

Trait Specific Germplasm Identified Through Multi-location Evaluation of Pigeonpea (2004 - 2006)



Compiled by:

R.P. Dua

H.L. Raiger

Jyoti Kumari

Ashok Kumar

O.P.Dahiya

M. Dutta

K.C. Bansal



Germplasm Evaluation Division
National Bureau of Plant Genetic Resources, New Delhi



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It gives us immense pleasure to place before you the Trait Specific Germplasm Identified Through Multi-location Evaluation of Pigeonpea (2004-2006). Since there is component of GxE interaction, it is always desirable that the germplasm can be evaluated at a multiple location to identify stable desirable traits and region specific genotypes for their optimal utilization. With the objective a programme was initiated for multilocation evaluation of germplasm at NBPGR. The pigeonpea is an important pulse crop. However, India has to import the pulses to meet the demand of growing population. This necessitates a further improvements in productivity level of cultivars endowed with resistant to biotic / abiotic stress. It requires identification of the proper trait specific donors for utilization in breeding programme. NBPGR initiated a programme to evaluate the material across the zones to identify stable and desirable trait promising accessions for various agronomic traits and biotic/abiotic stresses from the germplasm. This programme was initiated in 2004 across the zone of the country and promising accessions have been identified over the last three years. This information will be useful to breeders, researchers to select a material for further improvement.

It is to place on record our sincere gratitude to all the scientists for planning, conducting and recording observations on trials/experiments on pigeonpea for multilocation evaluation programme (2004 to 2006).

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Authors

INTRODUCTION

In any crop improvement programme, the availability of good germplasm is a pre requisite. At the national level, NBPGR has been given the mandate to manage germplasm to cater the needs of breeders and researchers. Before its utilization, it is of utmost importance that the germplasm is properly characterized, evaluated and documented for its exact identification. Since GxE interaction plays major role on the expression of quantitative traits, it is always desired that the germplasm be evaluated at multilocations to identify stable and region specific genotypes. With this consideration a programme was initiated for multilocation evaluation of the germplasm available at NBPGR in the National Gene Bank.

In India, pigeonpea is the second most important pulse crop next to chickpea, covering an area around 3.53 m ha with an annual production of 2.51 m t and productivity of 672 kg per ha. Pigeonpea has several unique features, by virtue of which it occupies a predominant place as a food crop in several cropping systems all over India. Its cultivation, with year to year fluctuations has increased from 2.25 m ha during 1949-50 to 3.53 m ha in 2009. India is considered as the primary centre of origin for pigeonpea. Though, this crop has a very good potential for seed yield to the tune of 3-4 t per ha but its productivity has not increased over the years. This necessitates further evaluation of the germplasm collected from various sources to identify good donors with respect to various agronomic traits and resistance to biotic and abiotic stresses for their utilization in breeding programme. Therefore, an attempt was made at NBPGR, a nodal institute for PGR management, to evaluate the material across the zones to identify the promising accessions for various agronomical traits, biotic and abiotic stresses and for the protein content from the available germplasm. The project on multi-location evaluation of pigeonpea germplasm was initiated in *kharif* 2004. The material was received from National Gene Bank (NGB), NBPGR, New Delhi during *kharif* 2004-06 and multiplied at SDAU, S.K. Nagar (Gujarat). Data from different locations have been generated, analyzed and compiled. The character-wise promising accessions for each centre and over all the locations have been identified given in this bulletin. We hope this document on pigeonpea will be useful to germplasm curators, breeders, researchers and students to select material for their further use in studies and pigeonpea improvement programme.

List of Contributors for Multi-location Evaluation of Pigeonpea

Aspect	Cooperating Scientist	Location
Agronomic evaluation	Dr. S.M. Sudewad	MAU ARS, Badnapur
	Dr. M. Byre Gowda	UAS, Bangalore
	Dr. S. Rajarathinam & Dr. N. Nadarajan	TNAU, Coimbatore
	Dr. S.J. Singh	RAS, Durgapura
	Dr. I.P.Singh	IIPR, Kanpur
	Dr. R.P. Singh	CSAUA&T, Kanpur
	Dr. J.S. Sandhu	PAU, Ludhiana
	Dr. B.M. Jamadagni	MPKV. Rahuri
	Dr. U.P. Singh, Dr. M.N. Singh	BHU, Varanasi
	Dr. B.P.S. Malik	CCS HAU, Hisar
	Dr. P. S. Dharamraj	UAS, ARS, Gulbarga
	Dr. S. Vanisree	ANGRAU, ARS, Warangal
Biotic stress (Diseases)	Dr. S.M. Sudewad	MAU, ARS, Badnapur
	Dr. M. Byre Gowda	UAS, Bangalore
	Dr. J.P. Upadhyay	RAU, Dholi
	Dr. S.J. Singh	RAS, Durgapura
	Dr. P. S. Dharamraj	UAS, ARS, Gulbarga
	Dr. B.M. Jamadagni	MPKV. Rahuri
Quality (Protein)	Dr. S. Mandal	NBPGR, New Delhi
	Dr. Sangita Yadav	NBPGR, New Delhi
Coordination	Dr. R.P. Dua	NBPGR, New Delhi
	Dr. Mohar Singh	NBPGR, New Delhi
	Dr. O.P Dahiya	NBPGR, New Delhi
	Dr. S .K Mishra	NBPGR, New Delhi
	Dr. M. Dutta	NBPGR, New Delhi
Documentation	Dr. H.L Raiger	NBPGR, New Delhi

Details of Multi-location Evaluation of Pigeonpea Germplasm at different Centres

Evaluation	Trait	No. of locations	Location	Acc. (Nos.)
2004				
Agro-morphological	Agronomic	7	IIPR, Kanpur; PAU, Ludhiana; UAS, Bangalore; TNAU, Coimbatore; BHU, Varanasi; MPKV, Rahuri; MAU ARS, Badnapur	Set – I 375 acc. Set – II 375 acc.
Biotic stress (Diseases)	Wilt	7	UAS, Bangalore; MAU ARS, Badnapur; RAU, Dholi; MPKV, Rahuri	Set – I 375 acc. Set – II 375 acc.
	SMD	2	UAS, Bangalore; MAU ARS, Badnapur	Set – I 375 acc. Set – II 375 acc.
Quality	Protein	1	NBPGR, New Delhi	Set – I 375 acc.
2005				
Agro-morphological	Agronomic	8	CSAU, Kanpur; PAU, Ludhiana; UAS, Bangalore; TNAU, Coimbatore; UAS, ARS, Gulbarga; BHU, Varanasi; MPKV, Rahuri; ANGRAU, ARS, Warangal	Set – I 480 acc. Set – II 459 acc.
Biotic stress (Diseases)	Wilt	3	MAU ARS, Badnapur; RAU, Dholi; UAS, ARS, Gulbarga	Set – I 480 acc. Set – II 459 acc.
	SMD	4	UAS, Bangalore; MAU ARS, Badnapur; RAU, Dholi; ARS RAU, Durgapura	Set – I 480 acc. Set – II 459 acc.
Quality	Protein	1	NBPGR, New Delhi	Set – I 480 acc. Set – II 459 acc.
2006				
Agro-morphological	Agronomic	7	CSAU, Kanpur; PAU, Ludhiana; UAS, Bangalore; TNAU, Coimbatore; CCS HAU, Hisar; BHU, Varanasi ; RAS, Durgapura	453 acc.
Biotic stress (Diseases)	Wilt	2	MAU ARS, Badnapur; RAU, Dholi	453 acc.
	SMD	2	MAU ARS, Badnapur; RAU, Dholi	453 acc.

