



Characterization of ICRISAT-bred Pearl Millet Restorer Parents



International Crops Research Institute
for the Semi-Arid Tropics

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2015

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Foreword

Pearl millet is an important cereal crop in the arid and semi-arid regions of Asia and Africa where it is grown for food, feed and fodder. Increased and stable production of pearl millet is essential for the well-being of millions of people living in these marginal regions.

ICRISAT has a global mandate to conserve the genetic resources of pearl millet and enhance its productivity in Asia and Africa. This is done through collaborative research with multiple partners in the national agriculture research systems, advanced research institutes, private sector, and non-governmental organizations.

ICRISAT aligned its research strategy for pearl millet with the regional priority of developing improved breeding lines and hybrid parents in Asia. Pearl millet productivity in India has increased from 400-500 kgs per ha in 1960s to the present levels of about 1.2 tons per ha due to the success of hybrid technology. There has been extensive use of ICRISAT-bred seed parents (A/B lines) and restorers (R lines) by both National Agricultural Research Systems and the private seed companies. In view of the increased use of ICRISAT-bred parental lines and awareness on protecting these lines under Intellectual Property Rights (IPR), a need has been felt to characterize and place them in public domain as international public goods (IPGs). This would enhance ICRISAT's ability to protect these materials from any possible infringement, and allow unhindered access to it by public organizations globally.

Working in this direction, ICRISAT has already characterized and documented 99 A/B lines which were developed during the period 1981-2004. The breeding program for the development of restorer parents runs parallel to the seed parent development program and about 1,731 restorer lines were developed and designated during 1985–2008. These lines were disseminated as potential hybrid parents after evaluation for agronomic performance and resistance to downy mildew, the most damaging disease of pearl millet in India.

Although individual lines were evaluated in the years they were developed and designated, they have not been evaluated for a comprehensive set of morphological traits in common environments until now. Thus, the objective of the present study was to characterize



promising restorer lines using morphological traits developed for Distinctness, Uniformity and Stability (DUS) - test.

This publication is part of ICRISAT's commitment to share knowledge on genetic resources to increase nutritional security together with our partners in hybrid development and seed production around the globe.

David Bergvinson
Director General, ICRISAT



Introduction

Pearl millet [*Pennisetum glaucum* (L) R. Br.], primarily grown for grain production on more than 26 m ha in the arid and semi-arid tropical (SAT) regions of Asia and Africa, is a highly nutritious cereal crop with wide agro- ecological adaptation. India, the largest producer of this crop at the global level, cultivates pearl millet on about >9 million ha contributing to more than 90% area of the crop in the Asian region. It is a highly cross pollinated crop, and single-cross hybrids generally give 20-30% more yield than open pollinated varieties (Rai et al. 2006). With the availability of commercially exploitable cytoplasmic-nuclear male sterility (CMS) systems in pearl millet, the national agricultural research system (NARS) and the private seed sector in India focused their breeding programs on hybrid development. This led to the development and adoption of a diverse range and large number of hybrids (> 80 in 2011) and now occupying > 4.5 m ha area, which is about half the total pearl millet area being cultivated in India (Rai et al. 2006). ICRISAT also aligned its breeding program to developing promising hybrid parental lines in order to support the Asian pearl millet hybrid program.

There has been extensive use of ICRISAT-bred seed parents (A/B lines) and restorers (R lines) by both NARS and the seed companies in the private sector. For instance, 60-70% of the hybrids often included in the All India Coordinated Trials and released by both NARS and the private sector are based on ICRISAT-bred hybrid parents (Mula et al. 2007). In view of the increased use of ICRISAT-bred parental lines and awareness on protecting these lines under Intellectual Property Rights (IPR), a need has been felt to characterize and place them in public domain as international public goods (IPGs). This would enhance ICRISAT's ability to protect these materials from any possible infringement, and allow unhindered free access to it by public organizations globally. Working in this direction, ICRISAT has already characterized and documented 99 A/B lines which were developed during the period 1981-2004 (Rai et al. 2009) (<http://www.icrisat.org/what-we-do/publications/icrisat-publications-2010/morphological-pearlmillet.pdf>).

The breeding program for the development of restorer parents runs parallel to the seed parent development program and about 1731 restorer lines were developed and designated during 1985 – 2008. Most of the restorers have been bred using genotypes of Indian and African origin, following several methods such as pedigree selection, population



improvement, or pedigree bulk selection in introduced landraces or breeding materials, followed by inbreeding at ICRISAT, and also few entries among them have been obtained from national program partners. These lines were designated and disseminated as potential hybrid parents after evaluation for agronomic performance and resistance to downy mildew (caused by *Sclerospora graminicola*), the most dreadful disease of pearl millet in India. Although individual lines were evaluated in the years they were developed and designated, they have not been evaluated for a comprehensive set of morphological traits in common environments until now. Thus, the objective of the present study was to characterize 114 promising restorer lines using 26 morphological traits developed as DUS (Distinctness, Uniformity and Stability) descriptors as shown in Annexure I (AICPMIP 2006).

Materials and Methods

Plant material and field trials

In the pearl millet improvement program at ICRISAT, about 1731 pearl millet restorers are maintained in the ICRISAT Pearl Millet Pollinator Collection (IPMPC). These were designated an IPC (ICRISAT Pollinator Collection) number in order of their development in the breeding program at ICRISAT. These restorers were bred at ICRISAT using the ear-to-row method followed by their maintenance through bulking 10-15 phenotypically similar looking plants/season. All collection entries are being maintained in medium term cold storage at ICRISAT. Based on the information contained in a booklet Pearl Millet Pollinators: Description, Pedigrees and Distribution published by ICRISAT in 1995 (Talukdar et al. 1995), where 1704 restorers designated in the period 1985–1995 have been documented, 114 restorers identified as relatively more promising based on plant characteristics and diversity were selected for this study. These 114 restorers parents were

