	7.78	9.29	5.40	8.30	8,8	9.30	8.9	7.98		
90	LRB-278	4.60	9.30	8.99	7.20	7.80	8.5	7.48	8.99	5.50	8.00	8.00	8.86	9.8	8.03		

S.No.	Accession No,	100 grain weight (g)								Seed yield per plot			Delhi			Bhubaneswar	Rahuri
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Delhi	Bhubaneswar	Mean	No. of pods per cluster		Pedincle length (cm)	Clusters per plant	Stem girth (cm)
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
60	LRB-230	5.40	4.00	3.66	5.41	6.60	5.04	5.29	3.66	280.0	255	267.5	3.0	2.86	12.60	12.8	0.60
61	LRB-232	5.30	4.30	3.96	6.36	5.80	6.01	5.55	3.96	475.0	295	385.0	4.8	4.66	13.20	7.8	0.50
62	LRB-233	5.60	3.90	3.56	5.88	4.43	5.63	5.09	3.56	350.0	300	325.0	2.8	2.66	9.68	11.4	0.50
63	LRB-234	5.10	5.20	4.86	5.96	5.05	5.43	5.35	4.86	560.0	340	450.0	3.8	3.66	14.75	13.4	0.50
64	LRB-236	5.00	4.65	4.31	5.79	6.18	5.26	5.38	4.31	570.0	375	472.5	4.8	4.66	13.85	20.4	0.40
65	LRB-237	5.40	3.85	3.71	5.59	6.17	4.60	5.12	3.71	505.0	310	407.5	2.6	2.46	10.00	16.4	0.50
66	LRB-238	5.60	5.25	5.11	5.47	5.32	6.15	5.56	5.11	490.0	325	407.5	3.25	3.11	11.20	11.6	0.50
67	LRB-239	5.40	5.60	5.46	5.37	5.08	5.31	5.35	5.46	500.0	330	415.0	3.0	2.86	13.36	13.2	0.40
68	LRB-241	5.30	4.40	4.26	5.43	5.34	5.48	5.19	4.26	400.0	285	342.5	4.4	4.26	16.40	14.6	0.50
69	LRB-242	5.10	5.90	5.76	5.00	5.15	5.19	5.27	5.76	475.0	220	347.5	4.00	3.86	12.75	9.4	0.40
70	LRB-243	5.20	5.50	5.36	4.60	6.10	5.05	5.29	5.36	590.0	235	412.5	3.75	3.61	14.60	7.8	0.50
71	LRB-244	5.20	4.40	4.26	5.37	5.14	5.21	5.06	4.26	250.0	195	222.5	3.0	2.86	12.80	8.2	0.50
72	LRB-245	5.50	5.80	5.66	6.73	5.64	5.09	5.75	5.66	465.0	310	387.5	3.0	2.86	13.56	8.2	0.40
73	LRB-247	5.40	4.20	4.06	5.93	5.78	4.87	5.24	4.06	210.0	315	262.5	3.0	2.86	11.76	9.6	0.50
74	LRB-248	5.60	5.20	5.06	5.75	5.40	5.38	5.47	5.06	500.0	300	400.0	3.0	2.86	10.50	10.6	0.50
75	LRB-254	5.30	5.90	5.76	5.78	6.26	5.79	5.81	5.76	400.0	320	360.0	3.4	3.26	14.14	8.2	0.40
76	LRB-257	5.10	5.25	5.11	5.69	8.26	6.84	6.23	5.11	250.0	430	340.0	2.6	2.46	6.10	15.6	0.50
77	LRB-258	5.40	5.90	5.76	5.79	5.70	5.83	5.72	5.76	490.0	400	445.0	2.8	2.96	12.60	10.0	0.40
78	LRB-262	5.30	6.40	6.26	6.18	4.52	6.73	5.83	6.26	225.0	425	325.0	2.8	2.96	8.44	10.0	0.50
79	LRB-263	5.20	5.30	5.16	6.59	5.50	5.09	5.54	5.16	200.0	360	280.0	2.6	2.76	8.50	10.0	0.40
80	LRB-264	5.50	5.00	4.86	5.94	5.12	6.73	5.66	4.86	340.0	300	320.0	2.0	2.16	12.80	13.6	0.50
81	LRB-265	5.40	4.75	4.61	6.55	5.45	6.63	5.76	4.61	450.0	290	370.0	3.40	3.56	10.30	8.6	0.50
82	LRB-266	5.60	4.80	4.66	5.89	7.68	7.45	6.28	4.66	430.0	215	322.5	2.8	2.96	10.40	5.0	0.40
83	LRB-269	5.00	4.20	4.98	5.77	4.68	6.68	5.27	4.98	265.0	230	247.5	3.2	3.36	15.05	7.4	0.50
84	LRB-270	5.40	4.70	5.48	5.20	5.67	7.00	5.59	5.48	292.0	340	316.0	3.0	3.16	11.90	11.0	0.50
85	LRB-271	5.20	5.30	6.08	6.76	5.72	7.09	6.01	6.08	225.0	290	257.5	2.8	2.96	10.78	9.4	0.40
86	LRB-272	5.50	5.90	6.68	5.09	5.76	6.78	5.81	6.68	320.0	340	330.0	3.0	3.16	13.56	7.4	0.50
87	LRB-273	5.30	5.60	6.38	5.56	5.11	5.72	5.46	6.38	375.0	325	350.0	2.4	2.56	10.72	8.6	0.60
88	LRB-275	5.60	5.40	6.18	5.33	4.91	6.62	5.57	6.18	580.0	290	435.0	3.25	3.41	11.46	7.4	0.50
89	LRB-276	5.20	5.00	5.78	6.58	5.70	6.27	5.75	5.78	215.0	280	247.5	2.6	2.76	8.30	9.6	0.40
90	LRB-278	5.40	4.80	5.58	4.80	5.60	6.92	5.50	5.58	520.0	315	417.5	3.4	3.56	13.48	7.6	0.50

S.No.	Accession No,	Plant height (cm)								No. of branches per plant								
		Bangalore	Rahuri	Ranchi	Ludhiana		Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi		Bhubaneswar	Mean	
		Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.
91	LRB-279	23.60	86.00	99.00	75.00	75.88	123.93	72.20	79.96	75.88	1.60	2.60	3.30	3.20	3.75	3.64	2.80	2.88	3.64
92	LRB-281	30.40	89.00	75.60	95.00	97.54	142.20	63.80	82.67	97.54	2.30	2.50	2.40	2.70	3.60	3.49	2.60	2.68	3.49
93	LRB-283	28.60	85.00	112.30	83.00	85.54	126.60	56.80	82.05	85.54	2.10	3.00	2.60	2.20	3.80	3.69	2.00	2.62	3.69
94	LRB-286	22.00	86.00	91.00	90.00	92.54	157.20	62.00	84.70	92.54	2.40	2.60	2.40	3.00	4.20	4.09	2.00	2.77	4.09
95	LRB-290	30.20	86.00	104.60	73.00	75.54	155.45	60.80	85.01	75.54	2.30	2.40	2.60	1.50	4.65	4.54	1.40	2.48	4.54
96	LRB-297	22.70	88.00	101.00	65.00	67.54	139.20	58.60	79.08	67.54	2.30	2.40	1.60	2.70	4.00	3.89	1.80	2.47	3.89
97	LRB-298	26.60	93.00	100.60	57.00	59.54	149.60	63.20	81.67	59.54	2.30	2.60	2.00	2.20	4.20	4.09	1.20	2.42	4.09
98	LRB-300	26.00	82.00	79.60	72.00	74.54	126.58	45.40	71.93	74.54	2.30	2.60	3.30	2.70	3.40	3.29	1.20	2.58	3.29
99	LRB-301	19.10	90.00	85.60	76.00	78.54	147.58	48.80	77.85	78.54	1.90	2.40	2.00	3.20	3.80	3.69	1.00	2.38	3.69
100	LRB-304	24.70	91.00	98.30	76.00	78.54	134.80	64.60	81.57	78.54	1.50	2.60	2.30	2.70	3.60	3.49	1.60	2.38	3.49
Means for check varieties																			
	RBL-1	22.60	104.00	91.92	-	-	-	61.52	70.01	-	1.60	2.50	2.60	-	-	-	2.00	2.18	-
	RBL-6	19.00	103.00	81.28	91.63	-	140.26	62.26	82.90	-	1.60	3.02	2.65	2.66	4.36	-	2.36	2.78	-
	RBL-35	21.00	103.00	71.00	98.13	-	146.28	70.86	85.04	-	1.80	2.65	2.23	2.88	4.43	-	2.34	2.72	-
	RBL-50	28.00	104.00	82.45	92.88	-	132.40	55.20	82.49	-	1.80	2.46	3.25	2.75	4.07	-	1.96	2.72	-
	Minimum	**16.40**	**72.00**	**20.00**	**57.00**	**-**	**108.00**	**31.20**	**50.77**	**-**	**1.10**	**2.10**	**1.00**	**0.50**	**3.00**	**-**	**1.00**	**1.45**	**-**
	Maximum	**34.50**	**108.00**	**112.30**	**139.00**	**-**	**188.00**	**111.00**	**115.47**	**-**	**3.00**	**3.40**	**4.30**	**4.00**	**6.00**	**-**	**4.60**	**4.22**	**-**
	Mean	**25.00**	**81.66**	**67.72**	**92.22**	**-**	**142.62**	**72.86**	**80.35**	**-**	**1.85**	**2.64**	**2.52**	**2.59**	**4.28**	**-**	**2.27**	**2.69**	**-**
	CD (0.05)	**-**	**-**	**23.84**	**38.51**	**-**	**49.26**	**20.53**	**33.03**	**-**	**-**	**-**	**1.15**	**1.43**	**1.21**	**-**	**0.73**	**1.13**	**-**
	CV (%) Error	**-**	**-**	**11.35**	**15.52**	**-**	**13.77**	**12.31**	**-**	**-**	**-**	**-**	**16.71**	**19.63**	**11.00**	**-**	**12.64**	**-**	**-**
	CV (%) Pheno.	**15.68**	**13.39**	**29.30**	**16.54**	**-**	**11.21**	**23.15**	**6.91**	**-**	**19.76**	**11.35**	**26.28**	**25.46**	**14.16**	**-**	**32.64**	**9.65**	**-**

S.No.	Accession No,	Days to 50% flowering										Days to maturity						
		Bangalore	Rahuri	Ranchi		S.K. Nagar	Ludhiana	Delhi	Bhubaneswar	Mean		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean
		Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
91	LRB-279	42.0	48	45	45.33	63.00	58	87	60	57.57	45.33	76.5	89	103	107	113.0	93	96.9
92	LRB-281	47.0	47	55	55.33	65.00	63	86	60	60.43	55.33	77.5	87	104	106	127.0	93	99.1
93	LRB-283	46.0	46	59	59.33	62.00	64	89	60	60.86	59.33	76.0	85	109	107	121.0	104	100.3
94	LRB-286	44.5	48	60	60.33	59.00	67	93	60	61.64	60.33	77.5	88	110	110	128.0	104	102.9
95	LRB-290	42.5	45	49	49.33	78.00	63	91	61	61.36	49.33	77.5	87	108	105	130.0	104	101.9
96	LRB-297	41.0	47	47	47.33	72.00	65	89	48	58.43	47.33	77.5	89	106	107	120.0	84	97.3
97	LRB-298	44.5	45	48	48.33	61.00	64	89	48	57.07	48.33	77.5	87	105	108	127.0	84	98.1
98	LRB-300	39.0	48	47	47.33	60.00	64	83	48	55.57	47.33	76.5	86	106	105	127.0	84	97.4
99	LRB-301	44.5	47	48	48.33	69.00	64	85	48	57.93	48.33	76.5	84	105	106	127.0	84	97.1
100	LRB-304	41.5	48	53	53.33	57.00	65	90	50	57.79	53.33	76.5	85	110	107	128.0	84	98.4
Means for check varie																		
	RBL-1	45.0	45.00	56.67	-	65.10	-	-	58.40	54.03	-	74.0	89.00	108.17	-	-	93.40	91.1
	RBL-6	42.0	48.00	57.33	-	-	63.75	86.67	62.40	60.03	-	79.0	87.00	107.33	108.88	127.44	101.00	101.8
	RBL-35	44.0	46.00	51.67	-	64.10	56.25	80.44	57.40	57.12	-	74.0	86.00	103.00	106.00	124.33	94.40	98.0
	RBL-50	37.0	45.00	59.67	-	65.50	65.13	89.33	52.20	59.12	-	74.0	85.00	107.17	110.63	127.11	85.00	98.2
	Minimum	**37.0**	**41.00**	**45.00**	**-**	**56.00**	**55.00**	**74.00**	**48.00**	**50.86**	**-**	**74.0**	**84.00**	**1.70**	**105.00**	**113.00**	**84.00**	**77.0**
	Maximum	**50.0**	**56.00**	**63.00**	**-**	**80.00**	**68.00**	**93.00**	**70.00**	**68.57**	**-**	**80.2**	**89.00**	**112.00**	**115.00**	**137.00**	**104.00**	**106.2**
	Mean	**43.3**	**45.50**	**54.57**	**-**	**65.11**	**63.43**	**87.97**	**58.10**	**59.71**	**-**	**76.4**	**86.59**	**104.29**	**109.25**	**129.01**	**95.46**	**100.2**
	CD (0.05)	**-**	**-**	**8.22**	**-**	**17.52**	**4.79**	**8.33**	**5.51**	**8.87**	**-**	**-**	**-**	**6.51**	**7.02**	**16.45**	**2.00**	**8.0**
	CV (%) Error	**-**	**-**	**5.67**	**-**	**10.61**	**2.95**	**3.77**	**3.58**	**-**	**-**	**-**	**-**	**2.38**	**2.46**	**5.01**	**0.80**	**-**
	CV (%) Pheno.	**5.84**	**4.80**	**8.26**	**-**	**8.28**	**4.18**	**4.67**	**9.46**	**3.32**	**-**	**1.98**	**1.75**	**10.34**	**2.95**	**3.29**	**7.52**	**2.70**

S.No.	Accession No,	Seed yield (g/plant)							No. of pods/plant							
		Bangalore	Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean	Bangalore	Ranchi	Adj.	Delhi	Bhubaneswar		Mean	
		Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Adj.	Obs.	Adj.
91	LRB-279	0.78	2.80	5.20	9.70	14.0	7.80	6.71	2.2	24.30	17.57	34.50	24.4	23.47	21.35	20.52
92	LRB-281	0.62	2.50	4.80	8.00	24.0	7.67	7.93	2.4	19.60	12.87	54.40	25.2	24.27	25.40	18.57
93	LRB-283	0.46	2.60	6.80	13.70	18.0	6.85	8.07	1.0	28.00	21.27	56.40	15.8	14.87	25.30	18.07
94	LRB-286	0.74	2.80	6.20	14.70	21.0	4.47	8.32	2.2	28.00	21.27	66.20	10.2	9.27	26.65	15.27
95	LRB-290	1.02	2.10	5.90	8.70	20.0	7.20	7.49	5.8	25.30	18.57	59.00	18.4	17.47	27.13	18.02
96	LRB-297	0.66	2.90	5.70	7.50	28.0	7.10	8.64	2.6	25.60	18.87	59.20	21.4	20.47	27.20	19.67
97	LRB-298	1.00	2.40	5.20	7.20	22.0	6.75	7.43	1.6	20.30	13.57	61.80	14.8	13.87	24.63	13.72
98	LRB-300	0.44	2.30	6.40	16.00	20.0	6.97	8.69	0.2	26.00	19.27	46.20	14.4	13.47	21.70	16.37
99	LRB-301	0.40	2.10	5.80	11.20	18.0	7.10	7.43	1.2	26.00	19.27	63.60	18.8	17.87	27.40	18.57
100	LRB-304	0.36	2.40	6.40	11.20	19.0	7.52	7.81	10.6	23.30	16.57	47.80	25.0	24.07	26.68	20.32
Means for check varie																
	RBL-1	1.10	2.60	6.37	-	-	7.32	4.35	2.2	21.17	-	-	17.26	-	13.54	-
	RBL-6	1.20	2.80	7.53	10.26	18.67	6.26	7.79	2.4	21.02	-	54.65	16.96	-	23.76	-
	RBL-35	1.40	2.70	8.23	13.84	17.11	7.30	8.43	2.6	16.95	-	59.43	19.02	-	24.50	-
	RBL-50	1.30	2.50	8.10	10.06	19.00	6.54	7.92	2.5	22.73	-	59.09	20.24	-	26.14	-
	Minimum	**0.2**	**1.90**	**2.60**	**4.50**	**8.00**	**4.23**	**3.57**	**0.2**	**6.50**	**-**	**33.00**	**10.20**	**-**	**12.48**	**-**
	Maximum	**3.1**	**3.20**	**8.60**	**30.00**	**33.50**	**10.58**	**14.82**	**10.6**	**29.60**	**-**	**105.00**	**36.20**	**-**	**45.35**	**-**
	Mean	**0.6**	**2.61**	**5.96**	**11.58**	**20.04**	**6.88**	**7.95**	**2.7**	**18.99**	**-**	**64.00**	**21.86**	**-**	**26.88**	**-**
	CD (0.05)	**-**	**-**	**2.06**	**10.65**	**12.28**	**1.62**	**6.65**	**-**	**8.96**	**-**	**46.59**	**4.32**	**-**	**19.96**	**-**
	CV (%) Error	**-**	**-**	**10.59**	**35.51**	**25.33**	**8.84**	**-**	**-**	**17.03**	**-**	**30.76**	**8.80**	**-**	**-**	**-**
	CV (%) Pheno.	**56.77**	**9.16**	**16.62**	**41.16**	**25.44**	**18.89**	**17.53**	**75.26**	**25.51**	**-**	**24.40**	**24.09**	**-**	**17.42**	**-**

S.No.	Accession No,	Seeds per pod								Pod length (cm)							
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Rahuri	Ranchi	Ludhiana	Delhi	Bhubaneswar	Mean		
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.		
91	LRB-279	5.40	8.60	8.29	7.20	8.25	6.3	7.15	8.29	5.50	7.60	7.60	7.25	8.6	7.31		
92	LRB-281	5.40	8.50	8.19	6.40	8.00	6.6	6.98	8.19	5.40	8.30	8.40	8.54	8.7	7.87		
93	LRB-283	5.40	9.30	8.99	7.00	7.40	7.6	7.34	8.99	5.40	8.00	8.00	7.78	8.4	7.52		
94	LRB-286	4.60	9.30	8.99	7.20	8.40	6.2	7.14	8.99	5.50	9.00	7.00	9.26	8.3	7.81		
95	LRB-290	5.40	8.60	8.29	6.60	9.00	5.6	7.04	8.29	5.60	7.30	7.00	12.15	9.9	8.39		
96	LRB-297	5.20	9.60	9.29	6.80	8.20	7.0	7.36	9.29	5.40	9.00	7.00	8.62	7.6	7.52		
97	LRB-298	4.60	8.00	7.69	7.00	5.80	6.8	6.44	7.69	5.50	7.30	7.60	8.70	7.8	7.38		
98	LRB-300	4.80	8.00	7.69	5.80	8.40	7.0	6.80	7.69	5.70	7.00	8.00	9.08	8.2	7.60		
99	LRB-301	5.60	9.30	8.99	6.40	8.40	6.9	7.32	8.99	5.40	8.30	8.00	8.90	8.6	7.84		
100	LRB-304	5.20	9.60	9.29	8.00	8.60	6.7	7.62	9.29	5.50	8.00	8.40	9.34	7.5	7.75		
Means for check varie																	
	RBL-1	5.13	8.45	-	-	-	7.10	6.89	-	5.50	8.33	-	-	8.70	7.51		
	RBL-6	4.61	8.42	-	6.95	8.27	6.42	6.93	-	5.30	7.95	7.75	8.95	8.82	7.75		
	RBL-35	4.71	8.22	-	7.15	8.22	6.64	6.99	-	5.40	7.90	8.01	8.60	8.32	7.65		
	RBL-50	5.33	8.57	-	6.68	8.34	6.76	7.14	-	5.50	8.27	7.90	8.61	8.22	7.70		
	Minimum	**4.20**	**6.40**	**-**	**5.00**	**5.80**	**5.10**	**5.30**	**-**	**5.30**	**5.60**	**6.40**	**7.20**	**6.50**	**6.20**		
	Maximum	**6.20**	**10.00**	**-**	**9.40**	**10.60**	**8.50**	**8.94**	**-**	**7.00**	**9.00**	**9.00**	**12.15**	**10.00**	**9.43**		
	Mean	**5.22**	**8.42**	**-**	**7.08**	**8.68**	**6.92**	**7.26**	**-**	**5.54**	**7.39**	**7.91**	**8.91**	**8.37**	**7.62**		
	CD (0.05)	**-**	**1.27**	**-**	**2.73**	**2.68**	**0.67**	**1.84**	**-**	**-**	**1.10**	**1.52**	**1.68**	**0.72**	**1.25**		
	CV (%) Error	**-**	**5.88**	**-**	**14.97**	**12.48**	**3.73**	**-**	**-**	**-**	**5.26**	**7.31**	**7.47**	**3.17**	**-**		
	CV (%) Pheno.	**8.48**	**8.33**	**-**	**13.32**	**10.51**	**9.74**	**4.78**	**-**	**4.14**	**10.24**	**8.29**	**7.76**	**6.92**	**3.44**		

S.No.	Accession No,	100 grain weight (g)								Seed yield per plot			Delhi			Bhubaneswar	Rahuri
		Rahuri	Ranchi		Ludhiana	Delhi	Bhubaneswar	Mean		Delhi	Bhubaneswar	Mean	No. of pods per cluster		Pedincle length (cm)	Clusters per plant	Stem girth (cm)
		Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.	Obs.	Adj.	Obs.	Obs.	Obs.
91	LRB-279	6.00	4.20	4.98	5.99	4.65	5.95	5.36	4.98	300.0	335	317.5	3.0	3.16	8.48	6.8	0.50
92	LRB-281	5.40	3.90	4.68	5.99	4.94	6.56	5.36	4.68	435.0	315	375.0	3.8	3.96	14.14	7.2	0.40
93	LRB-283	5.60	4.80	5.58	6.76	5.43	6.68	5.85	5.58	280.0	300	290.0	4.2	4.36	14.30	6.2	0.50
94	LRB-286	5.30	3.70	4.48	5.42	7.75	5.84	5.60	4.48	440.0	150	295.0	3.0	3.16	11.74	9.0	0.50
95	LRB-290	5.70	5.90	6.68	5.42	6.12	6.39	5.91	6.68	425.0	225	325.0	3.3	3.41	9.25	7.0	0.40
96	LRB-297	5.30	5.20	5.98	5.14	4.96	5.42	5.20	5.98	550.0	230	390.0	3.4	3.56	13.78	9.0	0.50
97	LRB-298	5.50	5.00	5.78	5.41	5.90	5.81	5.52	5.78	425.0	180	302.5	3.0	3.16	11.95	8.2	0.40
98	LRB-300	5.10	3.80	4.58	6.35	4.92	5.77	5.19	4.58	385.0	210	297.5	3.0	3.16	14.58	6.4	0.50
99	LRB-301	5.80	5.40	6.18	5.58	5.60	5.74	5.62	6.18	370.0	215	292.5	3.2	3.36	15.14	9.4	0.50
100	LRB-304	5.40	4.40	5.18	6.56	5.14	5.70	5.44	5.18	390.0	290	340.0	2.75	2.91	13.06	10.2	0.40
Means for check varie																	
	RBL-1	5.60	5.62	-	-	-	5.34	5.52	-	-	340.00	340.0	-	-	-	9.58	0.40
	RBL-6	5.20	6.17	-	5.09	4.92	6.30	5.53	-	463.33	293.00	378.2	3.04	-	12.08	10.58	0.40
	RBL-35	5.40	6.47	-	5.83	5.12	5.36	5.64	-	385.56	369.00	377.3	3.53	-	13.62	11.52	0.50
	RBL-50	5.50	6.20	-	5.43	4.97	5.48	5.52	-	392.78	319.00	355.9	2.91	-	11.21	10.86	0.40
	Minimum	**5.00**	**3.70**	**-**	**4.60**	**4.26**	**4.43**	**4.40**	**-**	**175.00**	**150.00**	**162.5**	**2.00**	**-**	**6.10**	**5.00**	**0.30**
	Maximum	**6.00**	**6.47**	**-**	**7.08**	**8.28**	**7.66**	**7.10**	**-**	**650.00**	**480.00**	**565.0**	**6.00**	**-**	**22.50**	**24.40**	**0.60**
	Mean	**5.38**	**5.02**	**-**	**5.83**	**5.74**	**5.81**	**5.55**	**-**	**411.73**	**302.08**	**356.9**	**3.41**	**-**	**13.17**	**11.36**	**0.47**
	CD (0.05)	**-**	**0.98**	**-**	**1.39**	**2.05**	**0.79**	**1.30**	**-**	**447.02**	**76.41**	**261.7**	**1.16**	**-**	**5.98**	**3.92**	**-**
	CV (%) Error	**-**	**6.21**	**-**	**9.71**	**15.90**	**5.25**	**-**	**-**	**40.64**	**8.67**	**-**	**14.15**	**-**	**18.77**	**13.80**	**-**
	CV (%) Pheno.	**4.02**	**13.77**	**-**	**10.34**	**13.53**	**12.14**	**4.73**	**-**	**24.89**	**24.66**	**16.55**	**22.97**	**-**	**21.61**	**37.02**	**12.54**