PROMISING ACCESSIONS OF PIGEONPEA

Characters	Location	Year	Sets	Range	Promising Accessions	Value of best check
Agronomic Traits						
Days to 50% flowering	Badnapur	2004	I	66.0 - 120.0	IC245130, IC245132, IC245131, IC245296, IC73916 (<78.00)	P33 (103.00)
			II	71.0 - 124.0	IC73954, IC74155, IC73968, IC74043, ICP6626 (<92.00)	P33 (103.00)
	Bangalore	2004	I	54.0 - 178.0	IC245227, IC245130, IC245131, IC245183(<57.00)	UPAS 120 (64.70)
			I	70.7 - 198.0	None	ICPL-87 (70.67)
		2006		61.0 - 134.0	ICPL-00079, IC244944, P-942-2, IC245946, IC245957 (=61.00)	Pusa-992 (76.89)
	Coimbatore	2004	I	45.0 - 98.0	IC245136, IC245234, IC245240, IC245266, IC245272 (=45.00)	UPAS120 (55.00)
			II	45.0 - 89.0	IC74141, IC74146, IC74147, IC74142, IC74149 (<49.00)	UPAS120 (55.00)
		2005	I	730.0 - 175.0	None	GT-100 (73)
		2006		60.0 - 155.0	Trianx316P12, IC490563, AL-1357-2, IC022494, IC033022 (<=64.00)	-
	Kanpur	2004	I	59.0 - 143.0	IC245229, IC245183, IC245218, IC245221, IC245243, IC245256 (<61.00)	P992 (73.38)
			II	67.0 - 150.0	IC73954 (<66.00)	P992 (73.38)
		2005	I	64.0 - 155.0	IC015722, IC022555, IC022519, IC022520, IC22548 (<82.00)	GT-100 (81.67)
		2006		46.0 - 158.0	IC490604, NIC-18870, IC490873, IC490882, IC490499 (<75.00)	-
	Ludhiana	2004	I	68.0 - 101.0	IC245183, IC245218, IC245143, IC245178, IC245181 (<75.00)	-
		2005	I	3.02 - 152.0	IC022541, IC022543, IC490598, IC015711-1, IC022519 (<122.00)	G-101 (132)
		2006		77.0 - 150.0	IC033715, IC490619, IC490873, ICPL-00079, IC244944 (=77.00)	Pusa-991 (77.00)
	Rahuri	2004	I	67.0 - 152.0	IC245543, IC245517, IC245518, IC245550, IC245558 (<59.00)	UPAS120 (68.33)
		2005	I	78.0 - 198.0	IC022551, IC033521, IC015708, IC015717, IC016209-1 (< 98.00)	GT-100 (109)
	Varanasi	2004	I	46.0 - 140.0	IC245183, IC245131, IC245221, IC245220, IC245176 (<59.00)	P992 (74.40)
			II	63.0 - 142.0	ICP6221 (<64.00)	P992 (74.40)

Days to 50% flowering	Varanasi	2005	I	67.0 - 181.0	IC016208-2, IC016208-1 (<75.00)	ICPL-87 (76.67)
			II	63.0 - 158.0	IC244985 (<64.00)	GT-100 (83.33)
		2006		60.0 - 152.0	IC490722, IC490619, IC245173, IC490594, AL-1363-4 (<70.00)	Pusa-991 (71.00)
	Gulbarga	2005	II	72.0 - 135.0	IC245316, IC245302, IC245310, IC245363 (<74.00)	ICPL-87 (79.33)
	Warangal	2005	II	72.0 - 178.0	IC245551, Panta-110, IC245323, IC245314, IC245319 (<78.00)	ICPL-87 (92.29)
	Durgapur	2006		70.0 - 93.0	IC490801, IC490631, IC490257, IC490841, V89/0-145 (=70.00)	Pusa-991 (75.18)
	Hisar	2006		77.0 - 150.0	IC033715, IC490619, ICPL-00079, IC244944, P-942-2 (=77.00)	Pusa-991 (77.00)
	Pooled over locations	2004	I	64.3-126.3	IC245518, IC245183, IC245218, IC245541, IC245539 (< 67.7)	UPAS120 (74.00)
			II	72.8-119.8	IC073954 (= 72.8)	UPAS120 (74)
		2005	I	88.2-161.0	IC022541, IC022543 (< 90)	GT100 (91.3)
II			71.67-157.5	IC245319, IC245340, IC244891, IC245001, IC245482 (< 73)	ICPL87 (97)	
2006			64.43-130.29	IC245149, IC245173, IC245076, IC245074, IC245155 (< 74)	Pusa 991 (76.53)	
Days to maturity	Badnapur	2004	I	124.0 - 91.0	IC245130, IC245131, IC245296, IC245132, IC73916, IC245295 (<143.00)	P-992 (167.00)
			II	129.0 - 95.0	IC73954, IC74155, IC74043, IC74105, ICP6626, IC74157 (<155.00)	P-992 (167.00)
	Bangalore	2004	I	92.0 - 210.0	IC245234, IC245148, IC245303, IC245344 (<94.00)	P-992 (103.50)
		2005	I	109.8 - 249.0	None	ICPL-87 (109.83)
		2006		91.0 - 168.0	IC245200, ICPL-00079, IC245036, IC245989, IC245258, IC244989, IC245258 (<93.00)	Pusa-991 (115.67)
	Coimbatore	2004	I	82.0 - 137.0	IC245137, IC245240, IC245272, IC245273, IC245279 (<=83.00)	UPAS120 (92.00)
			II	85.0 - 119.0	IC74178, IC74061, IC299061, ICP 801 (<86.00)	UPAS120 (92.00)
		2005	I	125.0 - 192.0	None	GT-100 (125)
		2006		100.0 - 190.0	AL-1357-2, AL-1363-4, IC033022, IC245191, IC245199 (<102.00)	-
	Kanpur	2004	I	119.0 - 260.0	IC245196, IC245512, IC245509, IC245515, IC245513 (=119.00)	P33 (120.80)
			II	120.81 - 263.0	None	P33 (120.81)