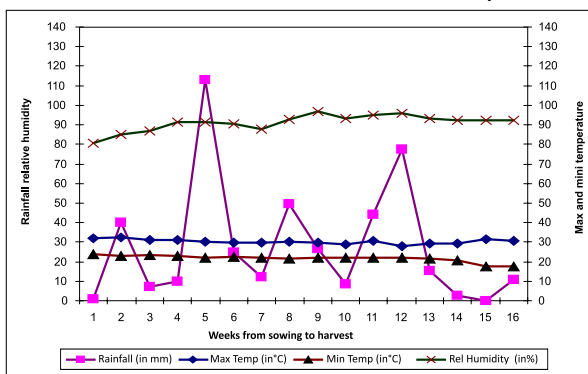


Fig 1. Weekly distribution of rainfall(mm), Maximum & Minimum temperature (°C) and relative humidity (%) during 2007 Rainy season.



planted in a randomized complete block design with two replications during the 2007 rainy season (Jul–Oct) and 2008 postrainy (dry) season (Mar–May) at ICRISAT, Patancheru (18°N lat. ; 78° E long.). During the rainy season, there was a total rainfall of 442.7 mm with the weekly mean maximum temperatures ranging between 28.1 and 31.9° C, weekly mean

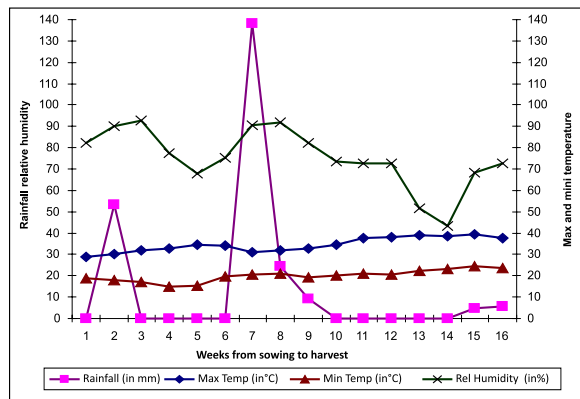


Fig 2. Weekly distribution of rainfall(mm), Maximum & Minimum temperature (°C) and relative humidity (%) during 2008 Post Rainy season.

minimum temperatures ranging between 17.4 and 23.7°C and relative humidity above 96% (Fig. 1). During the postrainy season, there was a total of 236.2 mm rainfall with the weekly mean maximum temperatures ranging between 28.8 and 39.4°C, weekly mean minimum temperatures ranging between 14.6 and 24.5°C and relative humidity > 92% (Fig. 2).

Each line was machine-planted in a single row of 4 m with 75 cm spacing between the rows in rainy season and 60 cm in postrainy season, and 15 cm spacing between the plants in both seasons. The experiment was conducted in alfisols with applied fertilizer levels of 80 kg ha⁻¹ N (18% basal and rest as top dressing) and 46 kg ha⁻¹ as P (basal dose). The standard cultural and agronomic practices were followed that included thinning and manual weeding at 15 days after sowing.

Data collection and analysis

The observations on nine quantitative traits were taken on 10 random plants in each plot for plant height (cm), panicle length (cm), panicle diameter (cm), number of productive tillers, number of nodes per plant, leaf sheath length (cm), leaf blade length (cm), leaf blade width (cm) and 1000-grain weight (g). Time to 50% flower was recorded on plot basis when the main panicles of 50% of the plants in the plots had full stigma emergence. Data were also taken on 16 other qualitative or quasi-qualitative traits.

These included seedling color, panicle exertion, panicle tip sterility, node pubescence, node pigmentation, internode pigmentation, leaf sheath

pubescence, anther color, glume pigmentation, presence/absence of bristles in panicle, and bristle color for which data were recorded on the basis of visual assessment of individual plants (or parts of plants) within a plot (VS); for traits such as plant growth habit, panicle shape, panicle density, seed color and seed shape it was based on visual assessment of group of plants (or parts of plants) in a plot (VG). The mean plot values of the quantitative traits measured were subjected to analysis of variance across the two seasons following randomized complete block design and using Genstat 10.1 software.

Results and Discussion

Germplasm base

In the pearl millet improvement program at ICRISAT, restorer lines (R-lines) are developed with considerable morphological and genetic diversity and then designated based on agronomic performance. The parentage of 114 designated restorer lines shows the utilization of a wide range of germplasm and improved lines in developing these R lines. For instance, 19 R-lines were directly selected from the germplasm accessions, and 11 were selected directly from composites (Table 1).

Table 1. Genetic diversification of 114 designated restorer parents of pearl millet at ICRISAT.

Germplasm base	No. of lines	Remarks	Genetic base (Code ¹)
Germplasm	19	Inbreeding and selection directly from germplasm	1
Composites	11	Includes composites and open pollinated varieties	2
Germplasm x Elite line crosses	8	Includes early generation breeding lines derived from germplasm	3
Composite x Elite line crosses	17	Includes early generation breeding lines derived from composites	4
Elite line x Elite line crosses	59	Includes crosses between advanced generation lines	5

¹Refer to Annexure II

In addition, 8 R-lines were derived from crosses that involved germplasm in their parentage and 17 lines had composites in their parentage. Thus, there were 55 restorer lines that had some components of germplasm and/or composite in their parentage, indicating apparently substantial usage of germplasm and composites in the development of these R-lines.



The remaining 59 R-lines were derived from crosses between elite inbred lines. Thus, while these 114 restorer lines have been developed utilizing diverse parents, they also share a large number of parental lines of common origin. For instance, 43 restorer lines had one of the parents developed from Jamnagar Research Station (depicted with 'J' prefix in the pedigree), while 32 restorer lines had one of the parents from Institute of Agricultural Research Millet Program, Kano, Nigeria (depicted as '700...' series as prefix) in their parentage. B282, a d_2 dwarf restorer obtained from Rockefeller Foundation Collection, originating from Bangkok was found in the parentage of about 14 restorer lines. Again, LCSN, a selection from ICRISAT Late Composite developed in Burkina Faso was present in the parentage of about 14 lines.

Quantitative traits

The overall mean of all the R lines for ten quantitative characters revealed significant effect of the season on plant height (148 cm in rainy; 134 cm in postrainy), days to 50% flowering (48 days in rainy; 50 days in postrainy), and for number of nodes per plant (8.9 in rainy; 8.3 in postrainy) (Table 2). There were significant differences among genotypes for all the quantitative traits under study which revealed the presence of significant genetic variability among the restorer lines. A wide range was observed for most of the characters based on the mean values over the two seasons (Table 3).