Table 123. 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 235)				
1.	Days to 50% flowering	57.00-98.00	Mutant-1, IC-248945, IC-331587, EC-329673, IC-348948, EC-034710, EC-243791, IC-361497 (<61.00 days)	PRT-1 (64.08 days)
2.	Days to maturity	138.00-191.00	Mutant-1, IC-331549, IC-361497, HB-021, EC-243624, HB-024, HB-057, EC-329662, IC-332138, HB-202 (<165.00 days)	PRT-7 (165.31 days)
3.	Plant height (cm)	26.60-145.30	Mutant-2, Mutant-1, HB-024, HB-060 (>90.00cm)	Vikrant (63.43 cm)
4.	Number of primary branches	2.00-15.00	Mutant-1, Mutant-2, EC-243784, EC-329638 , HB-074, EC-329710, HB-082, EC-117726, EC-329696, EC-343808, HB-180, (> 6.00)	Vikran (4.67)
5.	Cluster/plant	7.00-91.00	Mutant-1, EC-010719, HB-019, HB-028, EC-329638, HB-060, (>37.00)	PRT-7 (22.15)
6.	Plot/pod	12.00-139.00	Mutant-1, Mutant-2, EC-032790, EC-329662, EC-243608, EC-293713 (>57.00)	PRT-12 (37.25)
7.	Panicle length (cm)	3.90-7.80	Mutant-2, HB-072, Mutant-1, EC-243772, EC-329662, EC-243624, (>5.8 cm)	Vikrant (4.81 cm)
8.	Test weight (g)	21.00-92.00	HB-019, EC-329708, HB-020, EC-117748, HB-026, EC-117818, EC-323731, EC-329648, EC-248710, EC-243594, HB-062, Mutant-1, EC-243860, EC-243860, HB-081, HB-058, EC-243772, EC-117795, EC-343855, EC-329667 (>32.7 g)	Vikrant (26.93 g)
9.	Seed yield/plant (g)	8.10-300.00	IC-366272, HB-070, HB-062, IC-267646, IC-361499, HB-069, EC-329673, HB-073, HB-075, HB-066, Mutant-1, HB-025, IC-331587, HB-071, HB-081, HB-019, HB-064, IC-361427, HB-067, IC-347914, EC-117795, EC-117765, IC-267645, EC-025085, HB-059, HB-082, IC-361470, EC-243624, EC-329588 (> 170.5)	Vikran (65.16 g)
10.	Seed/pod	3.00-4.00	EC-321003 (>3.00)	PRT-7 (3.08)
Faizabad (Accessions 110)				
1.	Days to flowering	56.00-87.00	EC267639, EC243756, EC243761, EC329680, HT-43, IC348948, GP-13, EC117748, EC243782 (<63.00 days)	P R T 12 (71.10 days)
2.	Days to maturity	153.00-175.00	EC329715, EC243772, EC329677, EC243770, GP-12, EC299713, EC025072, HT-41, EC243764 (< 160.00 days)	P R T (164.90 days)

3.	Plant height (cm)	44.00-74.80	EC329677, EC243596, EC329715, EC329662, EC361496, EC117744, EC267639, EC117792, EC299713 (> 67.00 cm)	P R T 12 (62.06 cm)
4.	No. of Branches/plant	2.20-7.00	IC332102, EC243525A, EC329715, EC351999, EC243782, EC343808, EC025192, EC343793 (> 5.6)	V H 82-1 (4.48)
5.	No. of Pods/plant	5.10-60.80	EC117726, EC329724, EC329715, EC343855, EC117795, EC329677, EC267649, EC010720, EC117744, EC243786, EC329725 (> 52.00)	V H 82-1 (39.57)
6.	Pod length (cm)	2.80-5.20	EC343631, EC243764, EC354985, EC329679, EC329707, EC247592, EC117744, EC329680 (> 4.50 cm)	P R T 7 (4.31 cm)
7.	No. of grain/pod	2.00-5.40	EC343631, IC361494 (>3.60)	P R T 12 (3.11)
8.	100 seed weight (g)	21.00-32.60	EC329696, EC329662, EC329680, EC243637, EC034710, EC329715, EC243756, GP-04, EC243584, EC329628 (> 31.4 g)	P R T 12 (28.45 g)
9.	Yield Q/ha	4.10-28.70	EC299713, EC329724 (> 25.62 Q/ha)	P R T 12 (12.94 Q/ha)
Delhi (Accessions 142)				
1.	Days to flower	52.0-115.0	KP/DS-46, BGR-89, VKS18/46 (> 85.0 days)	PRT-7 (72.50 days)
2.	Days to 50% flowering	67.0-120.0	IC361496, EC329691, EC550179, EC117724 (< 75.0 days)	PRT-12 (89.10 days)
3.	Days to maturity	150.0-172.0	VKG29/64, IC361499 (< 152.0 days)	PRT-12 (158.10 days)
4.	Plant height (cm)	79.0-95.0	No Accessions	PRT-12 (78.76 cm)
5.	No. of branches	2.0-17.0	JBT30/78, JBT42/RP-3/31, VKS18/46, BGR-82, VKG29/91 (> 10.0)	PRT-12 (5.72)
6.	Pods per plant	2.38-81.40	JBT42/RP-3/31, EC329725, VKG29/53 (> 58.0)	Vikrant (37.05)
7.	No. of grains per pod	1.40-4.0	JBT30/78 (> 3.85)	Vikrant (2.99)
8.	No. of pods per cluster	1.0-2.80	EC267641, IC346272, JBT42/RP-3/28, EC267648, JBT41/80, JBT42/RP-3/31, IC332102, VKG29/53 (> 1.50)	Vikrant (1.37)
9.	Pod length (cm)	2.50-7.20	VKS18/46, JBT30/78 (> 6.0 cm)	PRT-12 (4.12 cm)
10.	Leaf length (cm)	4.62-7.70	No Accessions	PRT-7 (6.46 cm)

11.	Leaf width (cm)	2.24-3.60	EC25192 (>3.50 cm)	PRT-7 (2.93 cm)
12.	100 seed weight (g)	2.0-36.50	EC343808, EC329679 (> 34.50 g)	PRT-12 (25.15 g)
13.	Yield per plant (g)	1.0-100.0	EC243756 (> 40.0 g)	PRT-12 (22.80 g)
14.	Yield (q/ha)	0.37-33.89	EC243770, EC117792, EC329725 (> 30.0 q/ha)	PRT-12 (15.65 q/ha)

Table 124. Multilocation evaluation of germplasm lines in faba bean at Hisar - 2006 (Plains)

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
1	BLMK-5-7	98	178	67.60	3	2.03	15.00	32.00	4.50	27.80	82.60	3
3	BSH-9	65	171	64.60	4	3.03	20.00	28.00	4.40	28.70	50.60	3
2	BSH-42	71	175	55.30	4	3.03	18.00	23.00	4.60	27.50	80.00	3
4	EC-005864	81	169	55.30	3	2.03	13.00	42.00	4.70	31.50	50.00	3
5	EC-007853	74	170	41.00	3	2.03	19.00	38.00	4.50	29.10	21.50	3
6	EC-010719	87	180	69.60	5	4.03	43.00	54.00	5.20	30.50	10.10	3
7	EC-010720	76	178	63.00	3	2.03	19.00	30.00	4.60	25.00	29.00	3
8	EC-010845	79	171	60.30	5	4.03	12.00	26.00	4.50	25.90	59.10	3
9	EC-025072	88	177	56.00	3	2.03	10.00	27.00	5.20	30.20	15.00	3
10	EC-025085	92	185	58.60	4	3.03	19.00	45.00	4.50	31.00	180.60	3
11	EC-025088	78	167	61.30	4	3.03	17.00	41.00	5.10	25.70	72.90	3
12	EC-025192	73	177	59.30	4	3.03	20.00	37.00	4.70	23.90	89.20	3
13	EC-032790	65	172	83.00	5	4.03	36.00	80.00	5.30	29.50	120.60	3
14	EC-032905	87	184	46.00	4	3.03	13.00	32.00	4.20	26.10	76.60	3
15	EC-034710	60	180	58.30	5	4.03	22.00	29.00	4.50	24.40	18.60	3
16	EC-107842	74	180	56.30	4	3.03	18.00	33.00	4.60	28.20	91.60	3
17	EC-108908	81	165	58.30	4	3.03	11.00	27.00	4.90	25.90	100.60	3
18	EC-117361	74	180	50.00	4	3.03	16.00	29.00	4.50	24.90	72.40	3
19	EC-117705	83	184	56.50	3	2.03	18.00	42.00	5.30	30.20	150.10	3
20	EC-117720	72	174	57.30	4	4.03	20.00	33.00	4.60	23.70	100.40	3
21	EC-117724	81	181	56.00	4	4.03	19.00	36.00	4.30	28.80	105.00	3
22	EC-117726	78	178	64.30	7	7.03	26.00	54.00	4.60	28.60	39.20	3
23	EC-117727	75	180	68.60	5	5.03	18.00	43.00	4.60	31.90	102.60	3
24	EC-117734	78	176	70.30	4	4.03	19.00	33.00	4.70	28.60	100.00	3
25	EC-117739	81	179	79.60	4	4.03	25.00	54.00	4.60	25.80	51.80	3
26	EC-117741	81	174	82.60	4	4.03	18.00	36.00	5.10	32.20	100.50	3
27	EC-117744	64	165	47.60	6	6.03	20.00	41.00	4.70	29.40	59.60	3
28	EC-117745	87	185	64.30	4	4.03	27.00	45.00	5.60	30.10	50.40	3
29	EC-117748	70	170	59.00	5	5.03	13.00	36.00	4.60	37.10	170.40	3
30	EC-117749	65	175	54.30	4	4.03	15.00	31.00	5.10	26.50	100.10	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
31	EC-117753	77	170	69.00	4	4.03	19.00	44.00	5.10	31.50	156.20	3
32	EC-117755	70	172	61.30	6	6.03	24.00	39.00	4.60	27.90	62.00	3
33	EC-117758	80	179	40.60	4	4.03	17.00	32.00	4.30	27.30	80.50	3
34	EC-117765	77	177	54.60	6	6.03	20.00	44.00	4.70	28.20	190.50	3
35	EC-117784	75	180	47.60	3	3.03	12.00	24.00	4.40	28.40	61.00	3
36	EC-117792	85	171	52.60	3	3.03	12.00	31.00	4.40	26.50	90.40	3
37	EC-117795	65	171	60.00	4	4.03	16.00	36.00	5.10	33.20	199.00	3
38	EC-117799	68	174	68.60	4	4.03	21.00	32.00	4.90	24.60	13.90	3
39	EC-117818	77	176	45.60	3	2.03	15.00	35.00	4.00	35.80	99.50	3
40	EC-117842	67	184	73.00	4	3.03	16.00	32.00	5.10	29.30	18.10	3
41	EC-243012	85	184	71.00	4	3.03	11.00	32.00	5.20	23.80	150.00	3
42	EC-243036	84	175	64.60	4	3.03	18.00	38.00	5.00	23.70	160.00	3
43	EC-243524A	75	177	68.00	4	3.03	19.00	27.00	4.60	23.00	50.00	3
44	EC-243529	79	183	55.60	5	4.03	19.00	35.00	4.90	32.70	105.60	3
45	EC-243575	68	169	44.60	5	4.03	20.00	25.00	4.10	25.10	101.20	3
46	EC-243584	67	165	56.60	5	4.03	22.00	50.00	5.60	28.10	109.50	3
47	EC-243588	85	180	52.30	5	4.03	20.00	41.00	3.90	30.60	87.00	3
48	EC-243594	92	173	61.60	4	3.03	20.00	43.00	5.60	34.60	110.50	3
49	EC-243596	77	175	51.30	4	3.03	10.00	27.00	4.40	28.70	58.10	3
50	EC-243608	61	170	46.60	4	3.03	30.00	63.00	5.10	32.10	100.00	3
51	EC-243608	61	167	40.00	3	2.03	10.00	13.00	4.40	23.60	110.20	3
52	EC-243613	82	171	55.00	4	3.03	11.00	13.00	4.30	26.90	44.80	3
53	EC-243624	81	161	74.30	5	4.03	22.00	49.00	5.40	29.40	125.60	3
54	EC-243624	73	183	61.00	4	3.03	17.00	39.00	5.90	22.40	180.10	3
55	EC-243631	70	175	55.00	3	2.03	13.00	29.00	5.20	27.50	60.00	3
56	EC-243637	84	181	51.60	5	4.03	10.00	31.00	4.20	25.40	79.60	3
57	EC-243709	68	178	70.00	5	4.03	23.00	37.00	5.20	24.50	15.00	3
58	EC-243743	69	179	80.00	4	4.69	20.00	25.00	5.20	26.10	50.20	3
59	EC-243749	71	175	77.00	4	4.69	27.00	53.00	5.30	25.80	170.50	3
60	EC-243755	86	184	59.30	4	4.69	15.00	42.00	4.40	28.20	18.30	3
61	EC-243756	81	165	64.60	5	5.69	27.00	53.00	4.90	28.00	22.00	3
62	EC-243761	73	175	53.00	3	3.69	19.00	49.00	4.50	25.70	170.40	3
63	EC-243761	79	170	50.60	5	5.69	20.00	28.00	4.10	26.10	150.60	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
64	EC-243764	70	172	56.30	5	5.69	22.00	28.00	5.40	21.20	16.90	3
65	EC-243770	75	180	52.60	3	3.69	10.00	12.00	4.70	27.80	50.00	3
66	EC-243772	70	181	72.60	4	4.69	21.00	46.00	6.30	33.20	27.00	3
67	EC-243782	89	171	65.00	4	4.69	18.00	27.00	4.60	26.00	51.40	3
68	EC-243784	71	174	62.30	9	9.69	25.00	50.00	4.90	24.50	11.50	3
69	EC-243786	67	178	50.60	4	4.69	17.00	21.00	4.60	29.30	8.50	3
70	EC-243791	60	170	62.60	3	3.69	17.00	33.00	5.10	30.20	90.20	3
71	EC-243793	81	170	60.60	4	4.69	15.00	20.00	4.60	26.60	32.50	3
72	EC-243808	66	177	82.60	3	3.69	17.00	20.00	5.10	27.90	12.00	3
73	EC-243820	67	174	70.60	6	6.69	33.00	42.00	4.60	30.90	80.00	3
74	EC-243834	61	170	47.30	3	3.69	26.00	30.00	4.90	29.40	150.00	3
75	EC-243860	70	176	65.30	2	2.69	25.00	36.00	4.90	34.10	100.00	3
76	EC-243860	75	171	60.00	5	5.69	31.00	55.00	5.00	33.90	16.90	3
77	EC-243861	69	172	49.60	4	5.03	19.00	24.00	4.60	24.70	107.60	3
78	EC-243895	63	175	81.30	5	6.03	18.00	23.00	4.60	26.30	25.40	3
79	EC-247592	73	178	76.60	4	5.03	19.00	42.00	5.40	26.00	19.10	3
80	EC-247640	74	178	48.00	2	3.03	8.00	17.00	4.60	28.50	18.40	3
81	EC-247641	65	176	68.60	6	7.03	34.00	44.00	4.40	24.50	40.00	3
82	EC-248710	74	174	68.60	5	6.03	33.00	30.00	4.60	34.80	25.10	3
83	EC-248945	65	170	61.30	6	7.03	25.00	33.00	5.20	24.10	25.80	3
84	EC-248951	83	171	68.30	5	6.03	19.00	45.00	5.10	31.70	70.10	3
85	EC-248952	88	180	69.00	3	4.03	29.00	37.00	5.60	32.60	100.00	3
86	EC-249947	70	174	73.00	4	5.03	17.00	26.00	4.80	31.40	11.40	3
87	EC-251014	67	171	58.30	4	5.03	20.00	42.00	4.60	30.60	99.00	3
88	EC-267639	61	175	59.00	3	4.03	22.00	48.00	5.30	28.40	15.00	3
89	EC-267648	82	167	64.60	3	4.03	25.00	50.00	4.50	22.20	150.00	3
90	EC-267649	70	171	72.30	4	5.03	19.00	29.00	4.70	30.80	100.00	3
91	EC-293713	83	174	47.60	4	5.03	27.00	61.00	4.70	29.60	18.50	3
92	EC-321003	72	180	72.30	5	6.03	18.00	30.00	5.00	28.90	100.00	4
93	EC-322967	74	170	53.30	3	4.03	16.00	34.00	4.70	30.40	67.20	3
94	EC-323731	78	184	63.60	4	5.03	16.00	21.00	4.30	35.20	50.40	3
95	EC-324644	84	180	70.30	4	5.03	18.00	44.00	5.60	26.90	50.80	3
96	EC-324677	78	182	60.30	4	4.36	13.00	32.00	4.60	26.10	40.80	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
97	EC-329003	70	175	72.30	5	5.36	31.00	38.00	4.80	26.90	105.10	3
98	EC-329414	77	176	57.00	3	3.36	13.00	30.00	5.50	30.90	110.10	3
99	EC-329588	74	183	64.00	6	6.36	14.00	37.00	4.90	28.10	175.00	3
100	EC-329609	71	172	74.00	6	6.36	18.00	21.00	4.60	25.10	16.80	3
101	EC-329627	81	175	49.30	3	3.36	19.00	37.00	4.30	31.50	65.40	3
102	EC-329628	84	175	57.00	5	5.36	27.00	29.00	4.90	22.20	100.00	3
103	EC-329631	61	169	52.60	3	3.36	7.00	19.00	4.80	31.00	53.40	3
104	EC-329638	75	174	73.00	8	8.36	40.00	51.00	4.80	24.50	19.80	3
105	EC-329643	74	179	64.30	3	3.36	18.00	38.00	5.10	23.20	50.60	3
106	EC-329648	75	171	66.60	3	3.36	20.00	25.00	5.10	35.10	26.80	3
107	EC-329648	96	178	50.60	3	3.36	11.00	20.00	4.40	24.40	65.00	3
108	EC-329662	61	163	70.30	6	6.36	34.00	63.00	5.90	24.40	43.60	3
109	EC-329667	91	185	50.30	4	4.36	22.00	43.00	4.30	32.90	96.60	3
110	EC-329670	75	182	58.30	5	5.36	16.00	22.00	4.60	28.60	50.00	3
111	EC-329672	69	170	48.30	4	4.36	16.00	25.00	4.20	25.60	37.80	3
112	EC-329673	59	171	61.00	6	6.36	17.00	39.00	5.20	23.80	220.00	3
113	EC-329675	70	180	75.00	3	3.36	22.00	36.00	5.10	25.80	15.00	3
114	EC-329677	75	180	52.00	5	5.36	31.00	35.00	5.70	25.60	22.40	3
115	EC-329679	74	175	62.00	3	3.69	11.00	34.00	4.90	32.40	70.50	3
116	EC-329680	70	181	59.60	6	6.69	19.00	46.00	4.90	30.50	15.80	3
117	EC-329681	74	175	64.30	4	4.69	21.00	50.00	4.50	31.40	29.10	3
118	EC-329682	72	179	72.00	4	4.69	20.00	45.00	5.80	31.20	155.40	3
119	EC-329683	80	174	70.00	4	4.69	19.00	44.00	5.40	26.10	28.60	3
120	EC-329691	71	165	57.60	4	4.69	14.00	32.00	4.50	26.80	130.40	3
121	EC-329693	64	170	48.60	4	4.69	19.00	21.00	4.60	21.80	66.60	3
122	EC-329695	75	177	55.60	4	4.69	24.00	29.00	5.10	25.40	17.50	3
123	EC-329696	85	184	56.60	7	7.69	22.00	42.00	4.90	26.80	44.50	3
124	EC-329700	75	174	58.00	5	5.69	15.00	26.00	4.60	28.00	20.00	3
125	EC-329707	85	179	66.60	4	4.69	25.00	55.00	4.30	23.90	120.40	3
126	EC-329708	67	173	38.60	3	3.69	10.00	20.00	4.30	43.20	25.90	3
127	EC-329710	91	177	68.30	7	7.69	21.00	52.00	5.40	27.60	35.50	3
128	EC-329712	68	171	64.30	2	2.69	11.00	31.00	4.30	23.60	61.50	3
129	EC-329713	71	175	67.60	6	6.69	10.00	26.00	5.20	27.40	150.20	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
130	EC-329715	75	185	52.00	4	4.69	22.00	44.00	4.40	30.90	50.40	3
131	EC-329723	73	180	66.60	5	5.69	20.00	48.00	4.50	28.10	13.60	3
132	EC-329723	70	171	60.60	5	5.69	28.00	33.00	4.20	23.60	56.20	3
133	EC-329724	62	169	55.60	6	6.69	15.00	34.00	4.40	26.40	15.50	3
134	EC-329725	75	177	59.60	3	3.69	11.00	29.00	5.20	27.40	120.60	3
135	EC-329728	70	169	59.30	3	3.69	21.00	49.00	5.80	26.90	100.00	3
136	EC-329812	67	174	58.30	3	3.69	28.00	37.00	5.20	28.50	50.00	3
137	EC-343696	65	172	43.60	4	4.69	14.00	25.00	5.10	24.40	50.40	3
138	EC-343749	71	174	71.00	3	3.69	13.00	26.00	5.10	27.50	31.60	3
139	EC-343793	84	176	60.30	4	4.69	20.00	45.00	4.50	29.40	110.00	3
140	EC-343808	76	168	53.30	7	7.69	16.00	28.00	4.70	28.90	24.40	3
141	EC-343855	84	183	65.00	4	4.69	31.00	38.00	5.10	32.90	15.70	3
142	EC-351999	90	182	55.00	3	3.69	18.00	37.00	4.70	31.80	10.40	3
143	EC-354951	63	166	41.30	3	3.69	9.00	18.00	4.30	31.00	50.60	3
144	EC-354984	83	181	56.00	6	6.69	29.00	57.00	5.20	31.50	29.40	3
145	EC-354985	78	181	37.60	2	2.69	13.00	28.00	4.90	31.50	158.00	3
146	EC-359685	65	180	87.30	4	4.69	21.00	26.00	5.10	31.80	70.50	3
147	EC-361487	86	173	69.00	4	4.69	15.00	30.00	5.20	27.80	110.50	3
148	EC-374731	84	175	46.30	4	4.69	32.00	38.00	5.20	32.30	56.00	3
149	EC-382423	70	179	68.30	6	6.69	19.00	41.00	5.10	27.50	90.20	3
150	HB-001	65	170	62.30	3	3.69	19.00	25.00	4.80	22.50	111.10	3
151	HB-003	84	183	62.50	4	4.69	13.00	40.00	5.20	21.90	8.10	3
152	HB-017	65	170	69.60	5	5.69	30.00	39.00	4.80	22.70	13.20	3
153	HB-018	69	175	66.60	5	5.36	32.00	44.00	4.80	26.60	32.60	3
154	HB-019	71	170	68.30	6	6.36	41.00	49.00	5.20	92.00	200.00	3
155	HB-020	89	186	71.60	6	6.36	33.00	42.00	4.80	39.20	156.00	3
156	HB-021	69	161	81.00	5	5.36	31.00	38.00	5.40	25.60	71.60	3
157	HB-022	65	167	71.00	6	6.36	29.00	39.00	5.20	24.60	120.50	3
158	HB-023	65	167	74.30	5	5.36	25.00	34.00	4.90	30.40	94.20	3
159	HB-024	63	162	96.60	4	4.36	20.00	26.00	5.30	24.10	13.90	3
160	HB-025	69	169	67.00	4	4.36	29.00	34.00	5.20	26.50	200.40	3
161	HB-026	66	169	78.30	4	4.36	21.00	29.00	5.60	36.60	25.00	3
162	HB-027	67	169	64.00	5	5.36	31.00	41.00	5.50	30.70	50.60	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
163	HB-028	75	184	70.00	5	5.36	41.00	48.00	5.30	26.30	106.10	3
164	HB-029	71	184	72.00	6	6.36	26.00	33.00	5.40	22.40	105.00	3
165	HB-052	71	181	47.30	3	3.36	12.00	21.00	4.10	32.70	15.60	3
166	HB-053	69	165	53.60	3	3.36	26.00	33.00	4.60	28.10	106.20	3
167	HB-054	68	170	64.00	5	5.36	28.00	36.00	4.90	24.60	25.20	3
168	HB-055	84	185	54.30	4	4.36	22.00	27.00	4.20	23.90	150.40	3
169	HB-056	72	165	45.00	3	3.36	14.00	20.00	4.40	21.00	125.60	3
170	HB-057	68	162	72.30	5	5.36	25.00	29.00	4.70	22.10	15.20	3
171	HB-058	86	187	62.60	3	3.36	19.00	26.00	4.60	33.50	100.20	3
172	HB-059	65	165	53.20	4	4.36	26.00	30.00	4.70	31.60	180.50	3
173	HB-060	87	189	93.00	6	4.69	40.00	46.00	4.60	26.40	166.70	3
174	HB-061	71	170	68.00	5	3.69	27.00	33.00	4.60	25.20	12.50	3
175	HB-062	65	165	56.00	5	3.69	28.00	37.00	4.30	34.60	260.00	3
176	HB-064	67	165	56.00	5	3.69	21.00	27.00	4.90	31.20	200.00	3
177	HB-065	89	166	54.60	4	2.69	25.00	29.00	4.20	28.10	150.40	3
178	HB-066	72	181	71.30	4	2.69	34.00	40.00	4.70	25.50	200.60	3
179	HB-067	88	187	68.60	4	2.69	37.00	40.00	4.90	28.80	200.00	3
180	HB-068	69	167	80.00	4	2.69	20.00	45.00	5.50	24.70	16.50	3
181	HB-069	75	171	73.60	4	2.69	20.00	30.00	4.80	27.50	250.00	3
182	HB-070	67	165	78.30	4	2.69	9.00	36.00	5.60	32.60	260.10	3
183	HB-071	65	169	66.30	3	1.69	31.00	37.00	5.50	28.60	200.20	3
184	HB-072	74	184	87.60	5	3.69	27.00	35.00	7.20	23.10	29.00	3
185	HB-073	85	189	80.00	4	2.69	22.00	30.00	5.30	24.60	206.00	3
186	HB-074	63	170	90.00	7	5.69	35.00	41.00	4.80	22.90	15.40	3
187	HB-075	64	170	89.00	6	4.69	29.00	34.00	5.50	26.10	200.60	3
188	HB-076	69	170	81.30	6	4.69	18.00	24.00	5.60	31.10	45.40	3
189	HB-077	75	170	86.30	4	2.69	20.00	26.00	5.50	22.50	38.60	3
190	HB-078	74	170	78.60	5	3.69	24.00	31.00	5.30	23.60	14.20	3
191	HB-079	63	166	84.00	6	4.69	31.00	39.00	5.00	31.40	102.40	3
192	HB-080	89	191	70.30	4	2.69	17.00	22.00	5.00	32.50	14.90	3
193	HB-081	67	165	78.60	5	3.69	31.00	37.00	5.20	33.50	200.10	3
194	HB-082	65	166	67.00	7	6.69	36.00	45.00	5.30	26.90	180.50	3
195	HB-083	75	180	69.60	5	4.69	30.00	39.00	4.80	23.80	10.90	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
196	HB-180	69	166	41.00	7	6.69	17.00	25.00	4.90	28.50	50.90	3
197	HB-181	82	184	50.60	4	3.69	27.00	33.00	4.90	30.40	100.90	3
198	HB-193	62	165	51.30	4	3.69	27.00	32.00	4.60	26.10	100.60	3
199	HB-202	74	163	55.30	5	4.69	26.00	32.00	4.40	27.10	100.50	3
200	HB-303	68	171	48.60	5	4.69	29.00	34.00	5.40	25.60	100.20	3
201	HB-504	72	169	26.60	4	3.69	10.00	18.00	4.60	26.80	102.40	3
202	HB-516	67	165	56.00	4	3.69	27.00	32.00	4.10	31.00	160.20	3
203	HB-518	71	172	45.30	5	4.69	25.00	32.00	5.30	25.10	112.40	3
204	IC-117809	61	167	54.00	4	3.69	15.00	27.00	5.40	23.80	159.50	3
205	IC-243781	86	185	63.30	3	2.69	18.00	36.00	4.80	27.60	150.20	3
206	IC-248945	58	165	48.30	3	2.69	15.00	33.00	4.60	23.80	150.70	3
207	IC-267642	74	177	62.60	4	3.69	22.00	46.00	4.90	25.60	120.60	3
208	IC-267644	85	174	58.60	3	2.69	15.00	33.00	4.60	25.90	150.60	3
209	IC-267645	84	180	54.00	4	3.69	15.00	38.00	4.50	24.90	182.00	3
210	IC-267646	73	180	56.30	4	3.69	18.00	26.00	4.40	31.80	260.00	3
211	IC-276639	70	170	64.30	3	2.69	28.00	56.00	4.80	29.50	15.10	3
212	IC-276643	89	183	56.60	5	4.69	18.00	40.00	4.40	24.50	85.80	3
213	IC-331549	67	156	41.60	2	1.69	10.00	14.00	4.40	30.60	150.00	3
214	IC-331561	71	173	46.60	3	2.69	8.00	17.00	4.00	26.50	95.00	3
215	IC-331564	85	185	48.60	4	3.69	21.00	44.00	4.20	25.10	60.80	3
216	IC-331571	71	175	47.60	2	1.69	13.00	14.00	4.10	25.10	11.90	3
217	IC-331587	58	170	55.30	3	2.69	21.00	28.00	5.20	31.00	200.20	3
218	IC-332102	68	170	46.00	4	3.69	21.00	19.00	5.20	23.20	150.00	3
219	IC-332138	64	163	55.30	2	1.69	13.00	30.00	4.40	27.90	81.00	3
220	IC-347914	64	172	43.60	4	3.69	32.00	39.00	5.00	28.40	200.00	3
221	IC-348948	59	171	50.60	4	3.69	13.00	25.00	4.70	23.70	15.70	3
222	IC-361426	70	175	56.60	4	3.69	12.00	30.00	4.30	28.20	12.40	3
223	IC-361427	82	177	53.00	5	4.69	21.00	27.00	4.40	29.60	200.00	3
224	IC-361438	71	170	55.60	3	2.69	27.00	46.00	5.10	27.10	50.00	3
225	IC-361470	77	181	61.60	4	3.69	22.00	54.00	4.60	28.60	180.40	3
226	IC-361485	73	177	54.00	5	4.69	23.00	27.00	4.40	25.60	156.20	3
227	IC-361490	80	175	52.00	5	4.69	24.00	28.00	4.70	29.20	20.00	3
228	IC-361494	72	180	53.30	3	2.69	19.00	33.00	5.10	30.80	50.10	3