Days to maturity	Kanpur	2005	I	200.0 - 280.0	IC014994, IC490843 (<207.00)	GT-100 (222.33)
		2006		146.0 - 222.0	IC015707-1, IC014670, IC508282, IC033835, IC508283, IC490710 (<=166.00)	-
	Ludhiana	2006		125.0 - 157.0	IC245035, ICPL-00004, IC245074, IC244953, IC245300 (<127.00)	Pusa-2001 (133.00)
	Rahuri	2004	I	127.0 - 237.0	IC245221 (<128.00)	UPAS120 (150.42)
		2005	I	106.0 - 215.0	IC056075, IC032994, IC490659, IC490898 (<197.00)	GT-100 (201.33)
	Varanasi	2004	I	103.0 - 210.0	IC245227, IC245229, IC245221 (<110.00)	P33 (122.00)
			II	116.0 - 223.0	IC74177 (<117.00)	P33 (122.00)
		2005	I	172.0 - 228.0	IC022519, IC033726, IC015711, IC015711-1, IC025064 (=172.00)	GT-100 (200.33)
			II	122.0 - 229.0	IC244985, SEL-83034, IC244886, IC244970, IC244974 (=122.00)	GT-100 (182)
		2006		15.0 - 254.0	IC490837, IC490934, IC244966, IC245199, IC244975, IC245083 (<122.00)	Pusa-2001 (126.33)
		Gulbarga	2005	II	110.0 - 177.0	IC245444, IC000595, IC245439, IC244881, H-89-12, ICPL-283-23 (<113.00)
	Warangal	2005	II	123.0 - 239.0	Pusa-84 P31, IC245312, IC244954, IC245487, IC245323, IC245018 (<126.00)	GT-100 (140.67)
	Durgapura	2006	I	132.0 - 192.0	IC490841, IC490257 IC490710, IC490867, KP-5364 (<137.00)	Pusa-2001 (152.00)
	Hisar	2006		122.0 - 163.0	IC244953, AL-1363-4, IC245035, IC000070, IC245230(<129.00)	Pusa-2001 (134.00)
Pooled over locations	2004	I	111.6- 199.0	IC245541, IC245534, IC245538, IC245539, IC245540 (<114)	P33 (127.0)	
		II	127.0- 195.8	NONE	P33 (127.0)	
	2005	I	175.8- 219.0	NONE	ICPL87 (175.83)	
		II	121.67- 231.0	IC245439, IC245323, IC244879, Pusa-84 P31, IC245315 (< 124)	G101 (156.06)	
	2006		104.43- 192.29	IC490837, IC245307, IC245161, IC245300, IC245074 (< 131)	Pusa 2001 (133.36)	
No. of primary branches per plant	Badnapur	2004	I	2.0 - 23.6	IC73326, IC73117, IC73316, IC73336, IC73327 (>18.50)	P992 (9.37)
			II	2.3 - 20.7	IC74019, ICP7068, IC299046, IC299033, IC299047 (>18.50)	P992 (9.37)

No. of primary branches per plant	Bangalore	2004	I	4.0 - 20.0	IC073896, IC073786, IC073743, IC073336 (>19.8)	UPAS 120 (6.40)
		2005	I	1.8 - 24.1	IC043539, IC490458, IC508336, IC490554, IC490618, IC508332 (>12.80)	ICPL-87119 (9.21)
		2006			1.00 - 5.20	IC490714, IC490765, ICP-10960, IC490473, Frazalpur-7 (>4.00)
	Coimbatore	2004	I	1.8 - 17.0	IC73783, IC73343, IC73319, IC73312, IC73324, IC73336 (>13.20)	P33 (11.0)
			II	2.4 - 17.3	ICP 7068, IC299073, ICP 6877, IC74061, ICP 7059, ICP 4007 (>15.9)	P33 (11.0)
		2005	I	2.20 - 22.0	IC015713, IC056084, IC056078, IC016193-1, IC015716 (>17.20)	ICPL-87119 (11.0)
		2006			4.00 - 22.00	IC490594, IC139704, IC139719, IC490869, DCB-1177 (17.00)
	Kanpur	2004	I	1.0 - 18.50	IC245533, IC73309, IC73884, IC73862, IC73883 (>16.3)	UPAS120 (9.95)
			II	1.0 - 18.6	IC74060, IC73935, IC74123, IC73974, IC74062 (>15.8)	UPAS120 (9.95)
		2005	I	1.00 - 2.00	EC100465, EC100466, IC014984 (>2.00)	G-101 (1.33)
		2006			1.00 - 7.00	IC490495, IC490954, IC490944, IC490746, IC490594, IC490850 (>=5.00)
	Ludhiana	2004	I	3.0 - 21.0	IC245557, IC245518, IC245520, IC245540, IC245539 (>19.90)	UPAS120 (11.00)
		2006			3.00 - 9.00	IC245061, IC244969, IC245207, IC245230, IC245083, IC245140 (>7.00)
	Rahuri	2004	I	5.67 - 31.33	IC73898, IC73881, IC73315, IC73792, IC73791 (>28.50)	UPAS120 (13.91)
		2005	I	3.00 - 22.30	IC490485, IC490650, IC490640, IC490767, IC022502 (>18.00)	GT-100 (11.73)
	Varanasi	2004	I	5.80 - 23.10	IC73323, IC245287, IC73342, IC73339, IC73343 (>21.2)	P33 (14.7)
			II	4.50 - 21.20	ICP4376, ICP4392, IC74009, IC74099, ICP8109 (>19.40)	P33 (14.7)
		2005	I	6.3 - 23.2	IC508332, IC47217, IC490525, IC015704-1, IC056068 (>20.70)	ICPL-87119 (13.41)
			II	3.3 - 23.5	IC139657, NIC-23572, IC208401, IC139615, IC139769 (>21.00)	ICPL-87119 (15.33)
		2006			2.60 - 29.00	IC139590, IC508335, IC508329, IC508289, IC508309, IC028206 (>19.90)