For instance, plant height ranged from 56 to 201 cm, 50% flowering from 43 to 61 days, panicle length from 10 to 40 cm and 1000-grain weight from 5.7 to 14.0 g. There were 6 genotypes with more than 3 tillers per plant while 5 genotypes had panicle diameter of more than 3.0 cm. Restorer lines such as ICMP 451 (IPC 107) and H77/833-2 (IPC 1466) which have been quite popular in pearl millet hybrid breeding programs were used as reference lines to classify the restorer lines for some specific traits. It was found that 21 restorer lines were in the same maturity group as the earliest flowering commercial restorer parent H77/833-2 (45 days). About 47 R-lines were in the same productive tiller group as of ICMP 451 (1.8 tillers per plant).

A maximum number of 27 R-lines were in the same panicle length group as ICMP 451 (23 cm), while 11 lines had panicle length of more than 25cm. There were 26 R-lines with similar panicle diameter as that of ICMP 451 (2.8 cm) while 5 lines had more than 3.0 cm of panicle diameter. The 1000-grain weight of 21 lines ranged 10.1-12 g similar to that of ICMP 451 (11.1g).



Table 2. Analysis of variance for 10 quantitative traits in pearl millet restorer lines evaluated at ICRISAT, Patancheru (2007 rainy season and 2008 post-rainy season).

Source of variation	d.f.	Mean square									
		DF	LSL	LBL	LBW	PL	PD	NNP	NPT	PHT	TGW
Season	1	466.7**	1.7NS	59.4NS	0.6NS	1.7NS	0.84NS	41.9*	0.13NS	19373.4*	2.1NS
Replication/ season	2	3	1	109.3	1.3	11.9	0.14	1.4	1.2	693.4	1.6
Genotype	113	48.7**	12.7**	165.3**	1.1**	76.6**	0.65**	2.1**	1.1**	1930.3**	15.3**
Genotype x season	113	11.2**	0.5**	20.3**	0.1**	2.2**	0.04*	0.5**	0.34**	179.1**	1.1**
Error	226	0.9	0.21	4.2	0.1	1.0	0.03	0.1	0.1	29.5	0.5

d.f. = Degrees of freedom; DF = Days to 50% flowering LSL = Leaf sheath length; LBL = Leaf blade length; LBW = Leaf blade width; PL = Panicle length; PD = Panicle diameter; NNP = Number of nodes per plant; NPT = Number of productive tillers/plant; PHT = Plant height; TGW = 1000-grain weight.

* = significant at 5%; ** = significant at 1%

Table 3. Frequency distribution of designated pearl millet restorer lines for agronomic traits evaluated at ICRISAT, Patancheru (2007 rainy season and 2008 post-rainy season).

Character	No. of R-lines in trait classes													Range	Reference R- line		
	Trait class	90.1-100	100.1-110	111.1-120	120.1-130	130.1-140	140.1-150	150.1-160	>160	56-201	ICMP 451	149.8					
Plant height (cm)	No. of lines	1	3	4	6	19	19	25	19	19	20						
	Trait class	<42	42.1-45	45.1-48	48.1-51	51.1-54	54.1-57	57.1-60	>60								
Time to 50% flowering (d)	No. of lines	-	21	31	35	20	8	1	-	-							
	Trait class	1	1.1-2	2.1-3	3.1-4	4.1-5	5.1-6	>6									
Number of productive tillers plant ⁻¹	No. of lines	-	47	63	5	1	-	-	-	-							
	Trait class	<15	15.1-20	20.1-25	25.1-30	30.1-35	>35										
Panicle length (cm)	No. of lines	9	68	28	10	-	1	-	-	-							
	Trait class	<2.0	2.0-2.5	2.6-3.0	3.1-3.5	3.6-4.0	-	-	-	-	-	-	-	-	-	-	-
Panicle diameter (cm)	No. of lines	21	63	27	4	1	-	-	-	-							
	Trait class	<6	6-7	7.1-8	8.1-9	9.1-10	10.1-11	11.1-12	12.1-13	>13							
1000-grain weight (g)	No. of lines	6	12	23	24	18	11	11	8	3							
	Trait class	6	12	23	24	18	11	11	8	3							



Qualitative and quasi- qualitative traits

Frequency distribution of the 114 restorer lines for 16 qualitative and quasi-qualitative characters revealed considerable variation for traits like anthocyanin pigmentation of first leaf, panicle exertion, panicle density, plant node pigmentation, panicle shape, seed shape and seed color (Annexure III). Majority of the lines (78%) were intermediate in their growth habit. Most of the restorer lines were non-bristled except for IPC 107, IPC 408, IPC 804, IPC 1043 and IPC 1617. Only 15 lines had pubescent node and 8 had pubescent leaf sheath. Green was most dominant color for node (56%) and internode (98%), brown being the next major trait in node color and red for the internode. A majority of the lines had grey colored seeds (76%), followed by cream (17%) and deep grey colored (6%) seeds. In seed shape, obovate (56%) was the most dominant, followed by globular (40.5%) and only 1.7% lines were both elliptical and hexagonal in seed shape. About 75% of the lines had complete panicle exertion and 25% of the lines had variable exertion. Semi-compact panicles were most common (43%), followed by compact (21.5%) and loose panicles (15.5%), 1 line had very loose panicle and 16.3% lines showed variable expression within a line for very loose to very compact panicles. Only 6 lines had very compact panicles.

Within-line variability was observed in few restorer lines across two replications for some traits like anthocyanin pigmentation of seedlings, anther color, panicle exertion, panicle density, plant growth habit and plant node pigmentation. Eighteen R-lines had alternate phenotypes other than the predominant class for panicle density across both the seasons or in a single season. For instance, IPC 687 had compact panicles in the rainy season but had loose panicles in the dry season, whereas IPC 390 had loose to semi-compact panicles in the dry season. Following the same trend, alternate phenotypes were present in 14 restorer lines for anthocyanin pigmentation of seedlings, either across both the seasons or in a single season. For instance, alternate phenotype for seedling pigmentation color was present in IPC 408 in both the seasons while IPC 976 had such alternate phenotypes in rainy season only. Similarly, for panicle exertion, alternate phenotypes were present in IPC 1000 in both the seasons. This within-line variability seems to be due to the method followed for their maintenance where panicles from 10-15 plants are bulked for these restorer lines. There is a possibility that the other restorer lines which have not shown such within- line variability in



this study, might show it if tested with larger sample size, and perhaps in different environments. Therefore, there is every possibility that with larger number of plants tested for each of these restorer parents, one can come across a few plants that express the alternate phenotype of these qualitative (or quasi-qualitative) traits, which otherwise should not be construed as a new phenotype or plant type at any given time. Existence of such variability within the line has a significant bearing on the protection of intellectual property.