Sr. No.	Entries	Days to 50% flowering	Days to matyurity	Plant height (cm)	No. of primary branches per plant		Cluster per pant	Pod per plant	Pod length (cm)	Test weight (g)	Seed yield/plant	Seed per pod
					Obs.	Adj.						
229	IC-361496	64	170	56.30	2	1.69	8.00	19.00	4.60	29.10	50.00	3
230	IC-361497	60	157	53.60	5	4.69	20.00	24.00	4.40	24.20	16.80	3
231	IC-361498	68	181	61.00	3	2.69	12.00	19.00	4.50	32.20	160.20	3
232	IC-361499	94	181	47.00	6	5.69	18.00	20.00	4.50	32.00	250.00	3
233	IC-366272	75	173	61.30	4	3.69	10.00	13.00	4.70	28.10	300.00	3
234	Mutant-1	57	138	132.60	15	14.69	91.00	139.00	6.90	34.10	200.50	3
235	Mutant-2	67	167	145.30	11	10.69	37.00	86.00	7.80	30.40	91.20	3
Means for check varieties												
	PRT-7	66.69	165.31	61.35	4.31	4.31	22.15	35.31	4.78	23.97	54.13	3.08
	PRT-12	64.08	169.75	58.81	4.25	4.25	20.33	37.25	4.77	24.93	44.56	3.00
	Vikrant	66.17	168.08	63.43	4.67	4.67	18.50	31.75	4.81	26.93	65.16	3.00
	Minimum	**57.00**	**138.00**	**26.60**	**2.00**	**1.69**	**7.00**	**12.00**	**3.90**	**21.00**	**8.10**	**3.00**
	Maximum	**98.00**	**191.00**	**145.30**	**15.00**	**14.69**	**91.00**	**139.00**	**7.80**	**92.00**	**300.00**	**4.00**
	Mean	**73.65**	**174.14**	**61.92**	**4.35**	**4.33**	**21.06**	**35.25**	**4.87**	**28.22**	**87.24**	**3.00**
	CD (0.05)	**27.80**	**11.06**	**27.47**	**2.05**	**-**	**17.71**	**22.14**	**1.02**	**5.80**	**105.49**	**0.41**
	CV (%) Error	**16.99**	**2.65**	**17.94**	**18.90**	**-**	**35.59**	**25.67**	**8.52**	**9.21**	**81.63**	**5.50**
	CV (%) Phenotypic	**11.52**	**3.98**	**21.59**	**32.59**	**36.37**	**40.59**	**36.56**	**10.42**	**19.40**	**73.34**	**2.16**

Table 125. Multilocational evaluation of germplasm lines in faba bean at Delhi - 2006 (Plains)

Sr. No.	Block No.	Accession No.	Qualitative characters				Quantitative characters								
			Leaflets/leaf	No. of flowers/cluster	Leaf shape	Disear score	Days to flower	Days to 50% flowering	Days to maturity		Plant height (cm)	No. of Branches	Pods/Plant	No.of grains/pod.	No. of pods/cluster
									Obs.	Adj.					
1	1	EC329672	5	4	2	1	67	89	163	159.40	67.00	4.20	21.40	2.80	1.20
2	1	EC343749	5	4	2	1	72	94	163	159.40	67.60	4.40	27.40	2.60	1.00
3	1	EC243860	6	4	2	1	70	89	166	162.40	78.80	4.80	34.60	2.60	1.40
4	1	EC329662	5	4	1	2	70	92	158	154.40	68.00	6.40	26.80	2.60	1.00
5	1	EC243594	5	4	2	1	66	89	162	158.40	73.80	2.00	13.60	2.60	1.00
6	1	EC329687	5	5	2	2	72	92	164	160.40	69.80	5.60	31.80	3.20	1.60
7	1	EC10845	5	3	2	1	72	94	164	160.40	55.40	3.40	11.60	2.20	1.00
8	1	EC117361	5	4	2	3	69	89	164	160.40	62.40	4.60	25.40	2.60	1.20
9	1	EC243761	6	4	2	1	69	92	164	160.40	71.80	6.20	27.60	2.60	1.40
10	1	EC329677	5	4	2	1	76	94	161	157.40	69.60	7.00	35.80	2.80	1.00
11	1	EC263624	5	4	2	1	74	92	164	160.40	72.00	4.60	24.40	2.20	1.20
12	1	EC329681	5	3	2	0	73	94	164	160.40	70.40	5.40	18.40	3.40	1.00
13	2	EC243631	5	4	3	1	72	97	165	163.73	80.80	4.40	21.80	2.60	1.40
14	2	EC329715	5	4	2	2	71	94	161	159.73	69.40	5.40	27.40	2.40	1.20
15	2	EC243756	5	4	2	2	63	89	161	159.73	67.00	4.40	24.20	2.60	1.20
16	2	EC243895	5	4	2	2	68	91	160	158.73	72.80	4.60	21.40	1.40	1.20
17	2	EC329712	5	3	2	2	59	82	155	153.73	55.40	4.60	31.80	3.20	1.60
18	2	EC329691	5	3	2	2	57	71	161	159.73	68.20	4.20	21.80	2.80	1.00
19	2	EC243772	5	4	2	3	84	97	168	166.73	65.60	4.00	17.60	2.80	1.20
20	2	IC361496	5	4	2	3	53	67	160	158.73	74.20	6.60	24.80	2.60	1.00
21	2	EC117724	5	4	2	1	52	76	155	153.73	87.20	7.40	44.40	3.00	1.60
22	2	EC117842	5	5	2	1	69	91	161	159.73	65.60	5.80	32.60	2.60	1.60
23	2	IC332102	5	4	2	1	76	97	155	153.73	68.10	7.00	37.20	3.20	2.00
24	2	IC361499	5	2	1	1	64	92	150	148.73	62.50	7.20	41.80	3.60	1.40
25	3	IC329680	5	3	2	3	65	89	164	162.73	58.00	4.20	16.20	2.40	1.20
26	3	EC5864	5	4	2	5	69	92	164	162.73	58.40	4.40	30.40	3.00	1.20
27	3	EC329812	5	3	2	1	70	94	158	156.73	69.60	5.60	19.60	3.00	1.20
28	3	EC329667	5	4	2	1	72	97	164	162.73	78.00	7.60	46.60	3.00	1.20

Table 125. Multilocationa

Sr. No.	Block No.	Accession No.	Quantitative characters								
			Pod length (cm)	Leaf length (cm)		Leaf width (cm)		100 seed wt. (g)		Yield/plant (g)	Yiled (q/ha)
				Obs.	Adj.	Obs.	Adj.	Obs.	Adj.		
1	1	EC329672	3.86	6.50	6.02	3.10	3.03	28.00	28.73	10.00	9.26
2	1	EC343749	3.90	6.70	6.22	2.70	2.63	28.00	28.73	5.00	1.85
3	1	EC243860	4.60	6.60	6.12	3.40	3.33	30.00	30.73	20.00	9.26
4	1	EC329662	3.30	7.42	6.94	3.20	3.13	24.50	25.23	20.00	7.41
5	1	EC243594	5.00	6.30	5.82	2.96	2.89	28.50	29.23	8.00	11.11
6	1	EC329687	4.42	7.08	6.60	3.48	3.41	28.00	28.73	22.00	11.11
7	1	EC10845	3.98	6.36	5.88	2.78	2.71	27.00	27.73	15.00	11.11
8	1	EC117361	4.46	7.00	6.52	3.16	3.09	22.00	22.73	10.00	7.41
9	1	EC243761	4.22	6.24	5.76	3.04	2.97	23.00	23.73	20.00	7.41
10	1	EC329677	4.02	6.74	6.26	2.74	2.67	22.00	22.73	20.00	3.70
11	1	EC263624	4.18	7.24	6.76	2.98	2.91	28.00	28.73	10.00	11.11
12	1	EC329681	4.84	6.94	6.46	3.00	2.93	30.50	31.23	10.00	11.11
13	2	EC243631	4.24	6.24	6.66	3.12	3.11	26.00	25.73	20.00	11.11
14	2	EC329715	3.96	5.74	6.16	2.66	2.65	23.00	22.73	10.00	11.11
15	2	EC243756	4.14	6.48	6.90	3.20	3.19	23.50	23.23	100.00	16.67
16	2	EC243895	3.94	6.67	7.09	3.02	3.01	23.50	23.23	16.00	5.56
17	2	EC329712	3.62	6.00	6.42	2.64	2.63	21.00	20.73	17.00	7.41
18	2	EC329691	4.08	6.10	6.52	3.08	3.07	26.50	26.23	10.00	3.70
19	2	EC243772	3.98	6.30	6.72	2.98	2.97	27.00	26.73	10.00	3.70
20	2	IC361496	4.18	6.20	6.62	2.72	2.71	27.00	26.73	16.00	5.56
21	2	EC117724	3.94	5.48	5.90	2.58	2.57	25.00	24.73	15.00	14.81
22	2	EC117842	4.10	5.64	6.06	2.52	2.51	27.00	26.73	20.00	14.81
23	2	IC332102	3.78	5.62	6.04	2.46	2.45	22.50	22.23	20.00	11.11
24	2	IC361499	4.28	5.96	6.38	2.44	2.43	20.00	19.73	20.00	11.11
25	3	IC329680	4.28	6.12	5.62	2.64	2.44	27.00	24.23	12.00	4.63
26	3	EC5864	4.52	6.90	6.40	3.10	2.90	24.00	21.23	20.00	7.78
27	3	EC329812	3.66	7.70	7.20	3.08	2.88	29.50	26.73	7.00	11.11
28	3	EC329667	4.60	7.06	6.56	3.16	2.96	25.50	22.73	40.00	15.93

Sr. No.	Block No.	Accession No.	Qualitative characters				Quantitative characters								
			Leaflets/leaf	No. of flowers/cluster	Leaf shape	Disear score	Days to flower	Days to 50% flowering	Days to maturity		Plant height (cm)	No. of Branches	Pods/Plant	No.of grains/pod.	No. of pods/cluster
									Obs.	Adj.					
29	3	EC117795	5	4	2	1	68	94	158	156.73	74.80	7.80	39.00	3.20	1.40
30	3	EC329628	6	4	2	1	74	97	158	156.73	76.20	5.20	47.40	3.40	1.40
31	3	EC117758	5	4	2	0	70	94	164	162.73	71.80	6.00	36.00	2.80	1.20
32	3	EC117818	5	4	2	0	66	91	164	162.73	73.60	8.20	36.40	3.00	1.00
33	3	EC324677	5	3	2	0	70	94	158	156.73	72.00	8.40	48.40	2.60	1.40
34	3	EC117755	5	4	2	0	76	97	164	162.73	71.80	6.20	32.60	2.60	1.00
35	3	EC329643	5	3	1	1	69	94	155	153.73	70.80	5.20	35.80	2.60	1.20
36	3	EC117744	5	4	2	1	70	92	158	156.73	87.40	6.60	28.20	3.40	1.60
37	4	EC25072	5	4	2	1	63	91	163	161.73	76.40	5.20	33.20	2.60	1.00
38	4	EC243637	5	4	2	2	64	89	160	158.73	79.60	6.30	41.60	2.80	1.00
39	4	EC117748	6	4	2	0	76	97	165	163.73	89.90	5.20	36.00	2.40	1.40
40	4	EC10720	5	4	2	1	66	91	162	160.73	87.20	5.20	35.40	2.80	1.00
41	4	EC267649	5	4	2	2	63	89	160	158.73	91.20	4.20	18.40	2.00	1.00
42	4	EC243786	6	4	2	1	71	94	166	164.73	81.20	4.60	23.00	2.40	1.00
43	4	EC248951	5	4	2	1	68	89	161	159.73	67.80	6.00	35.00	2.60	1.40
44	4	EC329711	5	5	2	0	76	97	164	162.73	81.20	5.80	32.60	3.00	1.00
45	4	EC25192	5	5	2	1	66	94	158	156.73	81.20	6.20	35.60	2.40	1.40
46	4	EC243036	5	3	2	1	70	94	160	158.73	71.60	6.60	31.60	2.80	1.20
47	4	EC117753	5	4	2	1	76	94	163	161.73	86.80	8.00	37.20	2.80	1.00
48	4	EC32790	5	4	2	1	61	90	160	158.73	82.40	8.80	44.40	2.60	1.00
49	5	EC329679	5	5	2	1	63	84	163	162.73	89.20	6.60	42.00	3.00	1.80
50	5	EC117726	6	4	2	0	76	94	158	157.73	81.20	6.80	47.20	3.00	1.20
51	5	EC331561	5	4	2	0	67	91	163	162.73	86.40	6.40	37.80	3.20	1.00
52	5	EC354984	5	4	2	0	71	94	166	165.73	70.40	5.60	23.80	2.80	1.00
53	5	EC329725	5	4	2	0	69	94	159	158.73	83.40	8.40	64.80	2.60	1.60
54	5	EC243770	5	3	2	0	68	97	159	158.73	95.00	9.00	39.60	2.80	1.40
55	5	EC108908	5	3	2	0	76	99	159	158.73	89.80	5.80	25.00	3.20	1.00
56	5	EC117792	5	3	2	0	68	95	158	157.73	86.60	7.40	35.80	3.40	1.00
57	5	EC117705	5	4	2	0	78	89	162	161.73	83.00	5.20	33.00	2.80	1.20
58	5	IC348948	5	4	2	0	70	89	161	160.73	74.60	5.20	25.40	2.60	1.00
59	5	EC343793	5	3	2	0	57	84	159	158.73	69.80	5.40	32.20	2.60	1.00

Sr. No.	Block No.	Accession No.	Quantitative characters								
			Pod length (cm)	Leaf length (cm)		Leaf width (cm)		100 seed wt. (g)		Yield/plant (g)	Yiled (q/ha)
				Obs.	Adj.	Obs.	Adj.	Obs.	Adj.		
29	3	EC117795	4.24	6.36	5.86	2.96	2.76	24.50	21.73	20.00	12.96
30	3	EC329628	4.68	6.68	6.18	3.12	2.92	25.00	22.23	21.00	11.11
31	3	EC117758	4.82	6.00	5.50	3.14	2.94	27.00	24.23	23.00	12.04
32	3	EC117818	4.84	7.56	7.06	2.80	2.60	33.00	30.23	22.00	9.26
33	3	EC324677	3.48	6.64	6.14	2.92	2.72	29.50	26.73	22.00	18.52
34	3	EC117755	4.84	6.19	5.69	2.62	2.42	28.00	25.23	23.00	14.81
35	3	EC329643	3.60	6.50	6.00	3.22	3.02	24.00	21.23	27.00	22.22
36	3	EC117744	5.32	7.04	6.54	2.96	2.76	32.00	29.23	25.00	18.52
37	4	EC25072	3.70	6.54	6.15	2.88	2.64	21.00	19.90	16.00	8.33
38	4	EC243637	3.82	5.86	5.47	2.90	2.66	25.00	23.90	18.00	8.52
39	4	EC117748	3.90	6.82	6.43	2.88	2.64	29.00	27.90	22.00	16.67
40	4	EC10720	3.70	6.58	6.19	2.88	2.64	25.00	23.90	15.00	7.41
41	4	EC267649	3.98	6.90	6.51	3.18	2.94	27.00	25.90	26.00	14.81
42	4	EC243786	5.00	5.78	5.39	2.86	2.62	28.00	26.90	25.00	11.11
43	4	EC248951	3.92	6.12	5.73	2.82	2.58	24.00	22.90	28.00	15.37
44	4	EC329711	4.84	6.00	5.61	2.72	2.48	24.50	23.40	18.00	7.41
45	4	EC25192	4.46	5.90	5.51	3.60	3.36	28.00	26.90	28.00	22.22
46	4	EC243036	4.42	6.00	5.61	2.60	2.36	27.00	25.90	20.00	18.52
47	4	EC117753	4.28	6.32	5.93	3.10	2.86	21.50	20.40	25.00	14.81
48	4	EC32790	4.30	6.52	6.13	2.90	2.66	33.00	31.90	15.00	6.48
49	5	EC329679	4.54	7.14	6.90	3.22	3.06	35.00	31.23	24.00	22.59
50	5	EC117726	4.82	5.86	5.62	2.70	2.54	28.00	24.23	21.00	18.52
51	5	EC331561	4.84	6.18	5.94	3.08	2.92	31.00	27.23	36.00	8.15
52	5	EC354984	4.80	6.88	6.64	3.02	2.86	30.00	26.23	21.00	18.89
53	5	EC329725	3.80	5.60	5.36	2.66	2.50	30.00	26.23	38.00	33.33
54	5	EC243770	4.18	6.44	6.20	3.28	3.12	29.00	25.23	40.00	33.89
55	5	EC108908	4.22	6.24	6.00	2.98	2.82	30.00	26.23	20.00	22.22
56	5	EC117792	5.02	5.76	5.52	2.90	2.74	32.50	28.73	35.00	33.89
57	5	EC117705	4.50	6.50	6.26	2.84	2.68	30.00	26.23	28.00	26.11
58	5	IC348948	4.46	6.02	5.78	3.24	3.08	27.00	23.23	26.00	25.93
59	5	EC343793	3.52	6.32	6.08	3.04	2.88	28.00	24.23	17.00	15.56

Sr. No.	Block No.	Accession No.	Qualitative characters				Quantitative characters								
			Leaflets/leaf	No. of flowers/cluster	Leaf shape	Disear score	Days to flower	Days to 50% flowering	Days to maturity		Plant height (cm)	No. of Branches	Pods/Plant	No.of grains/pod.	No. of pods/cluster
									Obs.	Adj.					
60	5	EC267641	5	4	2	0	78	99	165	164.73	77.20	5.60	25.00	2.80	2.80
61	6	EC329724	5	4	2	1	78	101	165	163.07	85.33	5.50	43.17	2.83	1.16
62	6	EC343808	5	5	2	0	68	94	160	158.07	88.60	7.40	47.60	2.60	1.00
63	6	EC329812	5	5	2	0	57	89	161	159.07	77.40	5.00	29.00	3.00	1.40
64	6	EC243860	5	4	2	0	78	101	160	158.07	83.80	6.40	35.20	3.00	1.00
65	6	IC361470	5	4	2	0	67	94	160	158.07	92.40	5.20	48.80	2.80	1.00
66	6	EC329696	5	4	2	1	59	89	160	158.07	82.40	5.40	38.80	2.40	1.00
67	6	EC243608	6	4	2	1	66	97	160	158.07	86.60	7.20	43.40	2.60	1.00
68	6	EC267648	6	4	2	1	65	94	155	153.07	62.20	6.40	41.40	3.40	2.00
69	6	EC243584	5	4	2	0	63	89	158	156.07	80.80	5.60	33.40	2.80	1.40
70	6	EC329682	5	4	2	0	70	97	158	156.07	72.80	6.60	35.00	2.80	1.60
71	6	EC361494	5	5	2	0	71	98	163	161.07	85.00	6.60	40.60	2.80	1.40
72	6	EC329588	5	4	2	0	67	89	160	158.07	83.80	8.40	36.00	2.80	1.00
73	7	EC343855	5	3	2	0	71	96	161	160.07	67.20	6.20	23.40	2.60	1.00
74	7	IC332138	5	3	2	0	78	98	161	160.07	63.40	7.80	31.80	2.80	1.20
75	7	EC354985	5	3	2	0	76	97	161	160.07	64.40	5.60	27.60	2.60	1.00
76	7	EC247592	5	4	2	0	71	101	166	165.07	59.20	4.60	24.00	3.00	1.00
77	7	EC243525A	5	3	1	0	78	97	159	158.07	68.00	5.40	24.80	2.40	1.40
78	7	EC329668	6	2	1	0	67	91	164	163.07	67.00	5.80	35.00	3.00	1.40
79	7	EC34710	5	4	2	0	78	97	155	154.07	72.90	6.00	48.40	3.20	1.00
80	7	IC276939	5	4	2	0	76	94	158	157.07	73.60	6.40	33.60	2.60	1.00
81	7	EC117741	5	4	2	0	71	97	158	157.07	71.00	4.80	17.20	3.20	1.00
82	7	EC243808	5	3	2	0	70	95	158	157.07	68.00	5.80	28.20	3.20	1.20
83	7	EC323731	5	6	2	0	78	102	162	161.07	70.20	4.20	22.00	3.00	1.00
84	7	EC117809	5	4	2	0	67	102	164	163.07	75.60	6.60	21.00	2.40	1.00
85	8	EC10719	5	4	2	2	66	90	161	162.73	80.60	6.00	28.00	2.60	1.60
86	8	EC329638	5	4	2	2	67	91	162	163.73	77.75	6.75	21.00	3.00	1.00
87	8	IC346272	5	4	1	2	71	94	155	156.73	63.30	5.80	32.00	2.80	2.20
88	8	EC329713	5	4	2	2	78	97	164	165.73	69.00	6.80	33.20	3.00	1.40
89	8	EC299713	5	5	2	1	70	98	164	165.73	82.40	5.80	22.40	2.80	1.40
90	8	EC329707	5	5	2	2	72	95	164	165.73	77.20	4.00	21.00	2.80	1.20

Sr. No.	Block No.	Accession No.	Quantitative characters								
			Pod length (cm)	Leaf length (cm)		Leaf width (cm)		100 seed wt. (g)		Yield/plant (g)	Yiled (q/ha)
				Obs.	Adj.	Obs.	Adj.	Obs.	Adj.		
60	5	EC267641	4.24	6.84	6.60	3.48	3.32	31.00	27.23	22.00	18.15
61	6	EC329724	4.45	6.96	6.93	3.20	2.99	25.50	20.73	30.00	22.78
62	6	EC343808	4.48	6.96	6.93	3.32	3.11	36.50	31.73	35.00	21.48
63	6	EC329812	5.04	7.10	7.07	3.10	2.89	31.00	26.23	22.00	19.26
64	6	EC243860	4.66	6.34	6.31	2.96	2.75	29.00	24.23	18.00	14.81
65	6	IC361470	4.58	6.88	6.85	2.86	2.65	23.00	18.23	21.00	19.81
66	6	EC329696	3.46	5.88	5.85	3.32	3.11	27.00	22.23	25.00	18.89
67	6	EC243608	4.48	6.12	6.09	2.82	2.61	26.00	21.23	20.00	16.67
68	6	EC267648	4.12	5.90	5.87	2.62	2.41	23.00	18.23	25.00	20.00
69	6	EC243584	4.60	7.02	6.99	3.40	3.19	30.00	25.23	18.00	15.00
70	6	EC329682	4.54	6.36	6.33	2.84	2.63	31.00	26.23	28.00	22.78
71	6	EC361494	4.44	6.80	6.77	3.30	3.09	34.00	29.23	22.00	17.78
72	6	EC329588	4.42	6.00	5.97	2.58	2.37	28.00	23.23	20.00	16.67
73	7	EC343855	4.20	5.94	5.74	3.06	2.94	23.50	22.57	22.00	15.74
74	7	IC332138	3.98	6.34	6.14	3.26	3.14	29.00	28.07	10.00	5.56
75	7	EC354985	4.38	6.26	6.06	2.90	2.78	32.50	31.57	21.00	14.07
76	7	EC247592	4.16	6.24	6.04	3.10	2.98	30.00	29.07	20.00	13.89
77	7	EC243525A	3.26	6.16	5.96	2.72	2.60	23.00	22.07	15.00	9.26
78	7	EC329668	4.18	6.00	5.80	2.62	2.50	22.50	21.57	15.00	7.41
79	7	EC34710	3.56	6.78	6.58	3.00	2.88	24.00	23.07	20.00	11.11
80	7	IC276939	4.54	6.22	6.02	2.96	2.84	29.00	28.07	24.00	12.96
81	7	EC117741	4.50	5.84	5.64	2.70	2.58	28.50	27.57	20.00	10.37
82	7	EC243808	4.12	6.10	5.90	2.80	2.68	27.00	26.07	8.00	5.56
83	7	EC323731	5.46	6.26	6.06	3.22	3.10	34.50	33.57	18.00	9.26
84	7	EC117809	3.94	5.16	4.96	3.08	2.96	27.00	26.07	8.00	4.63
85	8	EC10719	4.80	6.32	6.98	2.96	3.42	29.00	31.07	14.00	4.44
86	8	EC329638	4.60	6.44	7.10	2.86	3.32	25.00	27.07	8.00	3.70
87	8	IC346272	3.82	6.88	7.54	3.08	3.54	19.50	21.57	15.00	10.00
88	8	EC329713	4.42	5.88	6.54	2.76	3.22	23.00	25.07	10.00	6.48
89	8	EC299713	4.26	6.44	7.10	2.66	3.12	25.00	27.07	16.00	9.26
90	8	EC329707	4.44	6.70	7.36	2.90	3.36	23.50	25.57	8.00	5.56