No. of primary branches per plant	Warangal	2005	II	1.00 - 17.00	IC490558, IC490538, IC490624, IC490741, IC490575 (>16.00)	GT-100 (11.00)
	Durgapura	2006		1.00 - 8.00	IC490582, IC490563, IC490691, Frazalpur-7 (>7.00)	Pusa-2001 (4.36)
	Hisar	2006		3.00 - 19.00	IC245140, IC245266, IC245267, IC245152, IC245276 (>15.00)	Pusa-992 (10.00)
	Pooled over locations	2004	I	5.9-17.0	IC73343, IC73324, IC73342, IC73331, IC73332 (> 15.4)	P33 (10.4)
			II	5.9-14.1	IC73974, ICP7068, IC299033, ICP6877, ICP8117 (> 13.1)	P33 (10.4)
		2005	I	5.0-14.9	IC490650, IC043539, IC025053, IC490485 (> 14)	ICPL87119 (8.9)
			II	5.55-18.5	NIC23572, IC208407, IC139657, IC208401, IC139769 (> 17)	ICPL87119 (13.4)
		2006		3.66-12.20	IC139590, IC490944, IC490594, IC490503, IC490689 (> 8.92)	Pusa 992 (6.30)
No. of pods per plant	Badnapur	2004	I	5.00 - 102.50	IC245513, IC245488, IC245268, IC245190, IC245317(>97.50)	P992 (45.69)
			II	11.0 - 144.0	ICP6766, IC299030, ICP7059, ICP6850, ICP7046 (> 126.00)	P992 (45.69)
	Bangalore	2004	I	7.50 - 173.80	IC073734, IC245279, IC073115, IC073871, IC245198 (>146.8)	UPAS 120 (69.20)
		2005	I	12.8 - 270.3	IC490520, IC015702, IC015706, IC016194, IC022531 (>195.00)	ICPL-87119 (89.34)
		2006		2.70 - 329.25	IC490527, PLA-475-1, IC490497, IC508346, IC139665 (>195.00)	Pusa-2001 (39.18)
	Coimbatore	2004	I	9.6 - 242.0	IC44871, IC73843, IC245236, IC245552, IC73810 (>145.00)	P992 (130.0)
			II	6.0 - 152.0	ICP 4631, ICP 7046 (>149.95)	P992 (130.0)
		2005	I	23.0 - 533.2	IC056093, IC056065, IC056084, IC056092, IC056088 (>408.00)	G-101 (82.0)
		2006		32.0 - 680.0	IC490478, IC490505, IC139739, IC490475, IC139590 (>523.90)	-
	Kanpur	2004	I	2.0 - 196.0	IC245244, IC245231, IC245140, IC245540 (>145.00)	UPAS120 (95.27)
			II	2.0 - 220.0	IC74015, IC74036, IC74043, IC74012 (>95.00)	UPAS120 (95.28)
		2005	I	118.0 - 775.0	IC490447, IC023667, IC490723, IC490612, IC490428 (>225.00)	ICPL-87 (189.33)
		2006		20.0 - 151.0	IC248944, IC245238, IC028206, IC245149, IC244969 (>137.00)	-

No. of pods per plant	Ludhiana	2004	I	28.0 - 168.0	IC245425, IC245538, IC245430, IC245227, IC245486 (>143.00)	P33 (102.67)
		2006		30.0 - 120.0	AL-1360-1, IC245140, IC245173, IC245260 (>94.00)	Pusa-992 (65.00)
	Rahuri	2004	I	27.5 - 62.0	IC73791, IC73115, IC73315, IC45768, IC73318 (>537.00)	P33 (141.54)
		2005	I	8.0 - 356.0	IC052940, IC047259, IC028809, IC056069, IC056056 (>280.00)	ICPL-8711 (129.37)
	Varanasi	2004	I	25.3 - 236.5	IC73549, IC245386, IC73357, IC73720, IC245490 (>174.20)	P33 (106.4)
			II	18.6 - 173.2	IC74049, IC74099, IC74174 (>170.00)	P33 (106.4)
		2005	I	8.8 - 177.3	IC025053, IC015723-1, IC490490, IC025061, IC508319 (>121.60)	ICPL-87119 (48.20)
			II	3.33 - 195.33	IC139657, NIC-23937, IC139761, NIC-23936, IC139652 (>152.00)	ICPL-87119 (47.33)
		2006		10.70 - 8.50	IC056054, IC490706, IC201050, NIC-23934, IC508324 (>57.00)	Pusa-991 (26.38)
	Gulbarga	2005	II	10.0 - 179.0	IC245325, IC245551, IC245511, IC245447, IC245504 (>139.00)	ICPL-87119 (111.2)
	Warangal	2005	II	4.0 - 287.0	NIC-23554, NIC-23558, IC245286, IC490723, NIC-18575 (>264.00)	ICPL-87119 (115.6)
	Durgapura	2006	I	13.0 - 99.0	IC490585, IC139711, IC490619, IC490691, IC490557 (>94.00)	Pusa-991 (58.91)
	Hisar	2006		14.0 - 265.0	IC245037, IC245140, IC245266, IC245075, IC245276 (>244.00)	Pusa-991 (121.00)
	Pooled over locations	2004	I	46.7- 160.1	IC73318, IC45768, IC73315, IC73115, IC44871 (>144.1)	P33 (90.2)
			II	24.6- 102.0	IC74015 (= 102.0)	P33 (90.2)
2005		I	63.2- 215.5	IC490447, IC056065, IC056066, IC015702, IC056084 (> 170)	ICPL87119 (99.480)	
		II	32.47- 251.00	NIC23578, IC139635, IC139645, IC139639, IC139657 (> 184.42)	ICPL87119 (68.65)	
2006			29.67- 209.00	IC139739, IC490505, IC490475, IC490478, IC490527 (> 143.14)	Pusa 991 (58.39)	
Number of seeds per pod	Badnapur	2004	I	2.70 - 4.30	IC245445, IC245244, IC245221, IC245204, IC73339 (=4.30)	UPAS 120 (3.35)
			II	2.70 - 4.30	ICP6766, ICP7089, IC74060, IC74160, ICP4340 (=4.30)	UPAS-120 (3.35)