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Annexure I. Description of DUS¹ characters and their classification.

S. No.	Characters	States	Node ²	Stage of observation ³	Type of assessment ⁴
1.	Seedling: anthocyanin coloration of first leaf sheath	Absent Present	1 9	Seedling emergence (3)	VS
2.	Plant: growth habit	Erect Intermediate Spreading	1 5 7	Panicle emergence (45)	VG
3.	Plant: number of productive tillers	Monoculm Low (2-3 tillers) Medium (4-6 tillers) High (>6 tillers)	1 3 5 7	Dough (65)	MS
4.	Plant: height (excluding panicle)	Very short (<101 cm) Short (101-150 cm) Medium (151-200 cm) Tall (201-250 cm) Very tall (>250 cm)	1 3 5 7 9	Dough (65)	MS
5.	Plant: number of nodes	Low (<11) Medium (11-15) High (>15)	3 5 7	Dough (65)	MS
6.	Plant: node pubescence	Absent Present	1 9	Dough (65)	VS
7.	Plant: node pigmentation	Whitish Green Brown Red Purple	1 2 3 4 5	Dough (65)	VS
8.	Plant: internode pigmentation (between 3 rd and 4 th node from top)	Whitish Green Brown Red Purple	1 2 3 4 5	Dough (65)	VS
9.	Leaf: sheath length	Short (<11 cm) Medium (11-15 cm) Long (>15 cm)	3 5 7	Panicle emergence (45)	MS



S. No.	Characters	States	Node²	Stage of observation³	Type of assessment⁴
10.	Leaf: sheath pubescence	Absent Present	1 9	Panicle emergence (45)	VS
11.	Leaf: blade length	Very short (<41 cm) Short (41-50 cm) Medium (51-60 cm) Long (61-70 cm) Very long (>70 cm)	1 3 5 7 9	Panicle emergence (45)	MS
12.	Leaf: blade width (at widest point)	Narrow (<3 cm) Medium (3-4 cm) Broad (>4 cm)	3 5 7	Panicle emergence (45)	MS
13.	Panicle: time of panicle emergence (50% plants with at least one panicle emerged fully)	Very early (<43 days) Early (43-46 days) Medium (47-50 days) Late (51-54 days) Very late (>54 days)	1 3 5 7 9	Panicle emergence (45)	VG
14.	Panicle: length	Very small (<11 cm) Small (11-20 cm) Medium (21-30 cm) Long (31-40 cm) Very long (>40 cm)	1 3 5 7 9	Dough (65)	MS
15.	Panicle: girth at maximum point (excluding bristles)	Thin (<1.6 cm) Medium (1.6-3.0 cm) Thick (>3.0 cm)	3 5 7	Dough (65)	MS
16.	Panicle: exertion	Partial Complete	1 2	Dough (65)	VS
17.	Panicle: density	Very loose Loose Semi-compact Compact Very compact	1 3 5 7 9	Harvest maturity (75)	VG
18.	Panicle: tip sterility	Absent Present	1 9	Harvest maturity (75)	VS

S. No.	Characters	States	Node ²	Stage of observation ³	Type of assessment ⁴
19.	Panicle: shape	Cylindrical Conical Spindle Candle Lanceolate Dumb-bell Club Oblanceolate Globose	1 2 3 4 5 6 7 8 9	Dough (65)	VG
20.	Panicle: anther color	Yellow Brown Purple	1 2 3	Anthesis (50)	VS
21.	Panicle: anthocyanin pigmentation of glume	Absent Present	1 9	Dough (65)	VS
22.	Panicle: bristle	Absent Present	1 9	Dough (65)	VS
23.	Panicle: bristle color	Green Brown Red Purple	1 2 3 4	Dough (65)	VS
24.	Seed: color	Whitish Cream Yellow Grey Deep grey Grey brown Yellow brown	1 2 3 4 5 6 7	Harvest maturity (75)	VG
25.	Seed: shape	Obovate Elliptical Hexagonal Globular	1 2 3 4	Harvest maturity (75)	VG



S. No.	Characters	States	Node ²	Stage of observation ³	Type of assessment ⁴
26.	Seed: weight of 1000 grains	Very small (<5.0 gm) Small (5.0-7.5 gm) Medium (7.6-10.0 gm) Bold (10.1-12.5 gm) Very bold (>12.5 gm)	1 3 5 7 9	Harvest maturity (75)	MS

¹Source: Distinctness, Uniformity, Stability test guidelines and morphological descriptors for pearl millet. Published by AICPMIP (ICAR), ARS, Mandor, Jodhpur – 342304, 2006.

²Nodes (1-9) are for the purpose of electronic data processing.

³Figures in parenthesis indicate the code for growth stages:

3: Emergence stage

45: Half bloom stage

50: Anthesis stage

65: Dough stage

75: Harvest maturity

⁴Type of assessment of characteristics:

MS: Measurement of a number of individual plants or parts of plants.

VG: Visual assessment by single observation of a group of plants or parts of plants.

VS: Visual assessment by observation of individual plants or parts of plants.