Sr. No.	Block No.	Accession No.	Qualitative characters				Quantitative characters								
			Leaflets/leaf	No. of flowers/cluster	Leaf shape	Disear score	Days to flower	Days to 50% flowering	Days to maturity		Plant height (cm)	No. of Branches	Pods/Plant	No.of grains/pod.	No. of pods/cluster
									Obs.	Adj.					
91	8	EC359685	5	4	2	2	61	86	163	164.73	74.60	6.20	31.40	3.00	1.20
92	8	EC117765	5	3	2	2	71	97	164	165.73	63.20	4.40	22.20	2.80	1.20
93	8	JBT42/RP-3/76	5	3	2	0	74	94	167	168.73	72.40	4.40	21.40	2.80	1.20
94	8	JBT42/RP-3/28	5	2	1	1	63	87	152	153.73	59.10	5.20	28.60	3.60	2.00
95	8	JBT41/80	5	3	2	0	57	84	152	153.73	55.90	5.40	33.00	3.40	2.00
96	8	JBT42/RP-3/36	5	3	1	1	66	91	156	157.73	64.30	4.60	25.40	3.40	1.60
97	9	EC550179	5	3	1	0	53	76	152	157.07	62.00	7.00	43.80	3.40	1.40
98	9	JBT42/RP-8/69	5	7	3	0	79	98	162	167.07	50.50	8.33	-	-	-
99	9	JBT41/84	5	3	2	0	59	82	152	157.07	69.50	6.20	37.40	3.20	1.20
100	9	JBT42/RP-3/31	5	3	1	0	66	92	152	157.07	70.50	11.40	81.40	3.20	2.00
101	9	VKS-18/46	5	4	2	1	67	92	166	171.07	91.75	6.50	17.50	2.50	1.00
102	9	ISV-10-2	5	3	1	1	63	88	154	159.07	63.20	5.40	53.25	3.00	1.80
103	9	EC354951	5	4	2	1	78	96	166	171.07	69.20	5.20	24.00	2.60	1.20
104	9	MKS/AK-272	5	4	2	0	69	93	163	168.07	65.80	7.00	23.60	2.60	1.20
105	9	JBT30/78	5	5	3	1	81	98	164	169.07	85.75	17.00	20.50	4.00	1.00
106	9	JSSR-110	5	3	2	1	74	96	164	169.07	66.00	7.40	2.38	2.80	1.00
107	9	EC399712	5	4	1	0	70	93	154	159.07	62.70	4.20	16.20	3.00	1.20
108	9	VKS/SCC-7/15	5	4	2	1	73	92	168	173.07	76.40	4.20	18.60	2.80	1.00
109	9	EC243525A	5	4	2	0	65	89	168	173.07	82.20	6.00	25.60	2.80	1.00
110	9	VKG27/128	5	4	2	0	67	90	168	173.07	74.40	5.40	29.40	2.60	1.00
111	9	VKS17/30	5	4	1	0	67	90	154	159.07	75.80	4.20	44.40	3.00	1.60
112	9	MKS/AKT-213	5	3	1	0	69	93	154	159.07	63.00	5.00	33.00	3.20	1.80
113	9	VKS18/46	5	5	2	0	89	99	154	159.07	50.90	11.40	17.00	3.00	1.00
114	9	EC243529	5	2	1	0	77	95	154	159.07	61.90	7.40	38.60	2.80	1.40
115	9	VKS/SCC7/2	5	4	2	0	76	98	162	167.07	71.10	6.60	38.20	3.20	1.20
116	9	BL/MKS-7	6	4	1	0	61	82	154	159.07	69.00	3.40	28.60	3.20	1.20
117	9	VKS17/26	5	4	2	0	65	87	168	173.07	73.20	5.80	21.00	2.60	1.00
118	9	VKS17/110	5	2	2	0	69	90	154	159.07	58.50	3.80	28.60	3.20	1.80
119	9	VKG28/2	5	3	1	0	70	89	154	159.07	49.00	6.20	33.20	3.00	1.20
120	10	EC243709	5	4	1	0	70	90	154	157.73	62.70	5.60	37.00	2.80	1.60
121	10	JBT38/144	5	5	2	0	71	96	168	171.73	79.40	5.00	19.40	2.60	1.00

Sr. No.	Block No.	Accession No.	Quantitative characters								
			Pod length (cm)	Leaf length (cm)		Leaf width (cm)		100 seed wt. (g)		Yield/plant (g)	Yiled (q/ha)
				Obs.	Adj.	Obs.	Adj.	Obs.	Adj.		
91	8	EC359685	4.18	5.92	6.58	2.78	3.24	25.50	27.57	12.00	6.67
92	8	EC117765	4.10	6.16	6.82	2.82	3.28	19.00	21.07	8.00	5.56
93	8	JBT42/RP-3/76	4.24	6.78	7.44	3.12	3.58	24.00	26.07	8.00	7.41
94	8	JBT42/RP-3/28	3.46	7.26	7.92	2.92	3.38	20.00	22.07	20.00	12.96
95	8	JBT41/80	3.70	6.30	6.96	2.84	3.30	16.00	18.07	15.00	9.26
96	8	JBT42/RP-3/36	3.94	5.94	6.60	2.24	2.70	17.50	19.57	12.00	5.56
97	9	EC550179	3.46	6.34	6.32	2.50	2.56	18.00	23.90	21.00	14.81
98	9	JBT42/RP-8/69	-	5.80	5.78	3.00	3.06	-	-	-	-
99	9	JBT41/84	4.10	6.08	6.06	2.82	2.88	23.00	28.90	20.00	15.93
100	9	JBT42/RP-3/31	3.44	6.24	6.22	2.46	2.52	21.00	26.90	20.00	19.63
101	9	VKS-18/46	3.72	5.66	5.64	2.56	2.62	24.00	29.90	15.00	12.59
102	9	ISV-10-2	3.78	6.10	6.08	2.84	2.90	20.00	25.90	15.00	9.26
103	9	EC354951	3.70	6.18	6.16	2.70	2.76	20.00	25.90	5.00	4.44
104	9	MKS/AK-272	4.20	6.02	6.00	2.56	2.62	30.00	35.90	12.00	6.48
105	9	JBT30/78	6.65	7.04	7.02	3.38	3.44	34.00	39.90	10.00	7.04
106	9	JSSR-110	3.28	5.76	5.74	2.70	2.76	14.00	19.90	10.00	5.56
107	9	EC399712	4.10	5.82	5.80	2.58	2.64	14.00	19.90	5.00	3.70
108	9	VKS/SCC-7/15	3.24	6.40	6.38	2.88	2.94	23.00	28.90	12.00	6.30
109	9	EC243525A	4.16	6.88	6.86	3.30	3.36	25.00	30.90	22.00	13.70
110	9	VKG27/128	4.26	6.26	6.24	2.78	2.84	29.50	35.40	20.00	10.74
111	9	VKS17/30	4.06	6.04	6.02	2.64	2.70	25.00	30.90	20.00	9.63
112	9	MKS/AKT-213	3.52	6.28	6.26	2.78	2.84	19.00	24.90	10.00	9.26
113	9	VKS18/46	7.20	7.16	7.14	2.66	2.72	26.00	31.90	18.00	12.96
114	9	EC243529	3.28	5.42	5.40	2.28	2.34	15.00	20.90	10.00	9.26
115	9	VKS/SCC7/2	4.44	6.50	6.48	2.84	2.90	22.00	27.90	16.00	7.78
116	9	BL/MKS-7	3.94	6.70	6.68	2.70	2.76	24.50	30.40	22.00	19.26
117	9	VKS17/26	4.28	6.00	5.98	2.52	2.58	26.00	31.90	25.00	15.93
118	9	VKS17/110	3.46	5.42	5.40	2.32	2.38	17.00	22.90	18.00	13.70
119	9	VKG28/2	3.26	5.66	5.64	2.34	2.40	18.00	23.90	7.00	5.93
120	10	EC243709	3.54	5.78	6.57	2.24	2.72	22.00	26.90	16.00	10.19
121	10	JBT38/144	4.74	6.86	7.65	3.14	3.62	26.00	30.90	8.00	4.44

Sr. No.	Block No.	Accession No.	Qualitative characters				Quantitative characters								
			Leaflets/leaf	No. of flowers/cluster	Leaf shape	Disear score	Days to flower	Days to 50% flowering	Days to maturity		Plant height (cm)	No. of Branches	Pods/Plant	No.of grains/pod.	No. of pods/cluster
									Obs.	Adj.					
122	10	EC354984	6	3	1	0	70	92	154	157.73	68.80	3.00	27.20	3.20	1.00
123	10	VKG27/54	5	5	2	0	74	93	168	171.73	78.80	5.60	13.00	2.20	1.00
124	10	VKG-2	5	3	1	0	66	89	152	155.73	72.96	5.60	32.00	3.00	1.20
125	10	VKG29/36	5	3	1	0	66	85	152	155.73	61.90	8.00	38.00	2.80	1.60
126	10	VKG29/53	5	4	1	0	66	84	152	155.73	72.56	7.80	59.20	3.00	2.00
127	10	VKG29/58	5	3	1	0	66	86	152	155.73	72.20	5.80	35.60	3.20	1.40
128	10	VKG29/64	5	2	2	0	57	84	150	153.73	77.70	8.80	43.40	2.80	1.69
129	10	VKG29/76	5	2	2	1	66	91	153	156.73	68.10	7.80	50.80	3.60	1.80
130	10	VKG29/82	5	2	2	0	66	92	154	157.73	75.20	6.00	32.00	3.80	1.60
131	10	VKG29/87	5	4	3	1	74	96	158	161.73	82.80	9.20	21.40	3.40	1.00
132	10	VKG29/91	5	3	2	1	70	90	153	156.73	69.90	10.40	21.80	3.20	1.40
133	10	VKG29/108	5	3	2	0	60	91	153	156.73	74.40	7.00	17.60	3.60	1.20
134	10	VKG29/109	5	3	2	0	70	91	153	156.73	69.00	6.00	11.80	3.00	1.20
135	10	VKG29/113	5	2	1	0	66	93	153	156.73	68.20	6.40	6.20	3.00	1.20
136	10	SPO-20-03	5	4	1	0	64	89	153	156.73	65.80	5.80	13.20	2.60	1.20
137	10	SPO-21-03	5	4	3	0	72	88	153	156.73	65.40	7.80	16.20	3.00	1.00
138	10	SPO-22-03	5	5	2	0	73	89	153	156.73	62.80	6.20	3.60	3.00	1.00
139	10	BGR-82	5	4	2	0	71	91	155	158.73	52.60	10.80	3.80	3.75	1.00
140	10	BGR-89	4	4	3	0	107	113	170	173.73	64.60	9.40	-	-	-
141	10	KP/DS-46	4	3	3	0	115	120	172	175.73	76.80	5.60	-	-	-
142	10	VKG29/70	5	5	1	0	57	82	153	156.73	49.40	2.00	3.00	2.40	1.00
Mean of check varieties															
PRT-7			5	4	2	0	**72.50**	**94.00**	**159.90**	**159.90**	**72.86**	**5.17**	**22.49**	**2.64**	**1.18**
PRT-12			5	4	1	0	**62.20**	**89.10**	**158.10**	**158.10**	**78.76**	**5.72**	**31.28**	**2.96**	**1.18**
Vikrant			5	4	1	0	**67.20**	**91.90**	**158.20**	**158.20**	**70.05**	**5.43**	**37.05**	**2.99**	**1.37**
Minimum			4	2	1	0	52.00	67.00	150.00	148.73	49.00	2.00	2.38	1.40	1.00
Maximum			6	7	3	5	115.00	120.00	172.00	175.73	95.00	17.00	81.40	4.00	2.80
Mean							69.59	92.26	159.78	160.45	72.46	6.11	30.28	2.87	1.27
CD (0.05)							11.72	8.90	6.24	6.24	23.51	4.21	21.85	0.85	0.59
CV (%) Error							6.85	3.82	1.54	1.54	12.51	30.47	28.38	11.64	18.78
CV (%) Phenotypic							11.35	6.63	3.06	3.04	13.23	30.04	39.24	12.73	24.85

Sr. No.	Block No.	Accession No.	Quantitative characters								
			Pod length (cm)	Leaf length (cm)		Leaf width (cm)		100 seed wt. (g)		Yield/plant (g)	Yiled (q/ha)
				Obs.	Adj.	Obs.	Adj.	Obs.	Adj.		
122	10	EC354984	4.12	5.38	6.17	2.30	2.78	17.00	21.90	10.00	9.26
123	10	VKG27/54	3.36	5.92	6.71	2.68	3.16	23.00	27.90	8.00	4.07
124	10	VKG-2	4.74	5.46	6.25	2.56	3.04	20.00	24.90	12.00	9.26
125	10	VKG29/36	3.38	5.38	6.17	2.30	2.78	16.00	20.90	12.00	6.30
126	10	VKG29/53	3.68	5.32	6.11	2.26	2.74	21.00	25.90	22.00	9.63
127	10	VKG29/58	3.86	5.44	6.23	2.26	2.74	19.00	23.90	21.00	11.11
128	10	VKG29/64	3.82	6.02	6.81	2.30	2.78	17.00	21.90	20.00	9.26
129	10	VKG29/76	3.94	6.70	7.49	2.66	3.14	18.00	22.90	25.00	16.30
130	10	VKG29/82	3.60	7.22	8.01	2.78	3.26	15.00	19.90	14.00	12.96
131	10	VKG29/87	4.14	6.38	7.17	2.88	3.36	24.00	28.90	10.00	7.78
132	10	VKG29/91	3.96	6.46	7.25	2.68	3.16	14.50	19.40	5.00	3.70
133	10	VKG29/108	3.30	6.62	7.41	2.48	2.96	13.50	18.40	5.00	3.70
134	10	VKG29/109	3.78	7.04	7.83	2.94	3.42	17.00	21.90	5.00	2.96
135	10	VKG29/113	3.60	6.66	7.45	2.44	2.92	5.00	9.90	2.00	0.74
136	10	SPO-20-03	2.52	6.48	7.27	2.46	2.94	9.00	13.90	5.00	1.85
137	10	SPO-21-03	2.88	7.00	7.79	3.16	3.64	10.50	15.40	2.00	0.74
138	10	SPO-22-03	2.96	6.38	7.17	2.92	3.40	5.00	9.90	3.00	1.11
139	10	BGR-82	2.50	6.02	6.81	2.86	3.34	2.00	6.90	1.00	0.37
140	10	BGR-89	-	6.36	7.15	3.16	3.64	-	-	-	-
141	10	KP/DS-46	-	5.62	6.41	3.10	3.58	-	-	-	-
142	10	VKG29/70	4.10	4.62	5.41	2.28	2.76	-	-	-	-
Mean of check varieties											
PRT-7			**3.95**	**6.46**	**6.46**	**2.93**	**2.93**	**23.60**	**23.60**	**12.20**	**7.93**
PRT-12			**4.12**	**6.10**	**6.10**	**2.78**	**2.78**	**25.15**	**25.15**	**22.80**	**15.65**
Vikrant			**3.93**	**6.38**	**6.38**	**2.89**	**2.89**	**21.95**	**21.95**	**15.30**	**12.07**
Minimum			2.50	4.62	4.96	2.24	2.34	2.00	6.90	1.00	0.37
Maximum			7.20	7.70	8.01	3.60	3.64	36.50	39.90	100.00	33.89
Mean			4.13	6.32	6.38	2.86	2.90	24.32	25.02	17.80	11.59
CD (0.05)			1.42	1.27	1.27	0.66	0.66	9.45	9.45	18.28	13.45
CV (%) Error			13.99	7.92	7.92	9.10	9.10	15.77	15.77	42.87	44.52
CV (%) Phenotypic			14.97	8.27	9.49	10.26	10.63	24.48	18.84	58.74	56.72

Table 126. Multilocational evaluation of germplasm lines in faba bean at Faizabad - 2006 (Plains)

S.No.	Accession No.	Days to flowering	Days to maturity	Plant height (cm)	No. of Branches/ plant		No. of Pods/plant		Pod length (cm)	No. of grain/pod	100 seed weight (g)	Seed yield (q/ha)
					Obs.	Adj.	Obs.	Adj.				
1	EC005864	71	169	61.80	4.20	4.12	33.80	35.80	3.80	2.80	26.00	18.45
2	EC010719	78	162	53.60	2.40	2.32	26.80	28.80	3.56	2.40	30.00	14.76
3	EC010720	65	167	57.80	5.00	4.92	54.00	56.00	4.30	2.80	28.00	10.25
4	EC010845	63	166	54.40	3.60	3.52	36.40	38.40	3.70	3.20	27.00	14.96
5	EC025072	68	159	54.80	3.20	3.12	36.40	38.40	4.10	3.40	21.00	10.25
6	EC025192	71	168	59.40	5.80	5.72	39.80	41.80	4.00	3.40	27.00	13.35
7	EC032790	64	163	51.00	3.80	3.72	39.60	41.60	4.10	3.40	29.70	14.55
8	EC034710	70	162	56.20	4.20	4.12	50.00	52.00	4.00	2.60	32.10	14.35
9	EC108908	70	168	61.20	3.60	3.52	16.80	18.80	4.10	2.80	26.00	16.40
10	EC117361	63	166	44.00	2.40	2.32	39.00	41.00	3.70	2.60	27.40	4.10
11	EC117724	74	165	57.80	5.20	5.12	37.60	39.60	3.80	3.00	29.60	4.71
12	EC117726	68	172	61.00	4.40	4.06	60.80	53.57	4.20	3.00	24.50	19.27
13	EC117734	78	171	67.00	3.60	3.26	32.10	24.87	4.10	2.80	30.00	15.78
14	EC117741	72	161	66.80	4.20	3.86	48.40	41.17	4.04	3.40	28.00	14.35
15	EC117744	79	162	68.60	4.60	4.26	53.80	46.57	4.60	3.60	31.00	24.19
16	EC117748	62	161	59.00	4.20	3.86	34.60	27.37	4.10	3.20	28.10	20.50
17	EC117753	80	164	57.00	4.40	4.06	35.60	28.37	4.00	2.80	30.60	22.55
18	EC117758	68	171	66.00	4.20	3.86	38.80	31.57	4.30	3.40	31.00	16.40
19	EC117765	72	165	52.80	4.00	3.66	35.80	28.57	3.80	2.80	23.30	10.25
20	EC117792	63	166	67.80	4.00	3.66	37.00	29.77	4.10	2.80	29.10	11.48
21	EC117795	76	170	55.40	4.00	3.66	55.40	48.17	4.50	3.00	28.80	16.40
22	EC117809	79	168	44.60	5.00	4.66	30.80	23.57	3.40	2.60	27.60	14.35
23	EC117818	70	168	59.40	4.60	4.46	33.20	29.30	3.90	2.60	30.10	11.89
24	EC117842	68	160	59.20	5.20	5.06	41.00	37.10	3.50	2.00	26.00	15.99
25	EC233860	72	169	58.60	4.60	4.46	36.80	32.90	4.00	2.80	31.00	10.20
26	EC243036	79	161	50.00	4.40	4.26	37.00	33.10	4.20	2.80	31.40	19.47
27	EC243525A	79	166	51.40	7.00	6.86	50.20	46.30	3.60	2.80	21.90	14.50
28	EC243584	78	165	57.40	4.60	4.46	50.00	46.10	3.70	2.40	31.90	11.27
29	EC243594	70	172	63.60	4.40	4.26	27.00	23.10	4.00	2.80	24.60	15.37

S.No.	Accession No.	Days to flowering	Days to maturity	Plant height (cm)	No. of Branches/ plant		No. of Pods/plant		Pod length (cm)	No. of grain/pod	100 seed weight (g)	Seed yield (q/ha)
					Obs.	Adj.	Obs.	Adj.				
30	EC243596	75	164	72.40	5.00	4.86	41.00	37.10	4.40	3.00	30.00	5.33
31	EC243608	75	171	55.00	4.40	4.26	43.80	39.90	4.00	2.40	30.50	16.81
32	EC243637	80	168	46.20	4.00	3.86	35.80	31.90	3.90	2.80	32.10	6.15
33	EC243749	76	161	46.00	4.00	3.86	35.00	31.10	2.90	2.40	30.50	16.40
34	EC243756	58	161	66.20	5.00	5.86	45.80	41.57	3.60	2.80	32.00	15.37
35	EC243761	58	161	48.60	2.80	3.66	38.20	33.97	3.90	3.00	27.10	15.37
36	EC243764	81	159	64.20	5.00	5.86	49.80	45.57	5.10	3.20	28.10	12.30
37	EC243770	81	157	66.00	5.20	6.06	50.20	45.97	3.80	3.00	21.10	14.35
38	EC243772	65	154	57.20	5.40	6.26	47.20	42.97	2.80	3.00	27.20	7.17
39	EC243782	62	160	62.00	6.00	6.86	42.00	37.77	4.20	3.00	26.60	16.40
40	EC243786	68	164	56.40	5.60	6.46	53.20	48.97	4.30	2.80	25.60	4.30
41	EC243808	81	170	50.00	3.20	4.06	28.40	24.17	3.60	3.00	27.40	14.35
42	EC243860	77	167	57.40	3.20	4.06	32.00	27.77	4.20	2.80	26.50	14.35
43	EC243895	70	165	59.40	3.60	4.46	42.20	37.97	4.20	2.80	29.20	16.81
44	EC247592	67	169	53.40	5.00	5.86	32.00	27.77	4.80	3.00	28.20	17.42
45	EC248951	81	168	57.80	4.60	5.29	40.60	40.97	4.40	3.60	24.90	17.00
46	EC263624	67	169	60.00	4.60	5.29	34.40	34.77	4.30	3.00	26.50	16.20
47	EC267639	56	169	68.00	5.20	5.89	51.60	51.97	4.02	3.40	25.80	9.22
48	EC267648	79	160	53.80	4.80	5.49	47.00	47.37	3.60	2.60	28.10	18.65
49	EC267649	78	162	59.60	3.80	4.49	54.40	54.77	3.90	3.40	29.30	9.22
50	EC299713	75	158	67.20	3.80	4.49	50.40	50.77	4.10	3.20	28.40	28.70
51	EC323731	65	168	61.20	4.80	5.49	41.60	41.97	4.10	3.20	26.20	12.30
52	EC324677	63	171	66.00	3.80	4.49	45.00	45.37	4.10	3.40	27.90	13.32
53	EC329588	65	167	46.80	3.60	4.29	35.20	35.57	3.80	2.60	28.30	8.20
54	EC329628	71	165	54.00	4.00	4.69	36.20	36.57	4.10	2.80	31.80	20.50
55	EC329643	72	163	54.00	5.00	5.69	42.20	42.57	4.40	3.40	30.10	19.47
56	EC329662	65	169	69.00	3.40	2.59	38.20	40.97	4.50	3.20	32.40	17.42
57	EC329667	85	165	57.40	3.20	2.39	38.20	40.97	3.60	3.00	31.20	14.35
58	EC329668	65	169	44.20	3.60	2.79	40.20	42.97	4.10	3.20	24.20	18.10
59	EC329672	85	161	58.40	4.00	3.19	34.40	37.17	4.10	3.20	29.60	12.71
60	EC329673	72	167	52.60	3.60	2.79	29.80	32.57	3.90	3.20	27.40	10.25
61	EC329677	65	156	74.80	5.20	4.39	54.60	57.37	4.04	3.60	23.40	15.99