Number of seeds per pod	Bangalore	2004	I	3.50 - 4.50	IC245445, IC073765, IC245273, IC245245, IC245184 (>4.30)	UPAS 120 (4.10)
		2005	I	2.00 - 4.80	IC022538, IC016191, IC015708, IC014994, IC028192, IC15720-1 (>4.20)	ICPL-87119 (3.77)
		2006			2.00 - 5.00	IC245037, IC245244, IC245161, IC245258, IC245274(=5.00)
	Coimbatore	2004	I	1.90 - 6.40	IC73117, IC245304, IC245143, IC245178, IC245221, IC245354 (>4.30)	P992 (4.0)
			II	2.40 - 4.50	IC74092, ICP 6728 (>4.20)	P992 (4.0)
		2006			3.00 - 5.00	IC014991, IC490504, IC139585, IC014670, IC014987 (>3.00)
	Kanpur	2004	I	0.51 - 10.8	IC73775, IC73738, IC73777, IC245184, IC73931 (>4.6)	P33 (2.87)
			II	0.42 - 4.80	ICP 4374, IC73983, IC74168, IC74073, IC74009 (>4.50)	P33 (2.87)
		2005	I	3.00 - 5.00	IC015706, IC015705-1, IC056080, IC015711, IC022527 (=4.5)	ICPL-87 (3.50)
		2006			3.00 - 5.00	IC490869, IC490619, IC490616, IC490648, IC117593 (=5.00)
	Ludhiana	2004	I	2.50 - 4.60	IC245135 (>4.3)	P33 (3.57)
		2006			3.00 - 3.90	IC244964, IC245036, IC244953, IC245149, IC245267 (>3.60)
	Rahuri	2004	I	2.80 - 5.00	IC245344, IC245219, IC245342, IC245181 (>4.60)	UPAS120 (4.03)
		2005	I	1.10 - 4.20	IC490675, IC508272, IC015719-1, IC490664 (>4.0)	G-101 (3.37)
	Varanasi	2004	I	2.00 - 4.00	IC245542, IC245498 (>3.9)	UPAS120 (3.5)
			II	2.60 - 4.00	IC299066 (>3.9)	UPAS120 (3.5)
		2005	I	2.20 - 5.80	IC015720, IC508338, IC034151, IC047214, IC056094 (>4.60)	ICPL-87 (3.31)
			II	2.15 - 3.80	IC245013, IC245011, IC139628, IC208402, IC245512, ICPL 86023 (>3.60)	G 101 (3.15)
		2006			2.08 - 3.63	IC201061, IC139582, IC490639, IC208423, FRAZALPUR-7 (>=3.50)

Number of seeds per pod	Warangal	2005	II	3.00 - 4.40	IC139628, IC245007, NIC23554, NIC23558, Sel-90306 (≥ 4.00)	ICPL-87119 (3.92)
	Durgapura	2006		2.00 - 6.00	IC490585, IC490557, IC490505, IC490943, IC490689 (> 5.90)	Pusa-991 (4.27)
	Hisar	2006		3.10 - 3.90	IC244964, IC245266, IC245300, IC245267, IC245149 (> 3.00)	Pusa-992 (3.45)
	Pooled over locations	2004	I	2.9-4.3	IC73775, IC73315, IC73117, IC73931, IC245387 (> 3.8)	P33 (3.6)
			II	2.5-4.0	ICP6358, IC73976, ICP6674, ICP681, ICP4353, IC74032 (> 3.8)	P33 (3.6)
		2005	I	2.8-4.2	IC015720, IC490514, IC022531, IC016191, IC022552, IC056079, IC016208-1 (> 3.8)	G101 (3.75)
			II	2.65-4.00	NIC23578, IC139635, IC139645, IC139639 (= 4)	ICPL87119 (3.62)
2006		2.89-4.41	IC139748, IC490505, IC139758, IC490619, IC490873 (> 4.09)	Pusa 992 (3.60)		
Pod bearing branch length (cm)	Badnapur	2004	I	14.5 - 142.0	IC245141, IC73845, IC73898, IC73906, IC245137 (> 128.00)	UPAS 120 (57.98)
			II	29.0 - 105.0	IC74035, IC74156, IC73961, IC74014, IC74013 (> 97.00)	UPAS-120 (57.98)
	Bangalore	2004	I	11.5 - 159.0	IC073315, IC073773, IC073880, IC073887, IC073886 (> 95.50)	UPAS 120 (54.10)
		2005	I	22.0 - 153.0	IC056088, IC016196, IC056094, IC094672, IC022502 (> 143.00)	ICPL-87119 (84.50)
		2006		10.0 - 95.0	IC490701, IC490556, IC490426, NIC-23556, IC490588 (> 84.50)	Pusa-2001 (33.42)
	Coimbatore	2004	I	14.0 - 93.4	IC73752, IC73855, IC73815, IC73754, IC73720 (> 76.00)	P33 (59.40)
			II	18.2 - 93.3	ICP 3979, IC74124, ICP 6687, ICP 7075, ICP 6831 (> 87.00)	P33 (59.4)
		2005	I	34.8 - 152.9	IC015705-1, IC490519, IC490565, IC047226, IC056065 (> 135.5)	ICPL-87119 (102.3)
		2006		22.3 - 180.5	IC490532, IC056060, IC208400, IC201051, IC022500 (> 136.00)	-
	Kanpur	2004	I	24.25 - 143.0	IC73341, IC73343, IC73818, IC73907, IC73856 (> 119.50)	P33 (64.40)
			II	22.0 - 180.0	IC299026, ICP 2711, IC299061, IC299088, ICP4909, IC74015 (> 119.50)	P33 (64.41)
		2005	I	32.0 - 100.0	IC015711, IC038676, IC028209, IC490791, IC014991, IC28808 (> 99.00)	GT-100 (77.33)
		2006		16.0 - 91.0	IC139729, ICPL-0004, IC490756, IC490915, IC028199 (> 82.50)	-

Pod bearing branch length (cm)	Ludhiana	2004	I	10.0 - 49.0	IC245319, IC245518, IC245322, IC245130, IC245201, IC245317 (>38.5)	UPAS120 (26.00)
		2006		14.0 - 31.0	IC244952, IC245074, IC245152 (>29.50)	Pusa-992 (23.00)
	Rahuri	2004	I	18.6 - 93.22	IC73926, IC73740, IC73851, IC73782, IC73874 (>80.00)	P33 (54.39)
		2005	I	6.60 - 65.60	IC490632, IC490550, IC490633, IC490697, IC490667 (.54.00)	G-101 (28.92)
	Varanasi	2004	I	10.80 - 59.70	IC73720, IC245386, IC73331, IC73875, IC73894 (>43.20)	P992 (28.90)
			II	15.10 - 51.30	IC74027, ICP4100, IC299025, IC299064, ICP8109 (>46.00)	P992 (28.90)
		2005	I	8.30 - 201.50	IC022528, IC015708-1, IC016206, IC508301, PLA-281-2 (>77.60)	G-101 (21.76)
			II	8.58 - 54.00	IC490844, IC490518, IC245425, IC245286, IC245345 (>42.30)	GT-100 (20.66)
		2006		12.10 - 57.95	IC490850, IC028203, IC508323, IC508333, IC056055, IC508292 (>43.90)	Pusa-991 (26.87)
		Gulbarga	2005	II	37.0 - 183.0	IC139710, IC139784, IC139725, IC139625, IC139685 (>164.00)
	Warangal	2005	II	8.58 - 54.00	IC139786, IC139622, IC490590, IC248949, AL944-2 (>6.25)	ICPL-87 (5.93)
	Hisar	2006		17.0 - 38.0	ICPL-00079, IC244874, FRAZALPUR -7, IC245271, SP-2-2 (>34.80)	Pusa-992 (31.50)
	Pooled over locations	2004	I	24.2-74.3	IC73901, IC73845, IC73315, IC73898, IC73341 (>68.6)	P33 (46.8)
			II	34.2-75.6	IC299026, IC74013, IC74014, IC73937, ICP3979 (> 66.7)	P33 (46.8)
2005		I	36.5-92.6	IC022528, IC022531, EC100467, IC016206, PLA-281-2 (> 75.8)	ICPL87119 (60.3)	
		II	4.38-72.03	IC139784, IC490568, IC139710, IC490844 (> 70)	ICPL87119 (59.2)	
2006			23.94-76.20	IC490532, IC208400, IC139729, IC490606, IC139739 (> 71.12)	Pusa 992 (27.01)	
Plant height (cm)		Badnapur	2004	I	37.0 - 190.7	IC73758, IC245386, IC73763, IC73750, IC73757 (>183.9) (Tall) IC245183, IC245221, IC245501, IC245184, IC245198 (<70.00) (Dwarf)
			II	111.3 - 179.3	IC74088, IC299060, ICP6645, IC299047, IC74060, ICP 6627 (>169.50) (Tall) IC74058, IC74068, IC74072, IC74141, IC74092 (<115.00) (Dwarf)	P992 (138.62) UPAS-120 (138.58)