Annexure II IPC lines for DUS characterization

S. No	IPC no.	Pedigree	Genetic Base (Code ¹)
1	21	WC 2-8-1	2
2	74	S38-142-1	1
3	94	EC-S3-211-1-2	2
4	98	NW 15-18-44	2
5	100	(T 166-2 x 700594-2-6)-90-1	5
6	107	LCSN 72-1-2-1-1	2
7	186	(J 260-1 x 700557-1-4-10-5-1-1)-2-2-1	5
8	244	(R 234 x R 238)-1	5
9	329	(S10LB-30 x LCSN 1225-6-3-1)-5-1-2-2	3
10	337	(5054B x F4FC 1498-1-1-2)-7-1-1-1	5
11	338	(LCSN 439-5-3-2 x Gulisitha)-6-1-1-1	4
12	367	(E 298 x F4FC 1498-1-1-2)-6-3	5
13	388	Togo 17-4-1-5	1
14	390	(F4FC 1498-1-1-3 x J 104)-11-2-1-1	5
15	404	Togo 17-4-1-18	1
16	406	(S10LB-30 X LCSN 1225-6-3-1)-5-1-2	4
17	408	(S10LB-30 x LCSN 1225-6-3-1)-3-1-1-2	4
18	417	{G73-FS-41 x (J 1188 x Cassady))-5-6-1-2	5
19	419	(S10LB-30 x LCSN 1255-6-3-1)-3-1-1-4	4
20	422	LCSN 72-1-2-1-1 (non-bristled)	2
21	458	(J 260-1 x 700557-1-4-10-5-1)-1-2-2-1	5
22	487	8082-2-5-2	1
23	492	(B 282 x J 804-1-3-9)-7-2-2	5
24	511	{(J 934-7 x 700544-7-2-1) x EC 298-2-1}-1-5	4
25	536	(J 260-1 x 700557-1-4-10-5-1)-1-2-2-2	5
26	569	{J 2002-1 x (J 934-7 x 700544-7-2-1))-1-5-5	5
27	577	{IP 2788 x (J 9347 x 700544-7-2-1))-1-4-1	3
28	616	(J 260-1 x 700557-1-4-10-5-1)-1-2-1-3	5
29	632	{(P 24 x IP 230)-1 x (A 836 x Serere 2A-3)-2}-1	3



S. No	IPC no.	Pedigree	Genetic Base (Code ¹)
30	645	{{(B 282 x J 104-1-3-11) x (SD2 x EB 2-5) (D 914-2-1)}}-3-3	5
31	655	(B Senegal-2-5 X 700651)-2-1-4	5
32	687	SC14(M)	2
33	689	R-294-1-2-8-2	2
34	701	{{(SD2 x EB 1) x (700797-2-3-1)}}-5-3-5-1	5
35	715	J 104 (DM res. version)	1
36	716	(LCSN 282-4-1-1 x S10B-38)-15-2-1	4
37	735	(J 1399-1 x B 282)-6-1-2-1-2	5
38	736	{{(SC14(M) x (SD2 x EB 2) (D 1088-1)}}-64	4
39	774	[{(J934x700544+)x(J1644x700490+)}x{G75-FS+x(J1623x700544+)}]-4+	5
40	795	(LCSN 72-1-2-2 x S10B-106)-2-2-1	4
41	802	(E 298 x LCSN 282-4-1-2)-12-2-1	5
42	804	(S10LB-30 x LCSN 1225-6-3-1)-1-2-1-1	5
43	809	(E 298 x LCSN 1173-1-9-3)-3-1-1	5
44	811	(B 282 x S10B-38)-6-1-1-1	5
45	821	ICRC-F4-139	2
46	827	(5054B x F4FC 1498-1-1-1)-3-1-1	5
47	828	(B 282 x S10B-38)-2-1-5-1-1	5
48	835	(F4FC 1436-4-3-2 x J 104 ST)-22-1-1	5
49	843	(J 834 x 700516)-1-4-4-2-4	5
50	873	(B Senegal-2-5 x EC 298-2)-2-3-1-1-3	5
51	882	(J 25-1 x J 1798)-1-1-16-4-2-2	5
52	896	8082-1-3-6-1	1
53	909	(S10LB-30 x IP 944)-6-4-5	3
54	931	(F4FC 1498-1-1-1 x J 104)-6-1-2-1-1	5
55	954	(E 298 x F4FC 1498-1-1-2)-5-3-3-1	5
56	957	[{(700626-21) x (B 282-2-1 x 700651-1)}]-4-7-1	5
57	962	(A 836 x J 1798-32-2-2)-42-1-1-3	5
58	974	[{(J 25-1 x J 1798)-1-1}]-85-1-1-3	5

S. No	IPC no.	Pedigree	Genetic Base (Code ¹)
59	976	[(J 25-1 x J 1798)-1-1]-85-1-3-4	5
60	989	[(J 934-7 x 700544-7-2-1) x P 23]-10-4-4	5
61	990	J 834 x 700516-1-4-4-3-1	5
62	991	8040-1-1-1-5	1
63	992	8040-1-2-1-6	1
64	997	8082-1-3-5-5	1
65	999	8082-1-3-6-3 (Duplicate 000897)	1
66	1000	[J 1798 x (J 934-7 x 700544-7-2-1)]-30-1-1-1	5
67	1002	[J 1472 x (J 934-7 x 700544-7-2-1)]-3-3-2-4	5
68	1018	[700651 x (J 25-1 x 700797-4-1-4-1)]-3-3	5
69	1025	[(J 1248 x 700112)-1 P-2]-31-1-1-2	5
70	1027	[(J 25-1 x J 1798)-1-1]-24-2-1-3	5
71	1040	(700619 x 700599)-3-1-3-6-1-5	5
72	1043	[(J 934-7 x 700544-7-2-1) x (P 23)]-5-2-4	5
73	1046	[J 1623 x 700544-13-4-3-3-3]-2-1-6	5
74	1047	[(J 1623 x 700490-2-6) x (EC 298-2-5-23)]-2-4	5
75	1062	[700651 x (J 25-1 x 700797-4-1-4-1)]-4-4	5
76	1078	HMP 559-6	2
77	1097	(S10LB-30 x IP 944)-6-3-1-*	3
78	1104	{700626-21 x (B 282-2-1 x 700651-1)}-4-5-3	5
79	1108	[700651 x (J 25-1 x 700797-4-1-4-1)]-5-4	5
80	1114	(B 282 x J 804-1-3-4)-59-2-1-1 (Duplicate 001065)	5
81	1178	(A 836 x J 1798-32-2-2)-5-1-1	5
82	1189	[(L 108-1) x (J 937 x 700797-16-2-2)]-5-1-1 (Duplicate 001099)	5
83	1254	(700619 x 700599)-3-2-13-7-3-4	5
84	1268	8082-1-3-4-1	1
85	1306	(Tulaja-3 x LCSN 1173-1-9-3)-15-1-1-2	4
86	1307	(LCSN 72-1-2-2 x S10B-106)-2-2-4	4
87	1309	(F4FC 1498-1-1-3 X J 104 ST)-19-2	5