S.No.	Accession No.	Days to flowering	Days to maturity	Plant height (cm)	No. of Branches/ plant		No. of Pods/plant		Pod length (cm)	No. of grain/pod	100 seed weight (g)	Seed yield (q/ha)
					Obs.	Adj.	Obs.	Adj.				
62	EC329679	77	171	53.00	3.60	2.79	32.00	34.77	4.90	2.80	31.30	16.40
63	EC329680	58	161	62.60	4.80	3.99	38.20	40.97	4.60	3.20	32.10	25.62
64	EC329681	79	167	45.80	3.40	2.59	30.00	32.77	4.30	3.20	25.90	7.17
65	EC329682	65	171	55.00	4.00	3.19	37.40	40.17	4.00	3.00	29.20	7.20
66	EC329683	76	161	57.20	5.60	4.79	31.00	33.77	4.50	3.20	27.50	11.27
67	EC329691	71	164	55.00	5.60	4.92	37.60	28.04	4.10	2.40	22.10	16.40
68	EC329696	70	161	60.20	2.20	1.52	5.10	-4.46	4.00	2.80	32.60	18.45
69	EC329707	81	166	55.00	4.20	3.52	46.00	36.44	4.80	3.60	31.20	11.27
70	EC329711	71	165	59.60	5.60	4.92	50.20	40.64	3.30	3.20	28.50	13.12
71	EC329713	70	164	55.80	4.00	3.32	28.40	18.84	3.60	3.00	27.40	15.99
72	EC329715	68	153	71.40	6.40	5.72	57.60	48.04	3.80	3.40	32.00	16.40
73	EC329724	67	166	65.20	5.20	4.52	60.20	50.64	3.30	2.40	26.10	26.65
74	EC329725	65	169	57.00	4.60	3.92	52.80	43.24	4.10	3.20	29.80	25.01
75	EC329812	80	171	61.20	4.20	3.52	42.60	33.04	4.40	3.20	30.00	10.25
76	EC343631	70	165	66.20	4.60	3.92	41.00	31.44	5.20	5.40	26.20	15.20
77	EC343749	78	169	65.20	5.20	4.52	44.60	35.04	4.38	2.80	28.50	14.35
78	EC343793	71	166	58.00	5.80	5.66	46.00	48.97	4.00	2.00	24.60	11.28
79	EC343808	75	163	57.80	6.00	5.86	47.40	50.37	4.10	2.60	23.30	12.60
80	EC343855	73	161	60.80	4.20	4.06	56.00	58.97	3.90	3.00	31.20	17.00
81	EC344984	63	169	49.40	4.00	3.86	42.40	45.37	3.30	2.80	24.70	17.42
82	EC351999	80	163	51.40	6.20	6.06	41.80	44.77	3.70	2.80	24.00	13.30
83	EC354985	74	161	67.00	4.00	3.86	27.80	30.77	5.00	3.00	28.10	13.20
84	EC359685	63	164	62.20	3.80	3.66	33.80	36.77	3.90	2.60	28.50	9.20
85	EC361494	75	169	52.40	5.00	4.86	40.00	42.97	3.20	2.80	28.70	14.40
86	EC361496	67	169	69.00	5.00	4.86	38.20	41.17	3.90	3.40	26.60	14.45
87	EC374731	70	167	67.00	5.20	5.06	52.00	54.97	4.00	3.20	30.60	11.70
88	GP-03	87	171	49.60	3.60	3.46	24.20	27.17	3.60	2.80	28.80	4.50
89	GP-04	70	161	62.20	3.80	4.19	33.80	42.10	3.90	2.60	32.00	6.15
90	GP-06	72	165	50.00	2.80	3.19	29.50	37.80	4.20	3.00	29.80	6.97
91	GP-07	71	167	58.80	3.80	4.19	41.80	50.10	4.00	3.40	28.00	15.17
92	GP-09	78	171	49.60	2.80	3.19	34.20	42.50	3.60	3.00	31.30	7.38
93	GP-10	80	166	60.20	3.60	3.99	26.40	34.70	3.80	3.40	26.50	7.17

S.No.	Accession No.	Days to flowering	Days to maturity	Plant height (cm)	No. of Branches/ plant		No. of Pods/plant		Pod length (cm)	No. of grain/pod	100 seed weight (g)	Seed yield (q/ha)
					Obs.	Adj.	Obs.	Adj.				
94	GP-11	74	166	62.60	4.00	4.39	30.20	38.50	4.00	3.30	26.40	8.61
95	GP-12	68	158	58.80	4.40	4.79	32.60	40.90	4.20	3.40	27.70	7.79
96	GP-13	61	163	62.00	5.40	5.79	29.60	37.90	4.00	3.40	28.40	6.15
97	GP-15	72	166	59.40	4.20	4.59	43.20	51.50	4.10	3.40	27.10	10.15
98	GP-16	74	164	57.80	3.80	4.19	32.80	41.10	3.50	2.80	23.40	9.67
99	HT-41	68	159	60.40	3.60	3.99	33.40	41.70	3.60	3.00	26.70	8.10
100	HT-43	59	169	59.60	5.00	5.26	43.80	52.30	3.70	2.80	24.20	12.20
101	HT-44	78	171	54.60	4.00	4.26	34.60	43.10	3.60	3.40	24.80	15.60
102	IC276939	73	170	61.80	3.80	4.06	43.00	51.50	3.90	2.60	24.00	11.20
103	IC329712	68	161	55.20	3.40	3.66	44.40	52.90	3.90	2.80	26.80	14.30
104	IC331561	65	163	55.60	4.60	4.86	25.20	33.70	4.10	3.00	22.90	13.20
105	IC332102	75	166	63.60	7.00	7.26	33.20	41.70	3.90	2.60	27.80	15.20
106	IC332138	85	171	53.40	3.80	4.06	23.40	31.90	3.90	2.60	26.80	10.00
107	IC346272	73	161	52.20	5.60	5.86	39.50	48.00	4.30	3.20	30.10	10.20
108	IC348948	60	161	66.80	2.80	3.06	24.60	33.10	3.80	2.80	28.10	8.40
109	IC361470	71	164	51.20	4.40	4.66	51.00	59.50	4.20	3.00	30.40	6.97
110	IC361494	63	175	57.60	5.00	5.26	33.00	41.50	3.80	4.40	26.50	6.56
Means for check varieties												
	P R T 7 (c)	73.50	164.90	61.12	3.87	3.87	38.44	38.44	4.31	3.08	26.65	11.63
	P R T 12 (c)	71.10	165.50	62.06	4.22	4.22	36.30	36.30	3.86	3.11	28.45	12.94
	V H 82-1 (c)	71.70	167.20	54.24	4.48	4.48	39.57	39.57	3.77	2.96	27.02	11.90
	Minimum	**56.00**	**153.00**	**44.00**	**2.20**	**1.52**	**5.10**	**-4.46**	**2.80**	**2.00**	**21.00**	**4.10**
	Maximum	**87.00**	**175.00**	**74.80**	**7.00**	**7.26**	**60.80**	**59.50**	**5.20**	**5.40**	**32.60**	**28.70**
	Mean	**71.43**	**165.20**	**58.26**	**4.37**	**4.37**	**39.30**	**39.30**	**4.00**	**3.01**	**27.89**	**13.44**
	CD (0.05)	**16.96**	**15.11**	**26.40**	**1.15**	**-**	**12.67**	**-**	**1.55**	**1.13**	**7.71**	**13.14**
	CV (%) Error	**6.67**	**5.94**	**10.38**	**0.45**	**-**	**4.98**	**-**	**0.61**	**0.45**	**3.03**	**5.17**
	CV (%) Phenotypic	**9.38**	**2.55**	**11.07**	**20.99**	**24.03**	**23.73**	**24.45**	**9.90**	**14.00**	**9.68**	**36.22**

Table 127. Multilocational evaluation germplasm lines in Kalingada at S.K. Nagar - 2006 (Plains)

S.No.	Accession name	Days to flowering
1	Denap	76
2	Mahudi-4	80
3	Motimahudi	79
4	Panchwada	82
5	Rampura gol	77
6	Rampura gol medium white	84
7	Rampura Lambgol	80
8	Sidhpur	82
9	SKNK 001	80
10	SKNK 001xSKNK 007	-
11	SKNK 001xSKNK 007	-
12	SKNK 001xSKNK 008F1	-
13	SKNK 002	66
14	SKNK 002xSKNK 012F3	84
15	SKNK 003	78
16	SKNK 003 x SKNK 012	76
17	SKNK 003x SKNK 010 F3	75
18	SKNK 004	79
19	SKNK 004xLocal F1	-
20	SKNK 004xSKNK 010F3	73
21	SKNK 004xSKNK 013F3	80
22	SKNK 004xSKNK 015F2	-
23	SKNK 004xSKNK 016F1	-
24	SKNK 004xSKNK 017	-
25	SKNK 004xSKNK 03F1	-
26	SKNK 005	80
27	SKNK 006	64
28	SKNK 007 x Local F3	79
29	SKNK 007 x SKNK 012	77
30	SKNK 007xLocal F1	-
31	SKNK 007xSKNK 012 F3	74
32	SKNK 007xSKNK 012 F3	-
33	SKNK 007xSKNK 012F2	-
34	SKNK 007xSKNK 08F1	-

S.No.	Accession name	Days to flowering
35	SKNK 011	78
36	SKNK 015	80
37	SKNK 016	81
38	SKNK 017	80
39	SKNK 018	78
40	SKNK 019	81
41	SKNK 021	81
42	SKNK 402	-
43	SKNK 405 gol	-
44	Vadavas	83
45	Vasdal-2	78
	Minimum	**64.00**
	Maximum	**84.00**
	Mean	**78.23**
	CV (%) Phenotypic	**5.65**

Table 128. Promising lines in Kankoda germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
Rahuri (Accessions 90)			
1.	Giirth of fruit (cm)	6.70-12.40	PK-60, PK-14, PK-19, PK-26, PK-30 (>12.00 cm)
2.	Length of fruit (cm)	4.00-8.50	PK-12, PK-7, PK-57, PK-80, PK-39 (> 7.5 cm)
3.	No of fruits	70.00-224.00	PK-9,PK-12, PK-46, PK-22, PK-53 (> 180)
4.	Weight of fruits (kg)	0.65-1.95	PK-12, PK-20, PK-15, PK-46, PK-53 (> 1700 kg)

Table 129. Multilocational evaluation germplasm lines in Kankoda at Rahuri - 2006 (Plains)

S.No.	Accession No.	Giirth of fruit (cm)	Length of fruit (cm)	No of fruits	Weight of fruits (kg)
1	PK-1	11.9	6.0	85	1.500
2	PK-2	11.7	7.6	107	1.600
3	PK-3	12.0	8.0	112	1.170
4	PK-4	11.4	8.0	180	1.400
5	PK-5	10.4	7.4	91	0.890
6	PK-6	11.0	7.0	140	1.400
7	PK-7	12.0	8.4	185	1.800
8	PK-8	10.9	7.1	70	0.650
9	PK-9	9.8	8.0	224	1.620
10	PK-10	10.0	7.0	185	1.750
11	PK-11	12.0	7.2	140	1.400
12	PK-12	11.2	8.5	195	1.950
13	PK-13	10.4	7.9	115	1.400
14	PK-14	12.1	6.2	180	1.600
15	PK-15	9.9	7.8	185	1.850
16	PK-16	10.2	8.0	92	0.950
17	PK-17	11.0	6.2	84	0.790
18	PK-18	11.8	8.0	125	1.180
19	PK-19	12.1	7.0	94	0.890
20	PK-20	11.8	8.0	115	1.900
21	PK-21	12.0	6.1	145	1.300
22	PK-22	9.1	7.4	190	1.610
23	PK-23	8.8	6.7	110	0.990
24	PK-24	8.9	7.9	90	0.950
25	PK-25	10.0	8.0	145	1.300
26	PK-26	12.1	7.5	165	1.450
27	PK-27	11.9	8.1	115	1.400
28	PK-28	11.5	6.4	180	1.620
29	PK-29	12.0	7.8	165	1.560
30	PK-30	12.1	8.1	130	1.230
31	PK-31	8.5	7.9	125	1.060
32	PK-32	10.1	8.0	145	1.370
33	PK-33	9.9	6.4	135	1.210
34	PK-34	7.5	7.6	98	0.980
35	PK-35	9.1	7.5	112	1.050

S.No.	Accession No.	Giirth of fruit (cm)	Length of fruit (cm)	No of fruits	Weight of fruits (kg)
36	PK-36	8.8	6.9	85	0.900
37	PK-37	11.1	8.1	125	1.060
38	PK-38	11.7	7.8	105	1.300
39	PK-39	11.1	8.2	150	1.270
40	PK-40	10.0	6.0	94	0.940
41	PK-41	6.8	7.0	115	1.090
42	PK-42	8.6	7.9	120	1.140
43	PK-43	12.0	8.1	110	0.990
44	PK-44	11.2	6.9	110	0.950
45	PK-45	10.7	7.7	90	0.950
46	PK-46	9.5	7.8	190	1.800
47	PK-47	7.5	8.2	148	1.460
48	PK-48	7.9	8.0	135	1.230
49	PK-49	10.0	7.1	130	1.230
50	PK-50	7.5	7.4	120	1.150
51	PK-51	9.8	7.9	110	1.100
52	PK-52	8.8	6.4	115	1.130
53	PK-53	10.0	7.2	190	1.800
54	PK-54	12.0	7.7	170	1.650
55	PK-55	10.0	7.5	154	1.310
56	PK-56	9.8	6.5	150	1.450
57	PK-57	7.9	8.3	135	1.230
58	PK-58	8.5	7.4	110	1.000
59	PK-59	11.2	7.9	125	1.150
60	PK-60	12.4	6.1	128	1.250
61	PK--61	10.0	8.0	158	1.500
62	PK-62	10.1	7.9	165	1.480
63	PK-63	7.9	7.6	170	1.600
64	PK-64	8.7	8.0	166	1.570
65	PK-65	10.5	6.4	175	1.640
66	PK-66	11.4	7.5	180	1.700
67	PK-67	12.0	6.3	132	1.300
68	PK-68	9.9	8.0	128	1.240
69	PK-69	6.7	7.9	136	1.750
70	PK-70	7.9	7.7	105	0.950
71	PK-71	8.0	6.4	98	0.950
72	PK-72	10.3	8.0	134	1.270
73	PK-73	7.3	7.8	140	1.400

S.No.	Accession No.	Giirth of fruit (cm)	Length of fruit (cm)	No of fruits	Weight of fruits (kg)
74	PK-74	6.8	7.9	135	1.200
75	PK-75	9.4	6.4	126	1.220
76	PK-76	11.0	7.3	150	1.420
77	PK-77	10.4	8.0	165	1.460
78	PK-78	9.0	6.9	115	1.090
79	PK-79	10.9	7.4	140	1.400
80	PK-80	11.5	8.2	131	1.230
81	PK-81	7.5	8.0	125	1.210
82	PK-82	10.8	6.4	102	1.020
83	PK-83	11.6	6.5	107	1.100
84	PK-84	8.1	7.6	117	1.150
85	PK-85	12.0	7.5	138	1.170
86	PK-86	10.8	6.4	145	1.400
87	PK-87	9.5	7.9	154	1.460
88	PL88	6.8	6.0	165	1.600
89	PK-89	8.4	4.0	172	1.650
90	PK-90	7.5	6.4	115	1.140
	Minimum	**6.70**	**4.00**	**70.00**	**0.65**
	Maximum	**12.40**	**8.50**	**224.00**	**1.95**
	Mean	**10.05**	**7.37**	**135.08**	**1.31**
	CV (%) Phenotypic	**15.96**	**10.54**	**23.33**	**21.48**

Table 130. Promising lines in Jatropha germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
Hisar (Accessions 13)			
1.	Height (cm)	122.00-220.00	JH-1, SKN (Big), Hansraj, JH-6, JH-2 (> 205.00 cm)
2.	Girth (cm)	17.30-25.70	JH-1, JH-4, JH-7, SKN (Big), JH-2 (> 23.30cm)
3.	Primary branches/plant	6.00-19.00	JH-6, JH-1, JH-8, SKNA-4, Chhattarpati (> 10.00)
4.	Clusters/plant	6.00-17.00	JH-7, JH-6, JH-1, JH-8, JH-3 (> 10.00)
5.	Fruits/plant	37.00-112.00	JH-1, JH-7, JH-6, ISJ-1,JH-3 (>83.00)
6.	Seed yield/ plant (g)	125.00-250.00	JH-7, JH-1, JH-4, JH-6, ISJ-1 (>190.00g)
7.	Size of the fruits (cm)	1.53-1.81	JH-1, JH-2, SKN (Big), Chhattarpati, JH-3 (>1.70 cm)
8.	Seeds/fruit	3.00-3.00	JH-1, JH-2, SKN (Big), Chhattarpati, JH-3 (> 2.50)
CSRRI Farm, Karnal (Accessions 22)			
1.	No. of branches per plant	3.33-10.00	Hansraj, TNMC-19, TNMC-22, TNMC-33, TNMC-23 (> 7.67)
2.	No. of fruit per plant	1.00-89.67	Cutting, TNMC-23, TNMC-22, CSMCRT-9, S.K.N.Big (> 34.00)
3.	Fruit size length (cm)	2.00-3.17	TNMC-22, TNMC-5, Urlikeendan, CSMCRT-4, Cutting (> 2.97 cm)
4.	Fruit size width (cm)	1.90-2.80	Hansraj, TNMC-5, TNMC-22, Urlikeendan, TNMC-28 (> 2.60 cm)
5.	Fruit yield per plant (g)	1.90-63.33	Cutting, TNMC-6, TNMC-4, TNMC-23, TNMC-5, TNMC-22 (> 23.70 g)
6.	Seed yield per plant (g)	1.50-58.20	Cutting, TNMC-22, TNMC-4, TNMC-23 (> 8.50 g)

Table 131. Multilocational evaluation of germplasm lines in Jatropha at Hisar - Plains (2006)

Sr. No.	Genotypes	Height (cm)	Girth (cm)	Primary branches/plant	Clusters/ plant	Fruits/ plant	Seed yield/ plant (g)	Size of the fruits (cm)	Seeds/ fruit
1	Chhattarpati	189.00	21.10	11.00	9.00	83.00	175.00	1.72	3.00
2	Hansraj	211.00	23.30	9.00	6.00	50.00	125.00	1.61	3.00
3	ISJ-1	155.00	20.20	10.00	9.00	99.00	199.00	1.61	3.00
4	JH-1	220.00	25.70	18.00	14.00	112.00	216.00	1.81	3.00
5	JH-2	201.00	23.90	10.00	10.00	61.00	150.00	1.74	3.00
6	JH-3	122.00	18.00	9.00	12.00	90.00	190.00	1.71	3.00
7	JH-4	188.00	25.10	8.00	7.00	75.00	210.00	1.68	3.00
8	JH-6	207.00	22.90	19.00	15.00	101.00	205.00	1.70	3.00
9	JH-7	190.00	24.40	6.00	17.00	103.00	250.00	1.69	3.00
10	JH-8	185.00	22.00	13.00	13.00	77.00	170.00	1.69	3.00
11	Phoole J-1	193.00	22.50	10.00	8.00	81.00	172.00	1.53	3.00
12	SKN (Big)	215.00	24.00	8.00	8.00	37.00	186.00	1.73	3.00
13	SKNA-4	125.00	17.30	13.00	10.00	73.00	176.00	1.71	3.00
	Minimum	**122.00**	**17.30**	**6.00**	**6.00**	**37.00**	**125.00**	**1.53**	**3.00**
	Maximum	**220.00**	**25.70**	**19.00**	**17.00**	**112.00**	**250.00**	**1.81**	**3.00**
	Mean	**184.69**	**22.34**	**11.08**	**10.62**	**80.15**	**186.46**	**1.69**	**3.00**
	CV (%) Phenotypic	**17.21**	**11.56**	**34.47**	**31.37**	**27.09**	**16.82**	**4.15**	**0.00**

Table 132. Germplasm evaluation of Jatropha for semi reclaimed soil at CSSRI, Farm, Karnal

S.No.	Genotype	No of branches/ plant	No. of fruit/ plant	Fruit size length (cm)	Fruit size width (cm)	Fruit yield/ plant(g)	Seed yield/ plant (g)
1	CSMCRT-4	7.00	10.00	3.03	2.57	17.00	5.87
2	CSMCRT-9	3.33	52.33	2.67	2.30	23.70	1.50
3	Cutting	4.67	89.67	3.00	2.60	63.33	58.20
4	Hansraj	10.00	20.33	2.90	2.80	5.73	2.03
5	Hisar J-1	6.67	15.00	2.90	2.50	-	-
6	Phule J-1	7.67	30.67	2.63	2.33	1.90	3.20
7	Raipur	6.33	32.67	2.80	2.43	7.50	8.50
8	S.K.N.Big	3.33	37.00	2.87	2.53	2.90	3.57
9	S.K.N.J-2	5.67	25.33	2.67	2.33	6.05	2.03
10	SDAUJ-1	5.00	2.00	-	-	-	-
11	TNMC-19	10.00	30.33	2.73	2.43	6.00	1.50
12	TNMC-2	6.00	1.00	2.20	2.30	-	-
13	TNMC-20	3.67	32.00	2.83	2.37	17.20	4.50
14	TNMC-22	9.00	58.00	3.17	2.70	30.27	19.13
15	TNMC-23	8.00	67.00	2.30	2.10	32.90	17.50
16	TNMC-28	5.67	24.00	2.87	2.63	7.30	8.40
17	TNMC-33	8.33	18.33	2.47	2.13	-	-
18	TNMC-4	6.00	34.00	2.80	2.30	37.80	19.00
19	TNMC-5	7.00	31.00	3.07	2.77	31.37	8.30
20	TNMC-6	6.00	8.00	2.97	2.60	43.20	-
21	TNMC-7	5.00	8.00	2.00	1.90	-	-
22	Urlikeendan	4.67	13.00	3.03	2.63	14.97	2.40
	Minimum	**3.33**	**1.00**	**2.00**	**1.90**	**1.90**	**1.50**
	Maximum	**10.00**	**89.67**	**3.17**	**2.80**	**63.33**	**58.20**
	Mean	**6.32**	**29.08**	**2.76**	**2.44**	**20.54**	**10.35**

Table 133. Promising lines in Simarouba germplasm for various characters at various locations (Plains).

S.No.	Characters	Range	Promising lines
Rahuri (Accessions 64)			
1.	Plant height (cm)	1.50-4.00	PS-6, PS-9, PS-52, PS-4, PS-33 (>3.500 cm)
2.	Plant spread (m)	2.10-10.90	PS-50, PS-26, PS-11, PS-59, PS-52 (>8.70 m)
3.	No of branches	2.00-10.00	PS-4, PS-14, PS-36, PS-9, PS-3 (>7.00)
4.	Stem girth (cm)	11.00-37.00	PS-58, PS-54, PS-32, PS-59, PS-40(>30.00 cm)

Table 134. Evaluation of germplasm lines in Simarouba at Rahuri - 2006 (Plains)

S.No.	Accession No.	Plant height (cm)	Plant spread (m)	No of branches	Stem girth (cm)
1	PS-1	3.25	5.60	4.00	25.00
2	PS-2	2.50	3.50	7.00	30.00
3	PS-3	3.50	7.00	8.00	22.00
4	PS-4	3.70	6.00	10.00	28.00
5	PS-5	3.20	5.90	7.00	23.00
6	PS-6	4.00	8.00	6.00	28.00
7	PS-7	3.20	5.30	6.00	30.00
8	PS-8	3.40	6.90	7.00	26.00
9	PS-9	3.80	5.00	9.00	25.00
10	PS-10	2.50	4.20	5.00	25.00
11	PS-11	3.40	9.00	5.00	33.00
12	PS-12	3.00	7.00	6.00	20.00
13	PS-13	3.60	8.80	7.00	27.00
14	PS-14	1.65	2.50	10.00	13.00
15	PS-15	2.85	3.60	5.00	35.00
16	PS-16	3.00	3.30	5.00	18.00
17	PS-17	2.50	5.00	5.00	19.00
18	PS-18	2.30	3.10	2.00	17.00
19	PS-19	1.50	2.90	3.00	11.00
20	PS-20	2.00	4.00	5.00	15.00
21	PS21	2.10	2.70	5.00	13.00
22	PS-22	1.80	3.20	2.00	20.00
23	PS-23	2.00	4.00	6.00	17.00
24	PS-24	2.00	4.40	4.00	15.00
25	PS-25	2.70	6.40	5.00	20.00
26	PS-26	3.50	9.00	3.00	30.00
27	PS-27	3.00	8.20	4.00	22.00
28	PS-28	2.50	8.50	4.00	25.00
29	PS-29	1.80	3.20	5.00	15.00
30	PS-30	2.10	5.00	7.00	20.00
31	PS-31	2.00	2.10	3.00	15.00
32	PS-32	3.50	6.80	7.00	35.00
33	PS-33	3.70	7.00	6.00	33.00
34	PS-34	1.90	4.40	2.00	20.00
35	PS35	3.00	6.40	6.00	30.00

S.No.	Accession No.	Plant height (cm)	Plant spread (m)	No of branches	Stem girth (cm)
36	PS-36	3.50	8.30	9.00	32.00
37	PS-37	2.50	6.90	5.00	35.00
38	PS-38	2.50	3.30	3.00	25.00
39	PS-39	3.60	6.00	3.00	34.00
40	PS-40	3.60	7.00	6.00	35.00
41	PS-41	2.80	8.30	6.00	27.00
42	PS-42	3.50	6.00	3.00	33.00
43	PS-45	2.40	7.70	3.00	27.00
44	PS-46	2.60	3.30	5.00	15.00
45	PS-47	3.00	4.10	4.00	24.00
46	PS-48	2.60	6.70	2.00	26.00
47	PS-50	3.00	10.90	3.00	35.00
48	PS-51	3.50	6.80	4.00	28.00
49	PS-52	3.80	8.80	3.00	32.00
50	PS-53	3.50	8.70	3.00	35.00
51	PS-54	3.60	7.20	6.00	36.00
52	PS-55	3.50	5.20	4.00	27.00
53	PS-56	2.40	2.50	2.00	15.00
54	PS-57	3.50	5.50	4.00	28.00
55	PS-58	3.50	8.10	3.00	37.00
56	PS-59	3.20	9.00	6.00	35.00
57	PS-60	2.50	4.40	4.00	20.00
58	PS-61	2.50	5.80	5.00	22.00
59	PS-62	2.80	6.80	5.00	25.00
60	PS-63	2.70	4.20	4.00	23.00
61	PS-64	2.40	4.90	2.00	26.00
62	PS-65	3.40	6.00	4.00	27.00
63	PS-66	2.50	6.40	3.00	32.00
64	PS-67	2.60	6.30	4.00	22.00
	Minimum	**1.50**	**2.10**	**2.00**	**11.00**
	Maximum	**4.00**	**10.90**	**10.00**	**37.00**
	Mean	**2.87**	**5.83**	**4.83**	**25.28**
	CV (%) Phenotypic	**22.01**	**35.18**	**40.18**	**27.44**

QUALITY ANALYSIS

IV. QUALITY ANALYSIS

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

4.1 Rice bean

4.1.1 AVT on Ricebean, Bangalore:

Seeds of 20 genotypes from Bangalore Centre were analyzed for protein, trytophan, methionine and free phenol content (Table 135). Protein content varied from 18.2 to 21.3 per cent with an average value of 19.9 per cent. Trytophan, methionine (% on crude protein basis) and free phenol content ranged from 0.64-0.94, 0.79-0.98 and 0.16-0.24 per cent with an average value of 0.78%, 0.87% and 0.19%, respectively.