Plant height (cm)	Bangalore	2004	I	43.3 - 263.0	IC073738, IC073313, IC073350, IC073340, IC073312 (>228.50) (Tall) IC245130, IC245183, IC245533, IC245468, IC245189 (<57.00) (Dwarf)	P992 (112.60) P33 (91.90)
		2005	I	63.4 - 236 -8	IC490469, IC490535, IC490791, IC490450, IC490843 (>228.00) (Tall) IC042172, IC032994, IC042174 (<74.00) (Dwarf)	ICPL-87119 (160.78) GT-100 (86.47)
		2006		25.0 - 173.3	IC490849, IC490556, IC490527, IC490701, IC490459 (>163.50)	Pusa-991 (64.12)
	Coimbatore	2004	I	39.0 - 204.5	IC73332, IC73334, IC73336, IC73850, IC73339 (>192.00) (Tall) IC245317, IC245130, IC245132, IC245181 (<48.00) (Dwarf)	P33 (110.80) UPAS120 (56.20)
			II	56.2 - 200.0	ICP 4370, ICP 3979, ICP 6878, ICP 801, ICP 4909 (>193.00) (Tall) (>194.00) None : Dwarf	P33 (110.8) UPAS120 (56.2)
		2005	I	66.3 - 283.6	IC490784, IC490449, IC490469, IC490650, IC490490 (>268.00) (Tall) None: Dwarf	ICPL-87119 (201.5)
		2006		83.7 - 298.3	IC139580, NIC-7261, IC490873, GB-124, IC490648 (>241.00)	-
	Kanpur	2004	I	76.6 - 258.0	IC73322, IC73339, IC73315, IC73336, IC73332 (>244.90) (Tall) IC245376, IC245351, IC245387, IC245220, IC245377 (<103.00) (Dwarf)	P33 (182.19) P992 (124.19)
			II	100.0 - 280.0	IC74130, ICP7075, ICP4909, ICP4948 (> 239.00) (Tall) ICP6677, IC299071, IC74092 (<115.5) (Dwarf)	P33 (182.19) P992 (124.19)
		2005	I	120.0 - 260.0	IC490474, IC490632, IC056079, IC490608 (>255.00) (Tall) IC023673, IC056084, IC056081, IC490596, IC490937 (<127.00) (Dwarf)	GT-100 (182.50) G-101 (176.83)
		2006		100.0 - 213.0	KP-5389, DCB-1061, IC244946, KP-5394, BDS-715 (>=200.00)	-

Plant height (cm)	Ludhiana	2004	I	97.0 - 221.0	IC245539, IC245520, IC245306, IC245540, IC245375 (>214.00) (Tall) IC245183, IC245181, IC245130, IC245221, IC245205 (<121.00) (Dwarf)	P992 (203.50) P33 (190.33)
		2006		128.0 - 158.0	IC245308, IC245230, IC245079, IC000070, IC245258 (>154.00)	Pusa-2001 (143.00)
	Rahuri	2004	I	41.7 - 322.6	IC73115, IC73880, IC73342, IC73334, IC73341 (>288.00) (Tall) IC245141, IC245183, IC245181, IC245184, IC245132 (<65.5) (Dwarf)	P33 (151.73) UPAS120 (123.33)
	Varanasi	2004	I	90.1 - 286.0	IC73339, IC73332, IC73788, IC73340, IC73336 (>279.00) (Tall) IC245183, IC245541, IC245229, IC245221, IC245220 (<127.00) (Dwarf)	P33 (210.1) P992 (188.6)
			II	133.6 - 284.8	IC299066, ICP6728, IC299072, ICP8109, IC299068 (>277.30) (Tall) ICP6668, IC299024, IC73941, IC73956, IC74109 (<177.00) (Dwarf)	P33 (210.1) P992 (188.6)
		2005	I	87.3 - 271.0	IC028193, IC508293, IC014996, IC490675, IC015704-1 (>229.80) (Tall) IC490488, IC490780, IC490586, IC028188, IC038706-1 (<115.5) (Dwarf)	ICPL-87119 (184.47) ICPL-87 (132.12)
			II	49.83 - 230.83	IC139583, IC139753, IC139664, IC139581, IC139657 (>226.00) (Tall) IC348274, KP-5330, SEL-83034, IC245486, IC245322 (<97.00) (Dwarf)	ICPL-87119 (181.36) ICPL-87 (114.27)
		2006		82.2 - 209.6	IC490257, IC490651, IC508329, IC490446, IC490954 (>197.00)	Pusa-991 (142.66)
	Gulbarga	2005	II	77.0 - 295.0	IC139628, IC009144, IC490483, IC490797, IC490518 (>244.00) (Tall) Sel.296-2, IC245509, IC245363, IC245512 (<113.00) (Dwarf)	ICPL-87119 (219.6) ICPL-87 (112.4)
	Warangal	2005	II	78.0 - 260.0	IC490776, IC245348, IC490662, IC139602, IC139573 (>227.4) (Tall) IC244914, IC245150, IC245534, IC245363 (<90.00) (Dwarf)	G-101 (157.92) ICPL-87 (105.14)