S. No	IPC no.	Pedigree	Genetic Base (Code ¹)
88	1318	(J 1248 x 700112-1-2)-18-1-5	5
89	1329	(NEP 7-5603 x SS 48-40)-4-6	3
90	1351	(J 1623 x WC 6-1)-1-2-15-1	5
91	1354	EICP 8103-5	5
92	1356	(J 1248 x 700112-1-2)-18-1-2-4	5
93	1360	(B 282 x S10B-38)-1-1-3-1	5
94	1443	(B 282 x S10B-38)-3-1-3-2	5
95	1444	(B Senegal-2-5 x 700651)-2-1-1	5
96	1445	K 560-230-33	1
97	1446	Souna B	1
98	1447	B 282	1
99	1466	H 77/833-2	1
100	1470	(B 282 x J 104)-12-B-B-B-B	4
101	1471	NELC 2074	2
102	1485	(842B x 3/4EB-100)-11-9-2-50-B-B-1	3
103	1486	(842B x 3/4EB-100)-11-9-2-50-B-B-2	3
104	1501	{[(J1623x700544+)x700651+]x{G73-FS-171x(J1623x700544+)}}-10+	5
105	1503	{K 560-2 x (J 934-7 x 700544-7-2-1)}-4-1-3-3-2-2	5
106	1518	ICRC-F4-146-3	2
107	1536	{(B 282 x S10B-38)-30-2-2-2 x Togo-29-2-2}-32-2	3
108	1538	IP 9402-2-1-1-3	1
109	1551	{843B x (B 282 x S10LB-38)-30-2-1-1}-13-B-2	5
110	1583	JRWS1P1	1
111	1590	{(B 282x3/4EB-100-6-8)-2-5x(B 282x3/4EB-100-6-8)-2-1}-4-2-1-4	5
112	1617	PPMWGI 1299	1
113	1642	(23DBE-19-2 x S10B-106)-2-1-2-4	5
114	1650	{[(J1623x700544+)x700651+]x{G75-FS-171 x (J1623x700544+)}}+	5

¹Refer to Table 1

Annexure III. Morphological characteristics of pearl millet IPC lines during 2007 rainy (E1) and 2008 post-rainy season (E2) at ICRIAT, Patancheru, India.

S.No	IPC No	Leaf Sheath Length (cm)			Leaf Blade Length (cm)			Leaf Blade Width (cm)			Panicle Length (cm)			Panicle Diameter (cm)							
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	Node*				
1	21	9.7	10.6	10.1	3	55.0	53.0	54.0	5	4.06	3.6	3.8	5	14.8	15.7	15.2	3	2.7	2.7	2.7	5
2	74	9.8	10.2	10.0	3	45.2	47.4	46.3	3	2.14	2.0	2.1	3	18.0	18.1	18.0	3	1.8	1.8	1.8	5
3	94	11.0	11.3	11.2	5	60.7	56.0	58.3	5	2.88	2.8	2.9	3	12.4	12.7	12.5	3	2.2	2.2	2.2	5
4	98	12.2	12.8	12.5	5	49.8	58.1	53.9	5	2.34	2.3	2.3	3	15.1	17.2	16.1	3	1.9	2.0	2.0	5
5	100	14.6	15.0	14.8	5	61.1	62.9	62.0	7	3.52	3.5	3.5	5	20.2	22.4	21.3	5	2.7	2.4	2.6	5
6	107	12.5	12.5	12.5	5	63.2	64.7	64.0	7	3.2	3.5	3.4	5	22.0	23.7	22.9	5	2.8	2.7	2.8	5
7	186	11.8	12.0	11.9	5	52.2	51.5	51.9	5	2.81	3.1	3.0	3	18.1	17.9	18.0	3	1.9	1.9	1.9	5
8	244	12.5	12.2	12.3	5	65.3	64.2	64.7	7	3.49	3.4	3.5	5	21.6	22.0	21.8	5	2.3	2.2	2.3	5
9	329	11.9	11.1	11.5	5	54.7	49.0	51.8	5	3.67	2.9	3.3	5	15.8	16.7	16.3	3	2.7	2.3	2.5	5
10	337	12.3	12.3	12.3	5	54.2	48.4	51.3	5	3.19	2.6	2.9	3	16.0	17.6	16.8	3	2.2	1.8	2.0	5
11	338	14.8	15.1	15.0	5	60.5	65.4	62.9	7	5.00	4.1	4.5	7	16.0	18.6	17.3	3	2.9	3.0	2.9	5
12	367	10.6	10.5	10.5	3	49.5	48.2	48.9	3	3.37	2.8	3.1	5	19.1	17.8	18.5	3	2.8	1.9	2.3	5
13	388	10.9	11.8	11.3	5	52.3	53.8	53.1	5	3.61	3.5	3.6	5	15.1	15.2	15.1	3	2.4	2.3	2.3	5
14	390	8.9	9.1	9.0	3	47.8	44.9	46.3	3	2.64	2.5	2.6	3	15.7	16.7	16.2	3	2.2	1.9	2.0	5
15	404	9.6	9.1	9.4	3	41.7	42.5	42.1	3	3.79	3.0	3.4	5	13.9	13.6	13.7	3	2.4	2.2	2.3	5
16	406	13.9	12.6	13.2	5	58.6	49.7	54.2	5	2.70	2.3	2.5	3	23.3	23.7	23.5	5	2.6	2.4	2.5	5
17	408	16.7	17.4	17.1	7	71.2	68.8	70.0	7	3.67	3.5	3.6	5	25.4	26.0	25.7	5	3.2	2.9	3.1	7