The promising genotypes having high protein and methionine content were:

Genotypes	Protein (%)	Genotypes	Methionine (%
LRB-330	21.3	PRR-2	0.98
LRB-303	21.2	LRB-234	0.93
RBL-1	20.9	RBL-1	0.92
RBL-50	20.5	RBL-35	0.92
RBL-99	20.5	RBL-188	0.92
KHRB-1	20.4	LRB-355	0.92
RBL-6 (C)	20.7	PRR-9402	0.92
		RBL-6 (C)	0.88

The promising genotypes having high trytophan and free phenol content were:

Genotypes	Tryptophan (%)	Genotypes	Free phenol (%)
PRR-2	0.94	PRR-9402	0.24
PRR-9302	0.91	LRB-351	0.23
LRB-355	0.87	PRR-2	0.22
KHRB-1	0.87	LRB-234	0.21
RBL-6 (C)	0.70	LRB-122	0.21
		RBL-6 (C)	0.18

4.1.2 AVT on Ricebean, Ranichauri:

Seeds of 18 genotypes from Ranichauri Centre were analyzed for protein, trytophan, methionine and free phenol content (Table 136). Protein content varied from 18.9 to 21.8 per cent with an average value of 20.5 per cent. Trytophan, methionine (% on crude protein basis) and free phenol content ranged from 0.69-0.91, 0.78-0.98 and 0.16-0.23 per cent with an average value of 0.82%, 0.87% and 0.19%, respectively.

The promising genotypes having high protein and methionine content were:

Genotypes	Protein (%)	Genotypes	Methionine (%)
RBL-1	21.8	RB-3-016	0.98
LRB-463	21.7	LRB-005	0.97
LRB-023	21.5	Totru (Local)	0.94
LRB-309	21.4	VRB-001	0.92
Totru (Local)	19.5	PRR-9401	0.92
RBL-6 (C)	21.4	RBL-6 (C)	0.86

The promising genotypes having high trytophan and free phenol content were:

Genotypes	Tryptophan (%)	Genotypes	Free phenol (%)
LRB-005	0.91	RB-3-016	0.23
Totru (Local)	0.89	LRB-005	0.22
LRB-009	0.88	LRB-35-1	0.21
PRR-2	0.87	LRB-463	0.21
LRB-664	0.86	Totru (Local)	0.19
RBL-6 (C)	0.77	RBL-6 (C)	0.21

4.2 Buckwheat

4.2.1 AVT on Buckwheat, Sangla:

Seeds of 20 genotypes from Sangla center were analyzed for protein, free phenol and lysine content which varied from 9.4-12.0%, 0.27-0.94% and 4.2-5.6 (g/16gN) with an average value of 10.7%, 0.65% and 5.0 (g/16gN), respectively (Table 137).

The promising genotypes having high protein, high free phenol and high lysine content were:

Genotypes	Protein (%)	Genotypes	Free phenol (%)	Genotypes	Lysine (g/16gN)
IC-323724	11.7	SMLBW-4	0.94	SMLBW-3	5.6
IC-382287	11.5	IC-329456	0.92	IC-310095	5.5
IC-310045	11.4	IC-274489	0.87	IC-274438	5.4
IC-322729	11.1	IC-341593	0.86	IC-274489	5.3
IC-274489	11.1	Shimla B-1	0.78	Shimla B-1	5.3
VL-7 (C)	12.0	VL-7 (C)	0.27	PRB-1 (C)	4.8
PRB-1 (C)	11.5	PRB-1 (C)	0.57	Himpriya (C)	4.6
Himpriya (C)	11.1	Himpriya (C)	0.52		

4.2.2 AVT on Buckwheat, Ranichauri :

Seeds of 19 genotypes from Sangla center were analyzed for protein, free phenol and lysine content which varied from 8.2-15.1%, 0.38-0.75% and 4.1-5.2 (g/16gN) with an average value of 11.5%, 0.60% and 4.6 (g/16gN), respectively (Table 137).

The promising genotypes having high protein, high free phenol and high lysine content were:

Genotypes	Protein (%)	Genotypes	Free phenol (%)	Genotypes	Lysine (g/16gN)
SMLBW-4	13.4	SMLBW-4	0.75	IC-274438	5.2
IC-382287	13.0	IC-329456	0.74	EC-272442	5.2
IC-274439	12.7	IC-341593	0.73	SMLBW-3	5.2
EC-323724	12.3	IC-274439	0.71	Himpriya (C)	5.2
EC-323729	12.2	IC--341679	0.70	PRB-1 (C)	4.6
VL-7 (C)	15.1	Shimla B-1 (C)	0.65		
PRB-1 (C)	13.3	Himpriya (C)	0.55		
Shimla B-1 (C)	12.2	PRB-1 (C)	0.47		
Himpriya (C)	11.1				

The promising genotype based over both the locations viz. Ranichauri and Sangla, having high protein and high free phenol and high lysine content were:

Genotypes	Protein (%)	Genotypes	Free phenol (%)	Genotypes	Lysine (g/16gN)
VL-7 (C)	13.55	SMLBW-4	0.85	SMLBW-3	5.40
PRB-1	12.40	IC-329456	0.83	IC-272442	5.20
IC-382287	12.25	IC-341593	0.80	IC-310095	5.05
SMLBW-4	12.10	SMLBW-3	0.72	SMLBW-5	5.05

4.3 Grain Amaranth

4.3.1 AVT on Grain Amaranth, Ranichauri:

Seeds of Eleven genotypes were analyzed for protein and lysine content. Protein ranged from 12.7 to 14.2% with an average value of 13.4%. Lysine content ranged from 4.4 to 5.5 (g/16gN) with an average value of 4.9 (g/16gN) (Table 138).

The promising genotypes were:

Genotypes	Protein (%)	Genotypes	Lysine (g/16 gN)
LPKB-504-55	14.2	PRA 2005-1	5.5
VL 0344	14.1	PRA-2005-2	5.3
PRA-2	13.8	PRA-3	5.1
IC-35407	13.8	Annapurna (C)	5.3
Annapurna (C)	13.3		

4.4 Jatropha

4.4.1 Jatropha at SK Nagar:

Eight genotypes from S.K. Nagar were analyzed for oil content on the basis of kernel content. The best genotype for oil content was Chhatrapati having 57.7% followed by SKN (Big) (56.2%) (Table 139).

Table 135: AVT on Ricebean at Bangalore Centre

Sr. No.	Genotypes	Protein (%)	Tryptophan (% on crude protein basis)	Methionine (% on crude protein basis)	Free phenol (%)
1	KHRB-1	20.4	0.87	0.89	0.18
2	LRB-122	18.8	0.70	0.87	0.21
3	LRB-224	18.5	0.67	0.87	0.19
4	LRB-234	19.0	0.70	0.93	0.21
5	LRB-303	21.2	0.80	0.83	0.20
6	LRB-330	21.3	0.84	0.79	0.19
7	LRB-349	20.4	0.80	0.84	0.17
8	LRB-351	20.4	0.77	0.79	0.23
9	LRB-354	18.8	0.80	0.86	0.20
10	LRB-355	19.8	0.87	0.92	0.17
11	PRR-2	19.3	0.94	0.98	0.22
12	PRR-9302	18.7	0.91	0.89	0.18
13	PRR-9402	19.4	0.64	0.92	0.24
14	RBL-1	20.9	0.70	0.92	0.20
15	RBL-6	20.7	0.70	0.88	0.18
16	RBL-33-1	18.2	0.74	0.82	0.19
17	RBL-35	20.4	0.74	0.92	0.16
18	RBL-50	20.5	0.70	0.80	0.18
19	RBL-99	20.5	0.77	0.85	0.19
20	RBL-188	19.9	0.84	0.92	0.19
	Mean	**19.9**	**0.78**	**0.87**	**0.19**
	Range	**18.2-21.3**	**0.64-0.94**	**0.79-0.98**	**0.16-0.24**

Table 136: Ricebean from Ranichauri Centre

Sr. No	Genotypes	Protein	Trytophan	Methionin	Free Phenols
1	LRB-005	18.9	0.91	0.97	0.22
2	LRB-009	21.4	0.88	0.78	0.20
3	LRB-010	20.4	0.84	0.85	0.17
4	LRB-013	21.1	0.77	0.84	0.19
5	LRB-022	21.2	0.84	0.79	0.19
6	LRB-023	21.5	0.78	0.82	0.18
7	LRB-309	21.4	0.78	0.82	0.16
8	LRB-35-1	20.9	0.82	0.91	0.21
9	LRB-463	21.7	0.85	0.81	0.21
10	LRB-664	20.8	0.86	0.91	0.18
11	PRR-1	19.5	0.84	0.89	0.19
12	PRR-2	21.4	0.87	0.88	0.17
13	PRR-9401	19.5	0.69	0.92	0.20
14	RB-3-016	16.5	0.77	0.98	0.23
15	RBL-1	21.8	0.74	0.83	0.17
16	RBL-6	21.4	0.77	0.86	0.21
17	Totru (Local)	19.5	0.89	0.94	0.19
18	VRB-001	19.3	0.78	0.92	0.18
	Mean	**20.5**	**0.82**	**0.87**	**0.19**
	Range	**18.9-21.8**	**0.69-0.91**	**0.78-0.98**	**0.16-0.23**

Table 137. Quality analysis of AVT on Buckwheat at Sangla and Ranichauri

S. No.	Genotypes	Protein (%)			Free phenol (%)			Lysine (g/16gN)		
		Sangla	Ranichauri	Mean	Sangla	Ranichauri	Mean	Sangla	Ranichauri	Mean
1	IC-272442	9.70	8.20	8.95	0.55	0.63	0.59	5.20	5.20	5.20
2	IC-274438	11.00	12.30	11.65	0.65	0.39	0.52	5.40	4.20	4.80
3	IC-274489	11.10	12.20	11.65	0.87	0.40	0.64	5.30	4.70	5.00
4	IC-310045	11.40	9.90	10.65	0.58	0.61	0.60	4.80	5.20	5.00
5	IC-310095	10.50	12.70	11.60	0.69	0.71	0.70	5.50	4.60	5.05
6	IC-322729	11.10	10.10	10.60	0.32	0.60	0.46	4.60	4.60	4.60
7	IC-323724	11.70	10.80	11.25	0.27	0.56	0.42	4.20	4.60	4.40
8	IC-329456	10.10	11.00	10.55	0.92	0.74	0.83	5.20	4.50	4.85
9	IC-341593	9.80	10.10	9.95	0.86	0.73	0.80	5.40	3.90	4.65
10	IC-341674	10.00	11.80	10.90	0.75	0.68	0.72	4.80	4.20	4.50
11	IC--341679	10.30	11.70	11.00	0.73	0.70	0.72	5.10	4.80	4.95
12	IC-382287	11.50	13.00	12.25	0.68	0.61	0.65	5.10	4.80	4.95
13	PRB-1	11.50	13.30	12.40	0.57	0.47	0.52	4.80	4.60	4.70
14	SMLBW-3	9.40	9.50	9.45	0.77	0.67	0.72	5.60	5.20	5.40
15	SMLBW-4	10.80	13.40	12.10	0.94	0.75	0.85	4.80	4.20	4.50
16	SMLBW-5	10.40	9.50	9.95	0.65	0.59	0.62	5.30	4.80	5.05
17	HIMPRIYA (C)	11.10	11.10	11.10	0.52	0.55	0.54	4.60	5.20	4.90
18	Sangla (C)	11.10	-	11.10	0.65	-	0.65	4.60	-	4.60
19	Shimla B-1 (C)	10.40	12.20	11.30	0.78	0.65	0.72	5.50	4.60	5.05
20	VL-7 (C)	12.00	15.10	13.55	0.27	0.38	0.33	4.40	4.10	4.25
	Mean	**10.75**	**11.47**	**11.10**	**0.65**	**0.60**	**0.63**	**5.01**	**4.63**	**4.82**
	Maximum	**9.40**	**8.20**	**8.95**	**0.27**	**0.38**	**0.33**	**4.20**	**3.90**	**4.25**
	Minimum	**12.00**	**15.10**	**13.55**	**0.94**	**0.75**	**0.85**	**5.60**	**5.20**	**5.40**

Table 138: Grain Amaranth Ranichauri Centre

Sr. No.	Genotypes	Protein (%)	Lysine (g/16 gN)
1	IC-35407	13.8	4.9
2	IC-42264	13.1	4.8
3	LPHB-04-60	13.2	4.8
4	LPKB-504-55	14.2	4.4
5	PRA-1	13.1	4.8
6	PRA-2	13.8	4.7
7	PRA-3	12.7	5.1
8	PRA-2005-1	13.2	5.5
9	PRA-2005-2	12.9	5.3
10	VL 90344	14.1	4.7
11	Annapurna (C)	13.3	5.3
	Mean	**13.4**	**4.9**
	Range	**12.7- 14.2**	**4.4-5.5**

Table 139: Jatropha at SK Nagar Centre

Sr. No.	Genotypes	Oil (%)
1	Chhatrapati	57.7
2	Hansraj	56.2
3	ISS-1	54.8
4	JH-1	54.4
5	Phule J-1	52.5
6	SKN (Big)	56.2
7	SKNJ-	56.6
8	Urlikanchan	55.1

AGRONOMY

V. AGRONOMY

Thirteen agronomic experiments, five on grain amaranth, two on buckwheat, four on rice bean and one each on *Jatropha* and Karingada were formulated to be conducted during the year 2006. Out of these, results of 11 agronomic experiments were received. Centre-wise details of experiments are presented in table 140 while the findings are discussed below:

5.1 GRAIN AMARANTH (*Amaranthus sp.*)

Five experiments related to: (i) response of promising genotypes to fertilizer dose and spacing, (ii) integrated nutrient management, (iii) effect of sowing time and spacing, (iv) evaluation of organic sources for N-management and (v) popularization of amaranth in farmer's fields were conducted. Experiment wise details are as follows:

Experiment 1: Effect of spacing and fertilizer levels on different genotypes of amaranth

In order to work out the fertilizer and spatial requirement of recommended varieties of grain amaranth, this experiment was started in 2005 at Bangalore, Bhubaneswar and S.K. Nagar. The treatments comprised of five varieties of grain amaranth viz. BGA-2 (V_1), GA-1 (V_2), GA-2 (V_3), Suvarna (V_4) and Annapurna (V_5); two fertilizer doses (Recommended-F_1 and 75% of recommended-F_2) and two spacings (30x15 cm – S_1 and 45x15 cm – S_2). The experiment was laid out in Factorial Randomized Block Design with three replications.

A perusal of data in table 141 revealed that grain amaranth varieties BGA-2 and Suvarna outyielded the rest of varieties at Bangalore and Bhubaneswar, whereas GA-2 gave the highest grain yield at S.K. Nagar. Cv. Annapurna was observed to be the earliest as well as the lowest yielder at all the three locations. Also, the grain yield of amaranth was observed to be higher when given recommended dose (F_1) of fertilizer was applied than that obtained under 75% of recommended dose (F_2). Adoption of wider row spacing (S_2 – 45x15 cm)

resulted in higher grain yield at Bangalore, while on the other hand, closer spacing (S_1 – 30x15 cm) resulted in better grain yield at Bhubaneswar and S.K. Nagar.

Experiment 2: Integrated nutrient management studies in grain amaranth

Integrated nutrient management studies were conducted at S.K. Nagar with a view to find out a desirable combination of organic and inorganic fertilizers for grain amaranth. Fifteen treatments were replicated four times in Randomized Block Design.

The highest grain yield of amaranth was obtained (Table 142) when 75% N was applied through chemical fertilizer and 25% through FYM and was supplemented with 40 kg P_2O_5/ha (T_5). This treatment was at par with all the combinations of organic and inorganic manurial applications where which were supplemented with 40 kg P_2O_5/ha. These treatments (T_5, T_7, T_9, T_{11}, T_{13}, T_{15}) were superior to all those treatments where P_2O_5 had not been applied (T_4, T_6, T_8, T_{10}, $T_{12,}$ T_{14}). A similar trend was observed in case of inflorescence length.

Experiment 3: Effect of sowing time and spacing on grain amaranth

Grain amaranth cv. Annapurna was sown on two dates, namely, 10th November (D_1 – Normal) and 25th November (D_2 – late) with two spacings viz. 22.5x10 cm (S_1) and 45x10 cm (S_2) and two doses of fertilizer (75% RDF – F_1 and 100% RDF – F_2) so as to standardise its agronomy for late sown conditions at S.K. Nagar.

Data given in table 143 indicated that there were no differences in grain yield of amaranth between the two dates/sowing. On the other hand, sowing amaranth in 22.5x10 cm spacing (S_1) resulted in higher yield of than that obtained under 45x10 cm spacing (S_2). Similarly, application of recommended dose of fertilizer (F_2) led to higher yield of grain amaranth in comparison with the yield obtained by applying 75% of the recommended dose (F_1). The difference between the two manurial treatments appeared to be more pronounced under narrower (S_1) than wider (S_2) row spacing.

Experiment 4: Evaluation of organic sources for nitrogen management in grain amaranth

To standardize the dose of vermi-compost or a combination of other organic manures for organic farming for grain amaranth in Garhwal hills, the crop of grain amaranth (cv. PRA-3) was given fifteen manurial treatments in Randomized Block Design in three replications at Ranichauri (Table 144).

Amaranth crop fertilized with RDF ($N_{60}P_{40}$ kg/ha) resulted in significantly higher grain yield followed by chullucake @2.5 and 7.5 t/ha, Vermicompost @2.5 t/ha + FYM @4.0 t/ha, FYM @ 8.0 t/ha and FYM @ 4.0 t/ha + Azotobacter which were at par with each other and showed significant superiority over other treatments and control. Treatment Vermicompost @ 2.0 t/ha + chullucake @2.5 t/ha, chullucake @2.5 t/ha + FYM @ 4.0 t/ha followed by chullucake @ 2.5 t/ha + Azotobactor showed significant superiority over control and vermicompost @2.5 t/ha + Azotobactor. Treatment vermicompost @2.5 t/ha + Azotobactor did not show any significant effect over control.

Experiment 5: Popularisation of amaranth in the farmer's fields in non-conventional areas

Five farmers were selected in Kolar, Tumhar and Bangalore (rural) districts for raising grain amaranth cv. Suvarna in their fields. Crop is yet to be harvested.

5.2 BUCKWHEAT (*Fagopyrum esculentum, F. tataricum*)

Experiment 6: Response of promising buckwheat genotypes to fertilizer doses

Four promising genotypes of buckwheat were administered three doses of fertilizer at Ranichauri in order to work out fertilizer requirement of buckwheat genotypes in the pipe line. The experiment was laid out in Factorial RBD with three replications.

Data presented in table 145 revealed that buckwheat genotypes fertilized with $N_{40}P_{40}K_{20}$ kg/ha gave significantly higher grain yield (15.0 q/ha) than that of farmers practice ($N_{15}P_{15}K_{15}$) and RDF ($N_{40}P_{40}$ kg/ha). The data showed that

application of 20 kg K increased the grain yield. Among the genotypes 'Himpriya' produced significantly higher grain yield over others.

Interaction effect of fertilizer doses and genotypes recorded significant yield indicating that genotypes required different fertilizer doses.

Experiment 7: Integrated nutrient management studies in buckwheat

With a view to standardize the dose of vermicompost or a combination of other organic manures for organic farming of buckwheat in Garhwal hills, buckwheat (cv. PRB-1) was subjected to fifteen organic manurial treatments at Ranichauri. The desisgn followed was RBD with three replications.

Data on yield of buckwheat (Table 146) indicated that application of FYM @4.0 t/ha + Azotobactor produced significantly higher yield followed by chullucake @2.5 t/ha + Azotobactor and RDF ($N_{60}P_{40}$ kg/ha) which were at par with each other and showed significant superiority over other treatments and control. Vermicompost @2.5 t/ha and chullucake applied @7.5 t/ha which were at par with each other gave higher grain yield over vermicompost @2.5 t/ha + Azotobactor and chullucake @5.0 t/ha followed by chullucake @2.5 t/ha, vermicompost @5.0 t/ha and other treatments and control.

5.3 RICE BEAN (*Vigna umbellatta*)

Experiment 8: Performance of rice bean in comparison with prevailing pulse crops

Performance of rice bean for pulse/fodder production was compared with blackgram, green gram and cowpea at Mettupalayam, Bangalore, Bhubaneswar and Hisar in order to seed scope of introducing this crop in these areas.

Rice bean was observed to yield more for seed as well as fodder than black gram and green gram at Bangalore and Bhubaneswar centres (Table 147) which indicates its suitability and possible introduction in Orissa and Karnataka states.

Experiment 9 : Performance of rice bean based crop rotations under varying fertility conditions

Rice bean was grown in rotation with wheat, mustard, barley, berseem, oats and gram at Hisar to find out suitable crop rotation for rice bean in Haryana and to work out its fertilizer requirements under different crop rotations.

Data on rice bean yield is given in table 148. However, inferences will be drawn after receiving data on rabi season crops.

Experiment 10 : Integrated nutrient management studies in rice bean

In order to standardize the dose of organic manures for rice bean, 12 manurial treatments were given to the crop of rice bean at Hisar. Data on seed yield (Table 149) of rice bean indicated that the highest yield of rice bean was obtained by applying the recommended fertilizer dose alone or in combination of RFD with other treatments. However, other manurial treatments led to increase in yield of rice bean over control.

Experiment 11: Effect of spacing, nutrients and pruning in *Jatropha*

To work out spatial and fertilizer requirement of *Jatropha*, the crop was planted in 1x1 m (S_1), 1.5x1.5 m (S_2), 2x2 m (S_3) and 3x2 m (S_4) spacings at Mettupalayam and administered four doses of fertilizer, viz. $N_0P_0K_0$ (F_1), $N_{15}P_{10}K_{10}$ (F_2), $N_{30}P_{20}K_{20}$ (F_3) and $N_{45}P_{30}K_{30}$ (F_4) in split plot design with three replications. Plant height and number of branches per plant were reported to increase with spacing, fertilizer dose and age (Table 150).

Table 140. Centre-wise details of agronomic experiments conducted on underutilized crops during 2006

S.No.	Experiment	Mettupalayam	Bangalore	Bhubaneswar	S.K. Nagar	Hisar	Ranichauri	Palampur/ Sangla	Ludhiana
1.	Effect of spacing and fertilizer levels on grain amaranth genotypes	-	Y	Y	Y	-	-	-	-
2.	Integrated nutrient management studies in grain amaranth	-	-	-	Y	N	-	-	-
3.	Effect of sowing time and spacing on grain amaranth	-	-	-	Y	-	-	-	-
4.	Evaluation of organic sources for N-management in grain amaranth	N	-	N	-	-	Y	N	-
5.	Popularization of amaranth in the farmer's fields in non-conventional areas	N	Y	N	N	-	-	N	-
6.	Response of promising buckwheat genotypes to fertilizer doses	-	-	-	-	-	Y	N	-
7.	Integrated nutrient management studies in buckwheat	-	-	-	-	-	Y	-	-
8.	Performance of rice bean in comparison with prevailing pulse crops	Y	Y	Y	-	Y	N	N	N
9.	Performance of rice bean based crop rotations under varying fertility conditions	-	-	-	-	Y	-	-	-
10.	Optimization of sowing time in rice bean	-	N	N	-	-	-	-	-
11.	Integrated nutrient management studies in rice bean	-	-	-	-	Y	-	-	-
12.	Effect of spacing, nutrients and pruning in *Jatropha*	Y	-	-	N	-	-	-	-
13.	Response of promising genotypes of karingada to N-doses	-	-	-	N	-	-	-	-
	Total	**2(4)**	**4(4)**	**3(5)**	**3(6)**	**3(4)**	**3(4)**	**0(4)**	**0(1)**

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

Table 141. Effect of spacing and fertilizer doses on grain yield (kg/ha) of amaranth genotypes

S.No.	Treatment	Bangalore	Bhubaneswar	S.K. Nagar
1.	$V_1F_1S_1$	362	1423	1544
2.	$V_1F_1S_2$	479	1309	1481
3.	$V_1F_2S_1$	302	1286	1322
4.	$V_1F_2S_2$	462	1209	1260
5.	$V_2F_1S_1$	274	1276	1450
6.	$V_2F_1S_2$	398	1136	1414
7.	$V_2F_2S_1$	265	1157	1322
8.	$V_2F_2S_2$	375	1069	1427
9.	$V_3F_1S_1$	289	1236	1746
10.	$V_3F_1S_2$	393	1127	1614
11.	$V_3F_2S_1$	231	1141	1620
12.	$V_3F_2S_2$	362	1053	1527
13.	$V_4F_1S_1$	413	1310	1413
14.	$V_4F_1S_2$	503	1209	1429
15.	$V_4F_2S_1$	333	1202	1435
16.	$V_4F_2S_2$	449	1111	1422
17.	$V_5F_1S_1$	212	1094	1188
18.	$V_5F_1S_2$	290	954	970
19.	$V_5F_2S_1$	196	1029	1060
20.	$V_5F_2S_2$	249	895	904
C.D. (0.05)		**57.3**	**88.3**	**146.6**
CV (%)		**10.1**	**-**	**12.8**

V_1 : BGA-2
V_2 : GA-1
V_3 : GA-2
V_4 : Suvarna
V_5 : Annapurna

F_1 : Recommended dose of fertilizer (RDF)
F_2 : 75% of RDF
S_1 : 30 cm x 15 cm
S_2 : 45 cm x 15 cm

Table 142. Integrated nutrient management studies in grain amaranth

Treatment No.	Treatment combinations	Grain yield (kg/ha)	Days to 50% flowering	Days to maturity	Plant height (cm)	Inflorescence length (cm)
T_1	100% RDF	144.44	49.00	105.00	150.50	42.25
T_2	100% N through FYM	1080.24	51.00	104.00	151.00	46.00
T_3	100% N through castor cake	917.28	48.00	107.00	153.75	47.50
T_4	75% N RDF + 25% N through FYM	1186.72	47.50	108.00	147.25	47.50
T_5	75% N RDF + 25% N through FYM + 40 kg P_2O_5	1533.94	45.25	104.50	146.00	47.75
T_6	75% N RDF + 25% N through castor cake	1024.99	46.00	106.00	140.75	44.50
T_7	75% N RDF + 25% N through castor cake + 40 kg P_2O_5	1469.13	51.00	103.00	151.25	45.25
T_8	50% N RDF + 50% N through FYM	1135.80	49.00	102.00	152.00	43.50
T_9	50% N RDF + 50% N through FYM + 40 kg P_2O_5	1246.921	46.00	105.00	152.75	50.25
T_{10}	50% N RDF + 50% N through castor cake	1234.56	48.00	106.00	156.50	49.50
T_{11}	50% N RDF + 50% N through castor cake + 40 kg P_2O_5	1493.82	54.00	104.00	157.75	48.50
T_{12}	25% N RDF + 75% N through FYM	1138.88	53.00	99.25	155.00	44.50
T_{13}	25% N RDF + 75% N through FYM + 40 kg P_2O_5	1404.31	48.25	101.00	157.25	55.00
T_{14}	25% N RDF + 75% N through castor cake	1182.09	51.00	104.75	151.25	51.00
T_{15}	25% N RDF + 75% N through castor cake + 40 kg P_2O_5	1512.34	53.50	107.50	163.50	60.00
Mean		**1267.03**	**49.37**	**104.47**	**152.40**	**48.20**
CD (0.05)		**290.04**	**2.93**	**2.51**	**-**	**8.76**
CV (%) Error		**16.03**	**4.15**	**1.69**	**7.70**	**12.72**