Plant height (cm)	Durgapura	2006		47.50 - 198.90	IC490557, IC508333, IC056060, IC508292, IC056062 (>195.80)	Pusa-2001 (137.38)
	Hisar	2006		108.00 - 253.00	IC245269, P-942-2, IC245140, IC244874, IC244953 (>247.80)	Pusa-2001 (219.00)
	Pooled over locations	2004	I	70.6-277.5	IC73339, IC73313, IC73340, IC73336, IC73334 (> 219) (Tall)	P33 (153.7)
			II	136.2-212.9	IC245183, IC245221, IC245184, IC245130, IC245205 (< 106) (Dwarf)	UPAS120 (140.5)
		2005	I	122.3-241.0	ICP7075, ICP4909, ICP3373, IC299066, ICP6878 (> 200) (Tall)	P33 (153.7)
			II	106.28-222.62	ICP6668 (= 136.2) (Dwarf)	UPAS120 (140.5)
		2006	I	122.3-241.0	IC490469, IC490535, IC490449, IC490490, IC490650 (> 221.62) (Tall)	ICPL87119 (181.94)
			II	106.28-222.62	NONE (Dwarf)	GT 100 (122.30)
		2005	I	122.3-241.0	IC490662, IC139581, IC490776, IC139601, IC139583 (>215.58) (Tall)	ICPL87119 (168.7)
			II	106.28-222.62	IC245363, IC245486, PUSA-987, IC245517, IC244899 (< 114.8) (Dwarf)	GT100 (134.8)
2006			109.21-176.98	IC490556, IC490820, IC490527, IC490537, IC490548 (> 173.82)	Pusa 2001 (137.79)	
Seed yield per plant (g)	Badnapur	2004	I	0.3 - 50.0	IC73347, IC73321, IC73810, IC73312, IC73849 (>47.00)	P992 (7.88)
			II	0.8 - 77.9	IC74000, IC73939, IC74062, IC73936, ICP677 (>40.00)	P992 (7.88)
	Bangalore	2004	I	4.9 - 39.4	IC245198 (>39.40)	P992 (15.90)
		2005	I	18.0 - 271.0	IC022531, IC015706, IC028188, IC508287, IC015702 (>182.00)	ICPL-87119 (76.17)
		2006		0.10 - 8.60	IC490527, IC139720, IC508346, IC490714, IC490497 (>6.00)	Pusa-992 (3.51)
	Coimbatore	2004	I	8.0 - 56.0	IC44871, IC73843 (>48.00)	P33 (48.0)
			II	10.0 - 48.0	None	P33 (48.0)
		2005	I	2.0 - 83.4	IC056065, IC034151 (>81.00)	ICPL-87119 (79.8)
		2006		15.0 - 122.0	IC016195, IC139577, IC139580, IC117587, IC139590 (>102.00)	-
	Kanpur	2004	I	0.33 - 39.2	IC245244, IC73312, IC73332, IC245236, IC245237 (>26.90)	UPAS120 (18.39)
			II	0.40 - 110.60	IC74166, IC73962, IC74036, IC74075, ICP4374 (>28.00)	UPAS120 (18.39)

Seed yield per plant (g)	Kanpur	2005	I	12.0 - 55.0	IC047231, IC490535, EC100465 (>49.00)	ICPL-87119 (25.00)
		2006		5.00 - 41.00	IC490516, DNM-13, KP-5371, IC249727, KP-5336 (>29.00)	-
	Ludhiana	2004	I	2.30 - 19.30	IC245187, IC245178, IC245538, IC245540, IC245198 (>18.00)	UPAS120 (13.92)
		2006		3.40 - 15.00	IC245207, AL-1357-2, IC245044, IC245076, IC245260 (>12.00)	Pusa-992 (7.70)
	Rahuri	2004	I	4.0 - 84.0	IC73331, IC44871, IC73870, IC245342, IC73791 (>59.90)	UPAS120 (17.79)
		2005	I	0.1 - 9.3	IC047248, IC056056, IC490456, IC490718, IC052940 (>7.00)	ICPL-87119 (3.22)
	Varanasi	2004	I	3.2 - 78.3	IC245532, IC73349, IC245135, IC73720, IC73357 (>34.90)	UPAS120 (21.6)
			II	5.2 - 96.0	IC74089, ICP1223, IC73954, IC74053, IC74099 (>37.00)	UPAS120 (21.6)
		2005	I	3.0 - 96.2	IC490488, IC490595, IC490831, IC490641, IC490525 (>16.50)	T-100 (8.86)
			II	2.66 - 32.16	H-89-12, NIC-23590, IC201069, IC139686, IC139689 (>26.00)	ICPL-87119 (9.20)
		2006		3.30 - 14.50	IC056054, IC056060, IC490606, IC508309, IC508324 (>13.00)	Pusa-991 (6.30)
	Gulbarga	2005	II	0.8 - 52.8	TRA-126/84-21, IC000095, IC244903, IC009144, ICPL-88001 (>31.00)	ICPL-87119 (30.32)
	Warangal	2005	II	0.41 - 63.20	IC201067, NIC-23577, IC201064, IC139688, IC139686 (>57.40)	ICPL-87119 (33.95)
	Hisar	2006		5.20 - 14.40	IC245207, IC245044, AL-1357-2, IC245076, IC245260 (>12.40)	Pusa-991 (8.50)
Pooled over locations	2004	I	7.4-31.0	IC73331, IC73312, IC73347, IC73315 (> 24.6)	P33 (17.5)	
		II	5.6-37.7	IC74166, IC74000, IC74089, IC73939 (> 25.5)	P33 (17.5)	
	2005	I	10.3-106.0	IC022531, IC015706, IC022551, IC023683, IC015702 (> 52.00)	ICPL87119 (38.38)	
		II	3.51-45.68	IC139645, IC139659, IC201067, IC139667, IC139686 (> 32.32)	ICPL87119 (16.45)	
	2006		4.53-35.46	IC139577, IC117587, IC016195, IC139580, IC139593 (> 32.02)	Pusa 992 (6.15)	
100-Seed weight (g)	Badnapur	2004	I	5.5 - 12.5	IC73796, IC73918, IC73810, IC73743, IC73776, IC73924 (>10.5)	P33 (8.02)
			II	6.0 - 11.0	IC74044, IC74114, ICP4374 (>10.5)	P33 (8.02)
	Bangalore	2004	I	6.0 - 13.0	IC073910, IC073876, IC073750, IC073760 (>12.00)	P33 (8.70)
		2005	I	4.00 - 16.00	IC014996, IC508287, IC015704-1, IC023667, IC038674, EC100465, IC22555 (>13.00)	ICPL-87119 (12.67)