Annexure III.																					
S.No	IPC No.	Number of Nodes Per Plant			Number of Productive Tillers			Plant Height (Excl.spike) (cm)			Time to 50% flowering			1000-Grain Weight (g)							
		E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*				
1	21	9.9	9.2	9.5	3	1.90	1.9	1.9	1	173.2	151.6	162.4	5	49.0	51.0	50	5	10.2	9.8	10.0	5
2	74	7.3	7.1	7.2	3	2.65	3.4	3.0	3	122.0	118.1	120.1	3	45.5	49.0	47	5	5.7	5.9	5.8	3
3	94	9.7	8.0	8.8	3	1.75	2.5	2.1	3	166.6	130.3	148.5	3	54.5	49.0	52	7	6.6	8.9	7.7	5
4	98	7.5	8.8	8.1	3	2.10	3.4	2.7	3	122.9	142.1	132.5	3	42.0	51.5	47	3	6.4	7.2	6.8	3
5	100	9.5	8.9	9.2	3	1.50	1.2	1.4	1	171.3	150.1	160.7	5	49.0	51.5	50	5	8.9	8.2	8.5	5
6	107	9.0	9.0	9.0	3	1.3	2.2	1.8	1	148.3	151.3	149.8	3	46.2	47.3	47	5.0	11.4	10.7	11.1	7
7	186	8.5	7.8	8.1	3	2.30	2.8	2.5	3	121.4	113.1	117.2	3	42.0	48.0	45	3	5.9	5.8	5.8	3
8	244	9.1	8.8	8.9	3	1.15	1.2	1.2	1	158.4	149.0	153.7	5	47.5	49.0	48	5	13.1	11.7	12.4	7
9	329	9.3	7.6	8.4	3	2.50	2.6	2.6	3	155.2	129.3	142.2	3	45.0	42.0	44	3	8.4	8.1	8.2	5
10	337	8.5	6.5	7.5	3	2.10	2.8	2.5	3	136.2	112.9	124.6	3	45.5	43.5	45	3	8.1	8.2	8.1	5
11	338	8.9	8.5	8.7	3	1.45	2.2	1.8	1	176.5	161.7	169.1	5	48.0	52.0	50	5	11.1	11.8	11.4	7
12	367	9.7	8.3	9.0	3	2.55	2.5	2.5	3	168.2	146.9	157.5	5	47.0	43.5	45	3	9.1	8.8	9.0	5
13	388	8.7	7.8	8.3	3	2.75	2.7	2.7	3	146.9	131.8	139.4	3	46.0	48.0	47	5	9.4	8.8	9.1	5
14	390	8.9	7.1	8.0	3	3.20	5.6	4.4	5	144.0	114.0	129.0	3	46.0	45.0	46	3	7.6	8.3	8.0	5
15	404	8.5	7.2	7.8	3	2.55	2.2	2.4	3	113.4	100.6	107.0	3	45.0	47.0	46	3	9.5	9.4	9.4	5
16	406	8.4	7.0	7.7	3	1.75	3.3	2.5	3	152.2	122.8	137.5	3	48.0	45.5	47	3	10.1	10.2	10.1	7
17	408	9.9	9.3	9.6	3	2.00	1.8	1.9	1	155.6	147.5	151.5	5	52.5	47.5	50	5	12.5	9.7	11.1	7



Annexure III.

S.No	IPC No	Leaf Sheath Length (cm)			Leaf Blade Length (cm)			Leaf Blade Width (cm)			Panicle Length (cm)			Panicle Diameter (cm)							
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	Node*				
18	417	13.4	12.6	13.0	5	57.0	60.0	58.5	5	3.43	3.0	3.2	5	17.7	17.6	17.7	3	2.4	2.3	2.3	5
19	419	13.1	14.7	13.9	5	58.6	59.1	58.9	5	2.37	2.6	2.5	3	22.4	21.9	22.1	5	2.6	2.7	2.7	5
20	422	10.9	10.3	10.6	3	50.1	55.3	52.7	5	3.25	3.1	3.2	5	15.0	15.5	15.3	3	2.3	2.3	2.3	5
21	458	12.3	12.1	12.2	5	53.9	55.5	54.7	5	2.75	2.9	2.8	3	22.3	20.9	21.6	5	2.0	1.9	1.9	5
22	487	13.2	13.5	13.3	5	65.6	62.7	64.1	7	2.86	2.6	2.7	3	21.7	20.4	21.0	5	2.4	2.2	2.3	5
23	492	12.1	12.8	12.4	5	58.0	57.5	57.8	5	3.07	3.1	3.1	5	18.8	19.7	19.2	3	2.3	2.3	2.3	5
24	511	15.4	16.3	15.8	7	71.5	69.2	70.4	9	3.58	4.0	3.8	5	22.5	23.9	23.2	5	2.4	2.4	2.4	5
25	536	12.4	11.6	12.0	5	54.0	56.7	55.4	5	3.85	3.7	3.8	5	20.1	19.2	19.7	3	1.9	1.9	1.9	5
26	569	12.2	12.8	12.5	5	49.7	59.9	54.8	5	3.03	3.4	3.2	5	16.1	15.7	15.9	3	1.8	1.8	1.8	5
27	577	9.7	9.9	9.8	3	48.7	52.1	50.4	3	2.48	2.6	2.5	3	15.9	15.7	15.8	3	2.0	2.0	2.0	5
28	616	11.6	11.3	11.5	5	58.3	57.5	57.9	5	4.15	4.2	4.1	7	18.7	19.8	19.3	3	2.1	2.1	2.1	5
29	632	11.1	10.9	11.0	5	46.6	45.7	46.2	3	2.57	2.7	2.7	3	17.8	17.1	17.5	3	1.8	1.9	1.9	5
30	645	13.1	12.2	12.6	5	52.5	54.7	53.6	5	3.13	2.7	2.9	3	18.7	17.1	17.9	3	2.1	1.9	2.0	5
31	655	13.6	14.1	13.8	5	68.3	60.0	64.2	7	3.04	2.8	2.9	3	26.3	26.7	26.5	5	2.0	1.8	1.9	5
32	687	15.4	16.7	16.0	7	69.4	66.3	67.9	7	4.06	3.9	4.0	5	25.6	25.5	25.6	5	2.9	2.7	2.8	5
33	689	10.8	11.1	11.0	3	57.7	54.2	56.0	5	3.31	3.2	3.2	5	19.9	21.3	20.6	5	2.5	2.4	2.5	5
34	701	12.9	13.5	13.2	5	62.4	60.9	61.6	7	2.52	2.6	2.6	3	17.2	16.9	17.0	3	2.3	2.3	2.3	5
35	715	10.2	10.0	10.1	3	48.7	47.5	48.1	3	2.19	2.2	2.2	3	10.7	9.9	10.3	1	1.9	1.9	1.9	5
36	716	11.6	12.2	11.9	5	72.8	72.3	72.5	9	3.25	2.9	3.1	5	16.1	15.7	15.9	3	2.8	3.0	2.9	5

Annexure III.