Table 143. Effect of time of sowing and spacing on growth and yield of grain amaranth cv. Annapurna

Treatment	Grain yield (kg/ha)	Days to 50% flowering	Days to maturity	Plant height (cm)	Inflorescence length (cm)	Stand at maturity (plants/plot)
$D_1S_1F_1$	1106.48	36.50	76.50	72.50	37.25	324.75
$D_1S_1F_2$	1196.76	35.75	76.00	76.25	38.75	335.00
$D_1S_2F_1$	924.77	33.00	75.00	70.25	37.00	187.540
$D_1S_2F_2$	971.06	36.75	74.50	79.00	41.25	205.00
$D_2S_1F_1$	1030.09	37.00	75.75	72.00	40.00	321.75
$D_2S_1F_2$	1365.74	36.50	74.00	74.00	40.25	343.50
$D_2S_2F_1$	881.94	36.00	74.75	76.00	42.50	192.50
$D_2S_2F_2$	891.20	35.00	77.50	76.75	40.50	196.25
GA-1 (C)	1428.24	55.50	112.35	178.00	103.00	127.75
GA-2 (C)	1570.60	51.25	100.75	176.50	98.25	123.75
Mean	**1136.69**	**39.33**	**81.71**	**95.13**	**51.88**	**235.78**
CD (0.05)						
CV (%) Error						

Table 144. Influence of organic sources of nitrogen on growth and yield of grain amaranth

S. No.	Treatments	No. of fingers/ inflorescence	Plant pop/ha (000)	Grain yield (q/ha)	Straw yield (q/ha)
1.	Control	48.90	165.00	6.91	33.52
2.	Vermicompost @2.5 t/ha	61.16	210.00	10.17	38.55
3.	Vermicompost @5.0 t/ha	62.80	206.70	9.95	38.84
4.	Vermicompost @7.0 t/ha	103.60	186.70	8.76	39.19
5.	Chullucake @2.5 t/ha	66.60	216.70	13.85	48.10
6.	Chullucake @5.0 t/ha	60.50	140.00	9.87	36.71
7.	Chullucake @7.5 t/ha	55.09	180.00	13.83	47.34
8.	FYM @8.0 t/ha	66.10	183.30	13.53	44.26
9.	Vermicompost @2.5 t/ha + FYM @4.0 t/ha	83.30	206.70	13.83	39.04
10.	Chullucake @2.5 t/ha + FYM @4.0 t/ha	71.30	210.00	11.15	43.12
11.	Vermicompost @2.5 t/ha + Chullucake @2.5 t/ha	77.90	193.30	11.40	43.07
12.	FYM @4.0 t/ha + Azotobactor	90.90	200.00	13.13	45.46
13.	Vermicompost @2.5 t/ha + Azotobactor	52.70	253.30	8.67	24.26
14.	Chullucake @2.5 t/ha + Azotobactor	62.33	183.30	9.09	35.89
15.	RDF ($N_{60}P_{40}$ kg/ha)	58.50	233.30	14.18	41.55
	CD (0.05)	**11.45**	**43.07**	**2.15**	**6.21**
	CV (%) Error	**10.05**	**13.01**	**11.45**	**9.30**

Table 145. Effect of N doses on grain yield (q/ha) of different genotypes

Treatments	**Genotypes**				
	Sangla B_1	**Sangla B_5**	**Shimla B_1**	**Himpriya**	**Mean**
N levels					
$N_{15}P_{15}K_{15}$	9.9	12.9	9.2	14.2	**11.6**
$N_{40}P_{40}$ (RDF)	11.1	11.7	13.6	11.4	**12.0**
$N_{40}P_{40}K_{40}$	16.7	14.5	10.2	18.5	**15.0**
Mean	**12.6**	**13.0**	**11.0**	**14.7**	
CD (0.05)					
N	1.2				
V	1.4				
N x V	2.4				
CV (%)	**10.9**				

Table 146. Effect of integrated nutrient management on growth and yield of buckwheat

S. No.	Treatments	Plant height at 25 DAS (cm)	Plant pop (1000/ha)	Grain yield (q/ha)	Straw yield (q/ha)
1.	Control	179.2	52.3	5.94	30.13
2.	Vermicompost @2.5 t/ha	135.4	54.5	9.54	53.42
3.	Vermicompost @5.0 t/ha	160.2	36.5	7.40	41.44
4.	Vermicompost @7.0 t/ha	149.1	62.5	5.77	32.31
5.	Chullucake @2.5 t/ha	169.0	54.6	7.75	43.40
6.	Chullucake @5.0 t/ha	130.8	51.7	7.80	45.01
7.	Chullucake @7.5 t/ha	127.1	42.7	9.10	50.96
8.	FYM @8.0 t/ha	122.6	43.3	5.21	28.78
9.	Vermicompost @2.5 t/ha + FYM @4.0 t/ha	144.9	53.7	5.38	29.17
10.	Chullucake @2.5 t/ha + FYM @4.0 t/ha	174.2	32.6	6.17	34.55
11.	Vermicompost @2.5 t/ha + Chullucake @2.5 t/ha	114.3	27.4	6.29	35.22
12.	FYM @4.0 t/ha + Azotobactor	130.9	58.5	11.72	65.63
13.	Vermicompost @2.5 t/ha + Azotobactor	137.1	52.7	8.39	47.00
14.	Chullucake @2.5 t/ha + Azotobactor	137.9	65.8	11.39	63.78
15.	RDF ($N_{60}P_{40}$ kg/ha)	158.0	67.6	11.10	62.16
	CD (0.05)	**11.20**	**5.87**	**1.95**	**4.52**
	CV (%) Error	**4.62**	**6.98**	**14.81**	**6.11**

Table 147. Performance of rice bean in comparison with prevailing pulse crops for seed/fodder production (q/ha)

S. No.	Treatment	Mettupalayam		Bangalore		Bhubaneswar*		Hisar	
		Seed	Fodder	Seed	Fodder	Seed	Fodder	Seed	Fodder
1.	Rice bean (RBL-1)	1.40	-	3.25	33.30	12.54	13.81	8.41	-
2.	Rice bean (RBL-6)	0.90	-	3.45	29.30	-	-	7.67	-
3.	Black gram	6.20	-	2.67	18.30	9.84	11.95	10.11	-
4.	Green gram	2.01	-	3.42	22.80	7.12	10.05	12.00	-
5.	Cowpea	-	8.40	5.11	41.00	11.43	18.71	7.99	11.71
	CD (0.05)	**0.82**	**-**	**0.65**	**0.49**	**1.44**	**-**	**-**	-
	CV (%)	**30.52**	**-**	**12.70**	**12.70**	**-**	**-**	**-**	**-**

* Rice bean equivalent yield

Table 148. Effect of different crop rotations and fertilizer doses on seed yield (q/ha) of rice bean

Crop rotations	Fertilizer dose (kg/ha)	Seed yield (q/ha)
Rice bean - Wheat	N_0P_0	7.93
	$N_{20}P_{20}$	8.03
	$N_{20}P_{40}$	8.13
Rice bean – Barley	N_0P_0	7.90
	$N_{20}P_{20}$	8.00
	$N_{20}P_{40}$	8.10
Rice bean – Oats	N_0P_0	8.03
	$N_{20}P_{20}$	8.13
	$N_{20}P_{40}$	8.17
Rice bean – Berseem	N_0P_0	8.01
	$N_{20}P_{20}$	7.92
	$N_{20}P_{40}$	7.96
Rice bean – Gram	N_0P_0	7.67
	$N_{20}P_{20}$	8.07
	$N_{20}P_{40}$	8.27
Rice bean – Mustard	N_0P_0	7.27
	$N_{20}P_{20}$	8.05
	$N_{20}P_{40}$	8.05

Table 149. Effect of different nutrient management treatments on seed yield (q/ha) of rice bean

S.No.	Treatments	Seed yield (q/ha)
1.	Control	9.61
2.	Recommended dose of fertilizer – N_{20} + P_{40} (RDF)	19.99
3.	Phpsphorus solublizing bacteria (PSB)	12.15
4.	Rhizobium culture	14.28
5.	50% RDF + PSB	14.93
6.	50% RDF + Rhizobium	15.47
7.	100% RDF + PSB	16.23
8.	100% RDF + Rhizobium	16.87
9.	PSB + Rhizobium	16.66
10.	50% RDF + PSB + Rhizobium	17.09
11.	75% RDF + PSB + Rhizobium	17.73
12.	100% RDF + PSB + Rhizobium	19.03

Table 150. Effect of different spacings and fertilizer doses on growth of *Jatropha curcas*

S. No.	Treatment	Branches/plant		Plant height (cm)	
		08.09.06	**03.01.07**	**08.09.06**	**03.01.07**
1.	S_1F_1	8.8	10.0	123.0	127.0
2.	S_1F_2	10.7	11.8	127.0	135.0
3.	S_1F_3	10.8	11.7	128.0	130.0
4.	S_1F_4	10.7	11.8	132.0	137.0
5.	S_2F_1	9.2	10.6	102.0	98.0
6.	S_2F_2	10.4	10.7	98.0	109.0
7.	S_2F_3	11.1	12.0	113.0	114.0
8.	S_2F_4	11.7	12.5	125.0	127.0
9.	S_3F_1	6.8	8.2	90.0	86.0
10.	S_3F_2	8.2	8.9	83.0	95.0
11.	S_3F_3	9.6	10.8	108.0	110.0
12.	S_3F_4	12.1	13.4	110.0	110.0
13.	S_4F_1	12.1	13.1	119.0	123.0
14.	S_4F_2	12.7	13.9	124.0	128.0
15.	S_4F_3	10.6	11.7	104.0	107.0
16.	S_4F_4	10.3	11.4	109.0	113.0
	Mean	**9.8**	**11.4**	**112.5**	**115.8**
	CD (0.05)	**6.54**	**4.74**	**39.3**	**37.40**
	CV (%)	**40.0**	**24.9**	**20.9**	**19.55**

CENTRE REPORT

VI. CENTRE REPORT

6.1 HILLS

6.1.1 GBPUAT, Ranichauri

Grain Amaranth:

F_1 generation evaluation: Twelve crosses were evaluated in their F_1 generation along with parents. Ten plants per cross were observed for various characters. Seed yield of the crosses varied from 36.45 to 72.75 g/plant. Flowering time (76-94 days) and maturity (158-176 days) had less variation. Great extent of variation (20.00 - 54.50 cm) for panicle length was also observed in the crosses.

F_2 generation evaluation: Sixteen crosses were evaluated in their F_2 generation along with parents. Four plants per cross were observed for various characters. One plant from the cross *Annapurna x Sangla* A-5 produced the highest seed yield (46.50 g/plant) as compared to all the parents. One plant from the cross PRA-2004 x RMA-8 produced the longest inflorescence 56.85 cm which is better than all the parents.

F_4 line testing: Superior F_4 lines of nine crosses were tested for seed yield and its related attributes. Eight plants per cross were observed. Seed yield of the lines ranged from 130.72 - 215.45 g/plot. Flowering time ranged from 48.0 – 86.0 days.

F_5 yield testing: Eleven F_5 lines were tested in RBD for seed yield and its related important characters. Considerable variation was observed for seed yield and inflorescence length. No line was found superior to the check variety PRA-2 for seed yield whereas longest inflorescence was observed with the line VL-44 x PRA8901 (64.80 cm) followed by PRA8901 x VL-44 (60.25 cm).

F_6 yield testing: Superior lines were tested for seed yield, flowering, maturity, inflorescence length and number of fingers. Seed yield ranged from 12.49 – 22.49 q/ha. The highest seed yield 22.49 q/ha was observed with line PLP-1 x Annapurna followed by Annapurna x PLP-1 (22.33 q/ha). Longest inflorescence (63.80 cm) was produced by the line VL-44 x PRA-1.

A set of 226 germplasm lines collected from Garhwal hills were evaluated in Augmented Block Design, the same deposited in the Gene Bank and 11 introduced vegetable amaranth lines from Taiwan were also evaluated.

Station line trial I & II: Two station line trials were conducted with 12 and 11 lines respectively for six important characters. In trial I the seed yield ranged from 18.33 – 34.16 q/ha and in trial II, it ranged from 20.49 – 39.16 q/ha. The line PRA 9301 x VL-33 was observed as top yielder with seed yield of 39.16 q/ha.

Rice bean:

F_1 generation: A total of 36 crosses were evaluated along with their parents. Seed yield of the crosses varied from 25.00 – 52.65 g/plant. Flowering time (63.0 – 89.0 days) and maturity period (140 – 178 days) showed wide variation as compared to the parental checks.

F_2 generation: F_2 generation of 23 crosses was evaluated along with the check variety for seed yield and its related characters. Seed yield per plant ranged from 34.50 – 64.62 g and flowering time varied from 70 – 89 days.

F_3 line evaluation: Sixty F_3 lines of 30 crosses were evaluated in two row plots (size 3x1.2 m). Seed yield of the lines ranged from 85.0 – 480.0 g/plot and flowering time ranged from 62 – 82 days.

F_4 line evaluation: A total of 36 lines from 12 crosses were evaluated for seed yield and its related important characters along with parental checks. The plot size was 3x0.60 m. Seed yield per plot ranged from 85.95 – 275.00 g which was lower than parental checks and flowering time ranged from 67 – 90 days.

F_5 line evaluation: 32 lines of 18 crosses were evaluated along with two check varieties PRR-1 and PRR-2. Seed yield per plot ranged from 48.62 – 350.85 g, whereas flowering and maturity period ranged from 67 – 90 days and 150 – 172 days, respectively.

F_6 generation of narrow leaf plant and early maturity lines: Narrow leaf and early maturing plants selected in F_2 generation were evaluated for six important characters in progeny rows. Seed yield per plot ranged from 65.85 –

365.75 g. Flowering time varied from 34 – 59 days and maturity period from 96 – 112 days.

F_6 yield trial: Selected superior lines were tested in a replicated trial along with two checks PRR-1 and PRR-2. Seed yield of the lines ranged from 7.22 – 31.94 q/ha and flowering period ranged from 62 – 85 days.

Hybridization programme: New hybridization programme was undertaken to produce 15 single crosses.

Station trial I, II & III: Three station trials (I, II, III) were conducted with 10, 13 and 15 lines respectively in RBD for seed yield and related characters. Shortest flowering time (45 days) was observed in trial I while maximum flowering time was observed in trial III (75 days) with the line PRR9301 x PRR-1.

RAPD Analysis of parents and narrow leaf crosses: Twenty four parents and their hybrids were characterized through morphological, chemical, physiological and molecular (RAPD) markers. Out of 30 primers used 17 were found effective in classifying the crosses and parents correctly.

Buckwheat:

Characterization of varieties through isozyme markers: Twelve buckwheat varieties were characterized using morphological, physiological and biochemical (isozyme) markers. It was observed that isozyme markers in combination with morphological markers were efficient in unambiguous identification of varieties.

6.2 PLAINS

6.2.1 CCS HAU, Hisar

Hybridization programme in faba bean was carried out and a total of 32 crosses were made. The parents were HB-180, HB-204, Vikrant, HB-430, EC 329675, PRT-7, PRT-12, EC 248710, EC 117755 and EC 11 7799 selected for different characters.

6.2.2 UAS, Bangalore:

Mutation in Winged bean: In winged bean four genotypes Mysore local, AKWB-1, Dwarf mutant and NBRI-Selection were irradiated with four doses – 10 kr, 15 kr, 20 kr and 25 kr at BARC, Trombay. M_1 generation was raised during kharif 2005 and advanced to M_2 generation during kharif 2006.

Hybridization in Rice bean: A total of 32 crosses were evaluated. The seed yield observed was very low.

Hybridization in Grain Amaranth: In grain amaranth ten crosses were evaluated for yield and its related characters. The highest seed yield was produced by cross Suvarna x RGAS-92-10-1 (105 g/plant) followed by Suvarna x IC-32195 (85 g/plant).

6.2.3 NDUAT, Faizabad:

Hybridization in Faba bean: Twelve crosses were evaluated for seed yield and related characters. The parents used in the programme were HB-416, HB-303, BSH-42, BH-418, HB-420, HB-430, Vikrant and NDF-1. The F_1 generation will be grown in Rabi 2006-07.

6.2.4 OUAT, Bhubaneswar:

F_1 generation evaluation in rice bean: Fifteen F_1 liens were evaluated for important seed yield characters along with their parents. The seeds were harvested to evaluate the F_2 generation during kharif 2007.

Mutation breeding on rice bean – M_3 generation: A total of eleven genotypes were treated with 40 kR gamma rays during kharif 2004 and the M_1 was grown in the same season. M_2 generation was evaluated during kharif 2005 and 175 individuals plants were selected on the basis of seed yield and its related characters. During kharif 2006 individual plants were evaluated in M_3 generation in replicated trial for seed yield and related characters.

SUMMARY

VII. SUMMARY

A total of 190 experiments were allotted during 2006 including germplasm evaluation (63), breeding (87), agronomic (32) and quality (8) of underutilized crops at twenty two locations in different agro-climatic zones of the country. Out of these, 127 trials were carried out. A summary of research achievements is given below:

7.1 Plant breeding

Eighty seven varietal trials, 31 in hills and 56 in plains, were conducted on fourteen 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 151.

Table 151. Best genotypes in different trials conducted at multilocations during 2006

Crop		Entries	Locations	Top yielder	Yield (q/ha)
HILLS					
Amaranth	IVT	19	5	IC35407	28.35
	AVT-I	1	5	IC35407	28.35
Buckwheat	IVT	13	3	IC261963	13.29
	AVT-I	3	3	VL-7 (C)	8.63
	AVT-II	1	3	VL-7 (C)	8.63
Chenopodium	IVT	11	3	IC107299	16.22
	AVT-I	4	3	SMLCP-2	16.15
Rice bean	IVT	11	5	LRB022	12.07
	AVT-I	1	5	PRA-2 (C)	10.17
Adzuki bean	IVT	15	3	HPU-51 (C)	12.36
	AVT-I	1	3	HPU-51 (C)	12.36
	AVT-II	5	3	HPU-51 (C)	12.36
Faba bean Grain type	IVT	6	1	HB 611	1.14
Faba bean Vegetable type	IVT	6	1	HB 611	5.25(Pod yield)
Job's tear	IVT	18	3	AAH-33	6.25
Perilla	IVT	14	1	BDS-1644	15.26
PLAINS					
Amaranth Rabi 2005-06	IVT	8	6	SKNA 503	13.89
Amaranth Kharif 2006	AVT-I	5	1	SKNA 601	8.13
Rice bean	IVT	20	8	LRB 334	10.18

Faba bean	IVT	8	5	HB 608	19.25
Winged bean	IVT	11	1	EC116887	9.79
	AVT -I	9	3	EC142665	11.92
Kallingda	IVT	17	1	SKNK 679	906.67(g)/plant
Kankoda	AVT-I	9	5	RMF-37(C)	13.50
Tumba	IVT	14	1	RMT 407	1.76
Jatropha	IVT	8	4	JH 1	10.28

Based on the three years data, the best genotype in each crop with respect to yield has been identified and indicated in Table 152. 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 152. List of promising genotypes based on three years data

Crop	Genotype	Average seed yield (q/ha)	Increase/decrease over check (%)	
			First check	Second check
HILLS				
Buck wheat	Himpriya (C)	13.58	-	-
Adzukibean	SMLAB-6	15.26	8.15	-

7.2 Germplasm evaluation

Over 2164 accessions, some of them tested at more than one location, were evaluated at twenty five locations during 2006. Crop-wise number of accessions, locations and promising accessions have been given in table 153.

Table 153. Performance of germplasm accessions in different crops

Crops	No. of accessions	Location	Check	Best accession (Yield g/plant)	Best accession (Days to maturity)
HILLS					
Amaranth	50	Ranichauri	PRA-1 PRA-2 Annapurna Durga	IC467912 (75.18), IC467901 (72.05)	IC467886 (100.0), EC519562 (101.0)
	50	Palampur	Durga Annapurna PRA-2 PRA-3	-	IC447676 (83.0), IC447682 (83.0)
	50	Shimla	PRA-1 PRA-2 Annapurna Durga	IC467910 (107.53), IC540862 (105.11)	-

		Based on 3 locations	-	IC540839 (84.55), IC540860 (84.55)	-
Buckwheat	50	Almora	Himpriya PRB-1 Shimla B-1 VL ugal 7	IC108499 (11.20), IC107989 (10.64)	-
	50	Shimla	Himpriya PRB-1 Shimla B-1 VL ugal 7	-	-
	50	Ranichauri	Himpriya PRB-1 Shimla B-1 VL ugal 7	-	-
		Based on 3 locations	-	EC125938 (40.00)	-
Chenopodium	25	Shimla	EC507741 NIC022503 PRC 9801	NIC22506 (51.94), EC507733 (46.30)	-
	25	Ranichauri	EC507741 NIC022503 PRC 9801	IC258332 (30.68), IC341707 (30.60)	IC415493 (90.00), EC507733 (95.00)
		Based on 2 locations		NIC022506 (36.22), EC507733 (30.70)	EC507733 (120.00), IC415493 (121.00)
Adzuki bean	25	Shimla	HPU-51	EC087895 (32.01)	EC240254 (103.00), IC341949 (104.00_
	25	Ranichauri	HPU51	IC341952 (42.50), EC340267 (41.84)	IC341949 (112.00), EC000248 (114.00)
		Based on 2 locations		EC340244 (33.71), IC341952 (33.41)	EC341961 (109.50), EC281186 (109.50)
Perilla	19	Ranichauri	SHILLONG	SS359 (109.43), SS570 (99.15)	SS491 (165.00), SSAKM122 (166.00)
	19	Bhowali	SHILLONG	IC066440 (10.0), H-529 (8.6)	-
		Based on 2 locations		-	SS539 (160.00), SSAKM 88 (162.00)
PLAINS					
Amaranth (Kharif 2006)	50	Bangalore	Annapurna GA-1 GA-2 Suvarna	-	-
	50	Mettupalayam	Annapurna GA-1 GA-2 Suvarna	-	-
		Based on 2 locations		-	-
Amaranth (Rabi 2005-06)	50	Faizabad	Annapurna GA-1 GA-2	IC415282 (19.0), EC519527 (18.0)	IC421885 (84.00), IC415466 (85.00)
	105	Bhubaneswar	Annapurna GA-1 GA-2 Suvarna	BGA15 (22.4), BGA 10 (22.0)	IC415318 (77.00), IC415330 (77.00)
	50	Mador	Annapurna GA-1 GA-2 Suvarna	-	IC415297 (106.000, IC415320 (107.00)

		Based on 3 locations		-	IC415297 (90.33), IC415254 (91.00)
Rice bean	100	Ludhiana	RBL 06 RBL-35 RBL-50	LRB273 (30.00), LRB272 (23.00)	LRB266 (105.00), LRB263 (105)
	100	Bhubaneswar	RBL 01 RBL-06 RBL-35 RBL-50	BRB 20 (15.70), BRB 22 (15.43)	BRB 5 (84.00), BRB 6 (84.00)
	100	Bangalore	RBL 01 RBL-06 RBL-35 RBL-50	LRB-233 (3.06)	-
	100	Rahuri	RBL 01 RBL-06 RBL-35 RBL-50	LRB-162 (3.20), LRB-139 (3.20)	LRB-196 (84.00), LRB-248 (84.00)
	100	New Delhi	RBL 06 RBL-35 RBL-50	LRB-157 (33.5), LRB-241(33.0)	LRB-119 (113.0), LRB-279 (113.0)
	100	Ranchi	RBL 01 RBL-06 RBL-35 RBL-50	LRB 168 (8.6), LRB 123 (8.3)	LRB 248 (98.00), LRB 263 (98.00)
	100	S.K. Nagar	RBL 01 RBL-06 RBL-35 RBL-50	-	-
		Based on 7 locations		LRB-241 (13.23), LRB-189 (11.47)	LRB-187 (84.3)
Faba bean	235	Hisar	PRT-7 PRT-12 Vikrant	IC366272 (300.0), HB070 (260.1)	Multant-2 (145.3), IC331549 (156.0)
	142	Delhi	PRT-7 PRT-12 Vikrant	EC243756 (100.00), EC243770 (40.00)	VKG29/64 (150.00), IC361499 (150.00)
	110	Faizabad	PRT-7 PRT-12 Vikrant	-	EC329715 (153.00), EC243772 (154.00)
Kalingada	45	S.K. Nagar	-	-	-
Jatropha	13	Hisar	-	JH-7 (250.00), JH-1 (216.00)	-
	22	CSSRI, Karnal	-	Cutting (58.20) TNMC-22 (19.13)	-
Kankoda	90	Rahuri	-	-	-
Simaruba	64	Rahuri	-	-	-

7.3 Quality

The seeds of promising genotypes evaluated in IVT, AVT and germplasm evaluation of the four underutilized crops from five locations were planed for quality analysis but due to non- availability of seed from the centers, quality analysis was done only in five underutilized crops supplied by the four centres. The crop-wise details of best genotypes are given in the table below :

Crops	Best genotypes
Rice bean (AVT), Bangalore	Protein (LRB-330 : 21.3%, LRB-303 :21.2%) Tryptophan (PRR-2:0.94%, PRR-9302: 0.91%) Methionine (PRR-2:0.98%, LRB-234: 0.93%) Free phenol (PRR-9402:0.24%, LRB-351: 0.23%)
Rice bean (AVT), Ranichauri	Protein (RBL-1:21.8%, LRB-463:21.7%) Tryptophan (LRB-005:0.91%, Totru(Local) :0.89%) Methionine (RBB-3-016:0.98%, LRB-005 : 0.97%) Free phenol (RB-3-016:0.23%, LRB-005 : 0.22%)
Buck wheat (AVT), Sangla	Protein (IC-323724: 11.7%, IC-382287: 11.5%) Free phenol (SMLBW-4: 0.94%, IC-329456: 0.92%) Lysine (SLMBW-3: 5.6 g/16gN, IC-310095: 5.5 g/16gN)
Buck wheat (AVT), Ranichauri	Protein (SMLBW-4: 13.4%, IC-382287: 13.0%) Free phenol (SMLBW-4: 0.75%, IC-329456: 0.74%) Lysine (IC-274438 :5.2 g/16gN, EC-272442: 5.2 g/16gN)
Based on two locations	Protein (VL-7 (C): 13.55%, PRB-1: 12.40%) Free phenol (SMLBW-4: 0.85%, IC-329456: 0.83%) Lysine (SMLBW-3: 5.40%, IC-272442: 5.20%)
Grain Amaranth (AVT), Ranichauri	Protein (LPKB-504-55: 14.2%, VL 0344: 14.1%) Lysine (PRA 2005-1: 5.5 g/16gN, PRA-2005-2 : 5.3 g/16gN)
Jatropha (S.K. Nagar)	Oil content (Chhatrapati : 57.7%, SKN (Big) : 56.2%)

Based on 3 years performance the genotypes with best quality traits were mentioned in table 154.