100-Seed weight (g)	Bangalore	2006		4.85 - 22.60	IC028208, D-379, IC094681, IC094682, IC139580 (>15.00)	Pusa-2001 (8.99)
	Coimbatore	2004	I	5.91 - 12.99	IC73796, IC73345, IC73321, IC245237, IC73323 (>12.00)	UPAS120 (9.42)
			II	2.17 - 14.45	ICP 4803, IC299067, IC74114, IC74160, IC74164 (>13.90)	UPAS120 (9.42)
		2005	I	4.2 - 13.1	None	G-101 (13.1)
		2006		6.00 - 11.20	IC201059, IC201060, KP-5389, IC490676, IC139579 (>10.5)	-
	Kanpur	2004	I	2.3 - 17.12	IC245445, IC245221 (>11.00)	P992 (8.89)
			II	3.8 - 10.3	IC73995, IC73998, IC73941, IC73934, ICP4987 (>9.00)	P992 (8.89)
		2005	I	3.7 - 12.9	IC490559, EC100465, EC100467, IC022523, IC022521 (>11.00)	ICPL-87119 (9.28)
		2006		2.68 - 16.88	IC201065, IC490491, IC208400, IC490746, IC490497 (>15.00)	-
	Ludhiana	2004	I	5.90 - 9.50	IC245552, IC245275, IC245220, IC245345, IC245352 (>=9.00)	P992 (8.42)
		2006		6.00 - 9.00	IC244952, ICPL-00004, IC245258, IC245199, IC245300, IC245230 (>8.00)	Pusa-991 (8.00)
	Rahuri	2004	I	6.57 - 12.80	IC73899, IC73718, IC73858, IC73887, IC73356 (>12.40)	P992 (9.02)
		2005	I	1.2 - 17.1	IC490656, IC490727, IC022543, IC490546 (>15.00)	ICPL-87119 (9.07)
	Varanasi	2004	I	1.8 - 13.2	IC73764, IC245386, IC73852, IC73876, IC73776 (>12.00)	P992 (9.9)
			II	4.60 - 13.20	IC73995, ICP7059, ICP2711, ICP245, IC299019 (>11.5)	P992 (9.9)
		2005	I	4.90 - 12.80	IC047215, IC014989, IC022520, IC014996, IC015718 (>12.00)	GT-101 (9.46)
			II	5.6 - 12.6	IC490875, IC139761, IC490575, NIC-23590, IC139676 (>12.00)	ICPL-87119 (9.16)
		2006		4.00 - 11.60	IC490791, IC139713, IC490610, IC139707, IC201772 (>10.30)	Pusa-991 (7.32)
	Gulbarga	2005	II	5.59 - 12.77	IC245345, IC245348, IC245016, IC000185, IC245363 (>11.80)	ICPL-87119 (10.822)
Warangal	2005	II	4.0 - 20.8	IC139635, IC490568, IC139780, NIC 23578, IC139657 (>12.50)	GT-101 (12.04)	
Durgapura	2006		2.50 - 8.80	IC508357 IC490689, IC139711, IC490648, IC490943 (>8.00)	Pusa-991 (5.61)	
Hisar	2006		6.20 - 9.00	IC244952, IC245300, ICPL-00004, IC245308, IC245199 (>8.65)	Pusa-991 (8.60)	

100-Seed weight (g)	Pooled over locations	2004	I	7.0-11.0	IC73796, IC73876, IC73836, IC73764, IC73718 (> 10.1)	P992 (8.7)
			II	5.6-11.4	IC73995, IC74114, ICP6656, IC73939, ICP2711 (> 9.8)	P992 (8.7)
		2005	I	6.2-10.9	EC100467, EC100465, IC023673, IC016208-2 (>10.5)	G101 (10.4)
			II	6.17-20.80	IC139635, NIC23578, IC490568, IC139757, IC490875 (> 11)	ICPL87 (10.31)
		2006		6.08-12.03	D-379, IC490512, IC201060, IC208400, IC139579 (> 9.85)	Pusa 991 (7.65)
Biotic Stress						
Wilt	Bangalore	2004	I		IC245130, IC245131, IC245132, IC245134, IC245135 (node 1)	
	Badnapur		II		IC73953, IC73960, IC73962, IC73969, IC73972 (node 1)	
		2005	II		IC139639, IC139698, IC245012 (node 1)	
		2006			IC014670, IC201059 (node 1)	
	Dholi	2004	I		IC245198, IC245344, IC245351, IC245352, IC245354 (node 1)	
		2005	I		IC016210-2, IC042174, IC508269, IC508272, IC508273 (node 1)	
		2006			IC022500, NIC-23579, IC248939 (node 1)	
	Rahuri	2004	II		IC74119, IC74121, IC74122 (node 1)	
	Gulbarga	2005	I		IC508320, ICPL-87119 (node 1)	
	Pooled over location	2004	I		IC73727, IC73735, IC73321, IC73726, IC73832 (node 1)	
			II		IC73995, IC73972, IC73975, IC73993 (node < 4)	
		2005	I		ICPL87119 (node 1)	
			II		ICPL87119, IC245302 (node 2)	
	2006			IC014670, IC201059, IC022500, NIC-23579, IC248939 (<6.67)		
	SMD	Bangalore	2004	I		IC245198, IC245219, IC45768, IC73115, IC73312 (node 1)
2005			II		IC139583, IC139596 (node 1)	
Badnapur		2004	I		IC245131, IC245136, IC245156, IC245187, IC245196 (node 1)	
		2005	I		EC100465, IC014984, IC014989, IC014992, IC014994 (node 1)	
		2006			NIC-23579, IC248939, IC244946, IC245191, KP-5389 (node 1)	
Dholi		2005	II		IC139581, IC139583, IC139583-1, IC139595, IC139596 (node 1)	
		2006			NIC-23579, IC248939, IC441599 (node 1)	
Durgapura		2005	II		IC490903, IC490888, IC490542, IC490762, IC508354 (node 1)	

SMD	Pooled over location	2004	I		IC245198, IC45768, IC73313, IC73332, IC73336 (node 1)	
			II		IC73947, IC74126, IC74084, IC74107, IC7413 (node < 4)	
		2005	I		IC016200-1, IC022555, IC028806, IC014989, IC014992 (node 1)	
			II		IC139583-1 (node 2)	
		2006			NIC-23579, IC248939 (node 1)	
Quality						
Protein (%)	NBPGR, Delhi	2004	I	16.63 - 21.50	IC73781, IC73334, IC245543, IC73321, IC73905 (>20.00%)	-
			2005	I	16.34 - 22.61	IC490670, IC490750, IC490492, IC508321, IC508276 (>22.12%)
		II		16.98 - 23.75	IC208420, IC015711, IC208422, IC060318, IC208424 (>22.65%)	ICPL-87 (20.22)

Remarks : node I = < 10% infection (Highly resistance)