Table 154. List of genotypes with better quality based on 3 years data

Crop	Quality parameters	Promising genotypes
Amaranth	Protein (%)	BGA-2 (13.57), GA-1 (13.23), BGA-3 (12.97), Suvarna (12.57)
	Lysine (%)	SKNA-21 (5.33), Suvarna (5.23)
Faba bean	Protein (%)	HB-430 (25.50), HB-180 (25.37), Vikrant (25.20)
	Vicine-convicine (%)	HB-131 (0.90), PRT-7 (0.92), HB-428 (0.94), Vikrant (1.02)
Rice bean	Protein (%)	LRB330 (20.90), LRB351 (20.53), RBL-6 (20.43)
	Tryptophan (%)	LRB122 (4.80), RBL-6 (4.57)
	Methionine (%)	PRR-2 (0.95). LRB224 (0.90), LRB234 (0.90), RBL-6 (0.90)
	Phenol (%)	PRR-2 (0.23), PRR9402 (0.22), RBL-1 (0.20)

7.4 AGRONOMY

Thirteen agronomic experiments were conducted on five underutilized crops at different centres of the project during 2006. These consisted of five in grain amaranth, two in buckwheat, four in rice bean and one each on kalingada and Jatropha. The salient findings are given below:

S. No.	Experiment	Finding
1.	Effect of spacing and fertilizer levels on different genotypes of amaranth	The recommended dose (RD) of fertilizer(N: P :: 60:40 kg /ha) gave better yield than that of 75% of the RD. A wider row spacing (45x 15 cm) resulted in higher yield of grain amaranth at Bengalore , while closer spacing (30x15 cm) resulted in higher yield at Bhubaneswar and SK Nagar.
2.	Integtrated nutrient management studies in grain amaranth	The highest grain yield was obtained when in the recommended doze of fertilizer 75% of N was applied through chemical fertilizer and 25% through FYM .

3.	Effect of sowing time and spacing on late sown grain amaranth(Var. Annapurna) in Gujarat	There was no significant differences in yield for November sowings(10^{th} and 25^{th}) However, closer spacing (22.5x10 cm) resulted in higher yield than wider spacing (45x10cm).
4.	Evaluation of organic sources of nitrogen in grain amaranth in Garwal Hills	RDF (N:P:: 60: 40 kg /ha) gave the highest yield of grain amaranth than other combinations of organic manures (Chullucake, vermicompost, FYM and Azotobacter)
5.	Popularization of grain amaranth in Farmers fields in non conventional areas of Karnataka	Results still awaited. However, last year in Tamilnadu there was a good response and private companies had come forward for MOU with TNAU for contract farming
6.	Response of promising buckwheat genotypes to fertilizer doses	Fertilizer doze of NPK (40: 40: 20 kg /ha) gave significantly higher yield than that of farmers practice(N:P:K :: 15: 15: 15 kg/ha) and RDF (N:P:K: : 40:40: 00 kg/ha). Himpriya produced highest among all varieties
7.	Integrated nutrient management studies in buckwheat	FYM @ 4.0t /ha + Azotobacter produced significantly higher yield than RDF and Chullu cake @2.5 t/ha + Azotobacter
8.	Performance of rice bean in comparison with prevailing pulse crops	Rice bean gave more seed and fodder yield than black gram and green gram at Bengalore and Bhubaneswar indicating scope of its cultivation in states of Karnataka and Orissa.
9.	Performance of rice bean based crop rotations under varying conditions	Results of Rabi crops will be available next year and then inferences will be drawn
10.	Integrated nutrient management studies in rice bean	Highest yield in rice bean was obtained by applying RDF alone or in combination with other treatments. However, other manorial treatments led to increase in yield over control
11.	Effect of spacing , nutrients and pruning in Jatropha	Plant height and number of branches per plant were recorded to increase with spacing fertilizer doze and age.

ANNEXURES

Annexure - I

Weighted mean seed yield (q/ha) of buckwheat varieties for the last three years

S.No.	Genotype	2004		2005		2006		Weighted			Percent increase/decrease over check over check			
		Mean	Location	Mean	Location	Mean	Location	Mean	Location	Rank	Himpriya	PRB-1	Shimla B-1	VL-7
1	SMLBW-3	15.80	4	13.66	4	4.68	3	11.99	11	3	-11.52	58.59	-0.42	79.21
2	Himpriya(C)	18.41	4	12.69	4	8.20	3	13.55	11	1	-0.03	79.17	12.50	####
3	PRB-1(C)	6.89	4	9.90	4	5.32	3	7.56	11	4	-44.23	-0.05	-37.24	12.95
4	Shimla B-1 (C)	12.72	4	14.65	4	7.67	3	12.04	11	2	-11.11	59.32	0.04	80.04
5	VL-7(C)	4.11	1	5.85	4	8.67	3	6.69	8	5	-50.63	-11.51	-44.44	0.00
	Mean	**11.59**		**11.35**		**6.91**		**10.37**						

Annexure - II

Weighted mean days to maturity of buckwheat varieties for the last three years

S. No.	Genotype	2004		2005		2006		Weighted			Percent increase/decrease over check over check			
		Mean	Location	Mean	Location	Mean	Location	Mean	Location	Rank	Himpriya	PRB-1	Shimla B-1	VL-7
1	SMLBW-3	122.75	4	113.00	4	123.33	3	119.36	11	4	-2.65	2.44	48.26	46.69
2	Himpriya(C)	126.92	4	116.50	4	125.00	3	122.61	11	5	0.00	5.22	52.29	50.68
3	PRB-1(C)	118.43	4	111.58	4	120.56	3	116.52	11	3	-4.97	0.00	44.73	43.20
4	Shimla B-1 (C)	81.50	4	81.83	4	77.44	3	80.51	11	1	-34.33	-30.90	0.00	-1.05
5	VL-7(C)	124.00	1	79.00	4	70.33	3	81.37	8	2	-33.63	-30.16	1.07	0.00
	Mean	**114.72**		**100.38**		**103.33**		**104.08**						

Annexure - III

Weighted mean seed yield(q/ha) of adzukibean varieties for the last three years

S.No.	Genotype	2004		2005		2006		Weighted			Percent increase/ decrease over check
		Mean	Location	Mean	Location	Mean	Location	Mean	Location	Rank	
1	HPAB-30			7.92	3	10.50	3	9.21	6	6	-34.73
2	SMLAB-4	23.41	3	8.42	3	11.41	3	14.41	9	3	2.15
3	SMLAB-6	27.84	3	7.34	3	10.60	3	15.26	9	1	8.15
4	SMLAB-9	27.18	3	7.25	3	10.81	3	15.08	9	2	6.87
5	SMLAB-10	24.31	3	6.24	3	11.91	3	14.15	9	4	0.31
6	HPU51(C)	21.69	3	8.29	3	12.36	3	14.11	9	5	0.02
	Mean	**24.89**		**7.58**		**11.27**		**13.71**			

Annexure - IV

Weighted mean days to maturity of adzukibean varieties for the last three years

S.No.	Genotype	2004		2005		2006		Weighted			Percent increase/ decrease over check over check HPU51
		Mean	Location	Mean	Location	Mean	Location	Mean	Location	Rank	
1	HPAB-30			99.11	3	108.67	3	103.89	6	3	-0.35
2	SMLAB-4	101.56	3	99.56	3	106.78	3	102.63	9	1	-1.56
3	SMLAB-6	102.89	3	98.67	3	110.67	3	104.08	9	4	-0.18
4	SMLAB-9	106.00	3	101.00	3	110.22	3	105.74	9	6	1.42
5	SMLAB-10	101.11	3	98.33	3	109.67	3	103.04	9	2	-1.17
6	HPU51(C)	109.11	3	99.67	3	104.00	3	104.26	9	5	0.00
	Mean	**104.13**		**99.39**		**108.34**		**103.94**			

Annexure-V

Mean Protein (%) and Lysine (g/16g N) of grain amaranth varieties tested for the last three years: Plains

S. No.	Genotypes	Protein (%)						Lysine (g/16 g N)					
		2003	2004	2005	Mean	Rank	Per cent increase/ decrease over check varietry	2003	2004	2005	Mean	Rank	Per cent increase/ decrease over check varietry
1	BGA-2	13.3	13.2	14.2	13.57	1	7.93	4.7	5.2	4.7	4.87	5	-6.95
2	BGA-3	13.1	11.9	13.9	12.97	3	3.16	4.8	4.8	4.8	4.80	8	-8.22
3	GA-1	13.4	12.6	13.7	13.23	2	5.28	5.4	4.6	4.5	4.83	6	-7.58
4	MGA-2	11.7	12.3	11.4	11.80	8	-6.13	5.4	4.6	5.3	5.10	3	-2.49
5	RMA-3	13.6	12	11.7	12.43	5	-1.09	4.8	4.9	5.1	4.93	4	-5.67
6	RMA-4	11.7	12.1	12.1	11.97	7	-4.80	5.1	5.2	4.2	4.83	7	-7.58
7	SKNA-21	11.8	11.8	13.3	12.30	6	-2.15	5.6	5.2	5.2	5.33	1	1.98
8	Suvarna	12.4	12.2	13.1	12.57	4	0.00	5.4	5.2	5.1	5.23	2	0.00
	Mean	**12.625**	**12.3**	**12.93**	**12.6**			**5.15**	**4.96**	**4.863**	**4.992**		

Annexure-VI

Mean Protein (%, Tryptophan in protein (%), methionine (%) and phenol (%) of rice bean varieties tested for the last three years: Plains

Sr. No.	Genotypes	Protein (%)						Tryptophan in protein (%)					
		2003	2004	2006	Mean	Rank	Per cent increase/ decrease over best check varietry	2003	2004	2006	Mean	Rank	Per cent increase/ decrease over best check varietry
1	KHRB-1	18.9	20.9	20.4	20.07	4	-1.78	4.40	4.50	0.87	3.26	14	-28.74
2	LRB-122	20.5	19.3	18.8	19.53	9	-4.39	6.90	6.80	0.70	4.80	1	5.03
3	LRB-224	18.4	18.6	18.5	18.50	14	-9.45	5.50	5.30	0.67	3.82	7	-16.34
4	LRB-234	20.8	18.5	19.0	19.43	10	-4.88	4.60	4.90	0.70	3.40	11	-25.60
5	LRB-330	22.6	18.8	21.3	20.90	1	2.30	4.30	4.90	0.84	3.35	12	-26.77
6	LRB-351	21.2	20.0	20.4	20.53	2	0.51	4.50	5.10	0.77	3.46	10	-24.36
7	PRR-2	20.8	20.0	19.3	20.03	5	-1.94	4.40	4.60	0.94	3.31	13	-27.50
8	PRR-9402	19.8	19.5	19.4	19.57	7	-4.23	5.00	4.80	0.64	3.48	9	-23.85
9	RBL-33-1	20.1	19.6	18.2	19.30	12	-5.53	5.50	5.90	0.74	4.05	5	-11.45
10	RBL-99	19.4	18.8	20.5	19.57	8	-4.23	6.10	5.70	0.77	4.19	3	-8.32
11	RBL-1	19.4	17.7	20.9	19.33	11	-5.37	5.20	5.80	0.70	3.90	6	-14.66
12	RBL-6	21.0	19.6	20.7	**20.43**	3	0.00	6.60	6.40	0.70	**4.57**	2	0.00
13	RBL-35	19.7	19.4	20.4	19.83	6	-2.92	5.20	5.40	0.74	3.78	8	-17.29
14	RBL-50	18.4	18.9	20.5	19.27	13	-5.69	5.80	5.80	0.70	4.10	4	-10.28
	Mean	**20.07**	**19.26**	**19.88**	**19.74**			**5.29**	**5.42**	**0.75**	**3.82**		

Sr. No.	Genotypes	Methionine (%)						Phenol (%)					
		2003	2004	2006	Mean	Rank	Per cent increase/ decrease over best check varietry	2003	2004	2006	Mean	Rank	Per cent increase/ decrease over best check varietry
1	KHRB-1	0.84	0.88	0.89	0.87	8	-3.33	0.19	0.22	0.18	0.20	6	-1.67
2	LRB-122	0.83	0.88	0.87	0.86	11	-4.44	0.15	0.18	0.21	0.18	14	-10.00
3	LRB-224	0.91	0.93	0.87	0.90	2	0.37	0.18	0.19	0.19	0.19	12	-6.67
4	LRB-234	0.87	0.91	0.93	0.90	3	0.37	0.18	0.19	0.21	0.19	10	-3.33
5	LRB-330	0.94	0.91	0.79	0.88	7	-2.22	0.21	0.18	0.19	0.19	8	-3.33
6	LRB-351	0.83	0.86	0.79	0.83	14	-8.15	0.20	0.21	0.23	0.21	3	6.67
7	PRR-2	0.94	0.93	0.98	0.95	1	5.56	0.24	0.23	0.22	0.23	1	15.00
8	PRR-9402	0.83	0.84	0.92	0.86	10	-4.07	0.22	0.21	0.24	0.22	2	11.67
9	RBL-33-1	0.97	0.88	0.82	0.89	6	-1.11	0.22	0.21	0.19	0.21	4	3.33
10	RBL-99	0.82	0.85	0.85	0.84	13	-6.67	0.21	0.19	0.19	0.20	7	-1.67
11	RBL-1	0.89	0.88	0.92	0.90	5	-0.37	0.20	0.21	0.20	**0.20**	5	0.00
12	RBL-6	0.90	0.92	0.88	**0.90**	4	0.00	0.18	0.19	0.18	0.18	13	-8.33
13	RBL-35	0.82	0.86	0.92	0.87	9	-3.70	0.22	0.19	0.16	0.19	11	-5.00
14	RBL-50	0.85	0.88	0.80	0.84	12	-6.30	0.21	0.19	0.18	0.19	9	-3.33
	Mean	**0.87**	**0.89**	**0.87**	**0.88**			**0.20**	**0.20**	**0.20**	**0.20**		

Annexure-VII

Mean Protein (%) and Vicine-convicine (%) of grain faba bean varieties tested for the last three years: Plains

S. No.	Genotypes	Protein (%)						Vicine-convicine (%)					
		2003	2004	2005	Mean	Rank	Per cent increase/ decrease over best check varietry	2003	2004	2005	Mean	Rank	Per cent increase/ decrease over best check varietry
1	BSH-9	23.80	23.80	25.20	24.27	12	-3.70	1.06	0.98	1.10	1.05	11	-9.77
2	HB-043	23.80	23.80	26.80	24.80	7	-1.59	0.82	0.88	1.27	0.99	6	-14.66
3	HB-115	22.60	24.10	28.50	25.07	6	-0.53	0.74	1.03	1.27	1.01	8	-12.64
4	HB-123	22.60	24.20	28.70	25.17	4	-0.13	0.98	1.12	1.14	1.08	12	-6.90
5	HB-131	24.80	23.20	24.90	24.30	11	-3.57	0.80	0.87	1.02	0.90	1	-22.70
6	HB-180	23.10	26.20	26.80	25.37	2	0.66	0.92	1.10	1.22	1.08	13	-6.90
7	HB-193	22.90	25.20	26.30	24.80	8	-1.59	0.73	0.96	1.22	0.97	5	-16.38
8	HB-405	21.00	24.80	25.90	23.90	13	-5.16	0.72	1.02	1.31	1.02	9	-12.36
9	HB-428	22.20	23.80	25.40	23.80	14	-5.56	0.76	0.89	1.17	0.94	3	-18.97
10	HB-430	22.40	25.20	28.90	25.50	1	1.19	0.76	1.02	1.11	0.96	4	-16.95
11	NDF-1	22.80	24.20	27.10	24.70	9	-1.98	0.75	0.94	1.32	1.00	7	-13.51
12	PRT-7	23.10	25.90	24.90	24.63	10	-2.25	0.75	0.98	1.02	0.92	2	-20.98
13	PRT-12	24.30	24.80	26.30	25.13	5	-0.26	1.22	0.92	1.35	**1.16**	14	0.00
14	Vikrant	23.60	25.60	26.40	**25.20**	3	0.00	0.88	0.89	1.28	1.02	10	-12.36
	Mean	**23.07**	**24.63**	**26.58**	**24.76**			**0.85**	**0.97**	**1.20**	**1.01**		

Annexure-VIII

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	-	1	**12**	5	-	4	1	**10**	83.33
S.K. Nagar	11	6	-	1	**18**	8	-	3	1	**12**	66.67
Rahuri	12	-	-	-	**12**	10	-	-	-	**10**	83.33
Mettupalayam	7	4	-	-	**11**	3	-	2	-	**5**	45.45
Bhubaneswar	10	5	-	-	**15**	7	-	3	-	**10**	66.67
Ranichauri	15	4	-	1	**20**	11	-	3	2	**16**	80.00
Hisar	8	4	-	-	**12**	6	-	3	-	**9**	75.00
Ranchi	7	-	-	-	**7**	6	-	-	-	**6**	85.71
Ludhiana	3	1	-	-	**4**	3	-	0	-	**3**	75.00
Faizabad	7	-	-	-	**7**	6	-	-	-	**6**	85.71
Ambikapur	11	-	-	-	**11**	6	-	-	-	**6**	54.55
Mandor	10	-	-	-	**10**	4	-	-	-	**4**	40.00
Palampur	12	2	-	2	**16**	7	-	0	-	**7**	43.75
Sangla	3	2	-	3	**8**	2	-	0	1	**3**	37.50
Shimla	10	-	-	-	**10**	8	-	-	-	**8**	80.00
Shillong	5	-	-	-	**5**	3	-	-	-	**3**	60.00
Almora	4	-	-	-	**4**	4	-	-	-	**4**	100.00
Delhi	4	-	-	-	**4**	3	-	-	-	**3**	75.00
Bhowali	4	-	-	-	**4**	2	-	-	-	**2**	50.00
Total	**150**	**32**	**-**	**8**	**190**	**104**	**-**	**18**	**5**	**127**	**66.84**

Annexure-IX

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*)

Annexure-X

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 rpdua@nbpgr.ernet.in	011-25841835	0124-2461666 M.-9868896266
	Dr. B.S. Phogat Sr. Scientist (Agronomy)	011-25841835	011-25841835	011-25088241
	Dr. Hanuman Lal Scientist (Statistics)	011-25841835 hlal@nbpgr.ernet.in drhanumanlal@yahoo.co.in	011-25841835	M.-9968271997
	Dr. R.S. Rathi Technical Officer	011-25841835	011-25841835	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, 246	09448381748
	Dr. A.P. Nagaraju Professor of Agronomy	080-23414848 npratibha29@rediffmail.com	080-23411483	09449082833
2	**Orissa University of Agriculture & Technology, Bhubaneswar – 751 003**			
	Dr. P.K. Sahu Plant Breeder	0674-2391692 (DOR) drpks_ve@ yahoo.co.in	0674-2392818 2402818-131	0674-2564101 09437229450
	Dr. S. Jena Jr. Agronomist	0674-2391692 0674-2391780	0674-2392818, 2402818-131	09937282043(M) 0674-2562255
3	**CCS Haryana Agricultural University, Hisar – 125 004**			
	Dr. P.K. Verma Head (MAP & UC)	01662-234952, 234613	01662-237726 Ext. 4283 01662-231171 231173 231172	01662-228308
	Dr. J.S. Hooda Plant Breeder	mauup@hau.ernet.in		09416590652
	Dr. R.S. Karwasara Sr. Agronomist	mauup@hau.ernet.in		01662-226934
	Dr. M. Khabiruddin Jr. Phytochemist	mauup@hau.ernet.in		09416325484

		Fax	Phone (O)	Phone (R)
4.	**Forest College & Research Institute (TNAU), Mettupalayam – 641 301**			
	Dr. K. Kumaran	04254-225064 drkkmail@gmail.com	04254-222010	M.- 09443377970
	Dr. N. Chezhian Prof.	04254-225064	04254-222010	M.- 09442006268
	Dr. M. Govinda Rao Dean	deanfor@tnau.ac.in	04254-220398	M.- 09442176414
5	**Mahatma Phule Agricultural University, Rahuri – 413 722**			
	Dr. G.D. Mukhekar Plant Breeder	02426-243223 ganprtmukhekar@yahoo.com	02426-243249	09860678634
6	**Birsa Agricultural University, Ranchi – 834 006**			
	Dr. Chandra Shekar Mehto Sr. Scientist	0651-2455850 0651- 2450625 csmahto@rediffmail.com	2450625	0651-2450848 09835134007 (M)
7	**College of Forestry & Hill Agriculture (GBPUAT), Ranichauri – 249 199**			
	Dr. M. Dutta Professor Plant Breeding & TPL (Plant Breeding)	01376-252606 manoranjandutta@rediffmail.com, mdutta_52@ yahoo. co .in	01376-252121, 252119	09412437301
	Dr. T.P. Singh Jro.Agronomy Agronomist	01376- 252606	252138,252138	252014 9411184948(M)
8	**Sardar Krushinagar Dantiwada Agri. Univ. (SDAU), Sardar Krushinagar Distt. Banaskantha – 385 506**			
	Dr. Y. Ravinder Babu Assoc. Res. Sci. (Pl.Br.)	02748-278397 ravindrababuy@yahoo.com	02748-278471	02748-279003 09427493331
	Dr. B.M. Patel Asstt. Res. Sci. (Agronomy)		02748-278471	02742-251268 9879245373
9	**Punjab Agricultural University, Ludhiana – 141 004**			
	Dr. Gurtej Singh Brar Ext. Specialist (FC)	0161-2459065	0161-2401960-70 Ext. 435	098149-03107

		Fax	Phone (O)	Phone (R)
10	**Agricultural Research Station (RAU), Mandor, Jodhpur – 342 304**			
	Dr. B.R. Choudhary	0291-2571347 choudharybr@yahoo.com	0291-2571813	M.-09414477158
11	**CSK Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur – 176 062**			
	Dr. Rakesh Chahota Asstt. Prof. Plant Breeding	01894-230511 rkchahota@yahoo.com rchahota@hillagric.ernet.in	01894-230391	09418103249
12	**RMD College of Agri. & Research Centre, P.O. Box No. 3, Post Ajmera (Chattisgarh) (IGKV), Ambikapur – 497 001**			
	Dr. M.K. Singh Sr. Scientist (Underutilized Crops)	07774-220066 (Private) 07774-230986 mksinghscientist@rediffmail.com	07774-230815, 230986, 230056	07774-231820, M.-09425256250
13	**Narendra Dev University of Agriculture & Technology, Faizabad – 224 229**			
	Dr. C.B. Yadav Deptt. of G.P.B Scientist incharge Underutilized Crops		05270-262051	05270-220977 09415370532
C.	**COOPERATING CENTRES**			
	Dr. J.C. Rana Sr. Scientist NBPGR Regional Station Shimla	0177-2235453 ranaje2003@yahoo.com, headmnbpgre.dataone.in	0177-2835459,	09418104185
	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

		Fax	Phone (O)	Phone (R)
	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	
	Dr. Sudhir Shukla Scientist Deptt. Pl. Br. & Gen.			
2	**Vivekananda Parvatiya Krishi Anusandhan Shala, Almora**			
	Dr. Arun Gupta Sr.Scientist	05962-231539 arung66@yahoo.com	05962-241003, 241005 Ext. 105	09412924877
3	**Himachal Pradesh Krishi Vishwavidyalay, Sangla**			
	Dr. Gopal Katna Mountain Agricultural Research and Extension Centre (CSK HPKV) Sangla – 172106 Kinnaur Distt. (H.P.)	01786-242332		09418155748
4.	**Rajasthan Agri. University – Mandor – Jodhpur**			
	Dr. B.R. Choudhary Agri. Res. Station, Mandor – Jodhpur – 341304 (Rajasthan)	0291-2571813 choudharybr@yahoo.com		0291-2547754 09414477158
5.	**ICAR Complex for NEH, Regional Barapani**			
	Dr. Sanjay Gupta Sr. Scientist Plant Breeding Div. ICAR Complex for NEH Regional, Barapani - 793103	0364-2570364 sanju_in@rediffmail.com		0364-2570006 09436166539

		Fax	Phone (O)	Phone (R)
10	**Agricultural Research Station (RAU), Mandor, Jodhpur – 342 304**			
	Dr. B.R. Choudhary	0291-2571909 choudharybr@yahoo.com	0291-2571813	0291-2547754, M.-09414477158
11	**CSK Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur – 176 062**			
	Dr. Rakesh Chahota Asstt. Prof. Plant Breeding	01894-230511 rkchahota@yahoo.com rchahota@hillagric.ernet.in	0184-230391	09418103249
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)	07774-220066 (Private) 07774-230986, 220099 mksinghscientist@rediffmail.com	07774-230815, 230986, 230056	07774-220069, 241169 (R) M.-09425256250
13	**Narendra Dev University of Agriculture & Technology, Faizabad – 224 229**			
	Dr. C.B. Yadav Scientist incharge Underutilized Crops		05270-262051	05270-220977 09415370532
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

VARIETIES IDENTIFIED

CROP	VARIETY	FEATURES	AREA	DEVELOPED BY
Kankoda (*Momordica dioica*)	Indira Kankoda (RMF-37)	High fruit yield	Chhatisgarh, U.P., Jharkhand, Orissa and Maharashtra	Dr. M.K. Singh RMD College of Agriculture, Ambikapur
Jatropha (*Jatropha curcas*)	Chhatrapati (SDAUJ-1)	High yield and high oil content	Gujarat, Orissa, Haryana and Maharashtra	Dr. Y. Ravindrababu Dr. B.M. Patel Dr. N.H. Patel Dr. M.M. Patel SDAU, S.K. Nagar

Cover Photo: Fruits of Kankoda Variety RMF 37