S.No	IPC No.	Number of Nodes Per Plant				Number of Productive Tillers				Plant Height (Excl.spike) (cm)				Time to 50% flowering				1000-Grain Weight (g)			
		E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*
		18	417	8.2	7.7	8.0	3	2.40	2.2	2.3	3	154.8	144.6	149.7	3	44.5	45.5	45	3	9.7	9.9
19	419	9.1	10.4	9.7	3	1.20	1.4	1.3	1	157.4	170.1	163.8	5	47.0	53.0	50	5	9.2	9.3	9.2	5
20	422	8.8	8.0	8.4	3	2.40	2.6	2.5	3	134.0	128.5	131.2	3	43.5	48.0	46	3	7.9	7.7	7.8	5
21	458	8.4	7.6	8.0	3	2.30	2.7	2.5	3	122.0	127.6	124.8	3	41.0	45.0	43	3	6.4	7.7	7.0	3
22	487	9.5	9.0	9.2	3	2.85	2.0	2.4	3	167.1	147.1	157.1	5	50.5	55.0	53	7	8.2	8.5	8.4	5
23	492	10.0	8.9	9.4	3	2.05	2.3	2.2	3	187.2	161.8	174.5	5	51.0	52.0	52	7	9.0	8.2	8.6	5
24	511	8.7	8.6	8.7	3	2.10	1.3	1.7	1	172.3	177.1	174.7	5	50.0	53.0	52	7	8.7	8.1	8.4	5
25	536	9.4	8.2	8.8	3	2.05	1.9	2.0	1	136.9	134.0	135.5	3	43.5	49.0	46	3	7.8	7.1	7.4	3
26	569	6.7	7.5	7.1	3	2.70	3.3	3.0	3	110.9	119.3	115.1	3	46.0	53.0	50	5	8.2	10.2	9.2	5
27	577	8.4	7.4	7.9	3	2.45	2.7	2.6	3	143.4	150.8	147.1	3	43.0	48.5	46	3	11.1	10.5	10.8	7
28	616	10.1	9.7	9.9	3	2.20	1.4	1.8	1	162.5	146.4	154.5	5	47.5	54.5	51	7	7.2	7.8	7.5	3
29	632	9.2	9.3	9.2	3	1.50	2.2	1.8	1	130.2	121.1	125.7	3	46.0	50.0	48	5	7.1	7.5	7.3	3
30	645	9.0	8.4	8.7	3	2.10	1.8	2.0	1	145.3	119.4	132.4	3	51.5	51.5	52	7	7.3	7.4	7.3	3
31	655	9.6	8.1	8.9	3	1.80	2.3	2.1	3	161.5	131.0	146.2	3	51.5	49.0	50	5	9.7	8.6	9.2	5
32	687	10.3	8.9	9.6	3	1.40	1.6	1.5	1	222.4	166.7	194.6	5	56.5	52.5	55	9	10.8	9.0	9.9	5
33	689	8.8	8.4	8.6	3	2.35	2.8	2.6	3	138.1	128.9	133.5	3	48.5	50.0	49	5	9.1	9.3	9.2	5
34	701	8.8	8.2	8.5	3	2.50	2.5	2.5	3	137.3	129.9	133.6	3	45.5	50.5	48	5	7.7	7.6	7.7	5
35	715	6.7	7.1	6.9	3	2.70	2.3	2.5	3	117.8	126.4	122.1	3	41.0	46.5	44	3	6.4	7.0	6.7	3
36	716	7.7	7.4	7.5	3	2.00	1.6	1.8	1	156.4	147.3	151.8	5	47.0	51.5	49	5	6.5	7.8	7.1	3



Annexure III.

S.No	IPC No	Leaf Sheath Length (cm)			Leaf Blade Length (cm)			Leaf Blade Width (cm)			Panicle Length (cm)			Panicle Diameter (cm)						
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	Node*			
37	735	11.4	12.2	11.8	62.3	60.2	61.2	7	3.56	3.9	3.7	5	16.3	15.8	16.1	3	2.5	2.3	2.4	5
38	736	13.2	13.0	13.1	59.9	59.5	59.7	5	3.97	3.8	3.9	5	24.6	24.0	24.3	5	2.6	2.2	2.4	5
39	774	10.0	9.7	9.8	54.6	56.1	55.3	5	3.06	2.9	3.0	3	14.8	15.3	15.1	3	2.7	2.3	2.5	5
40	795	16.2	16.3	16.2	76.2	70.8	73.5	9	3.21	2.9	3.1	5	23.6	23.1	23.4	5	2.8	2.5	2.6	5
41	802	10.6	10.2	10.4	58.6	52.0	55.3	5	3.29	2.8	3.1	5	15.2	15.0	15.1	3	1.8	1.6	1.7	5
42	804	16.7	14.8	15.8	67.9	56.1	62.0	7	3.38	2.7	3.1	5	29.8	29.5	29.7	5	2.5	2.2	2.3	5
43	809	13.6	13.8	13.7	58.8	58.1	58.4	5	3.44	3.2	3.3	5	16.5	17.4	16.9	3	2.2	2.1	2.2	5
44	811	12.1	12.6	12.3	59.0	50.9	55.0	5	4.02	5.5	4.8	7	18.1	20.0	19.1	3	3.0	2.6	2.8	5
45	821	11.6	12.2	11.9	53.9	59.3	56.6	5	3.90	4.1	4.0	5	19.8	21.2	20.5	5	2.4	2.6	2.5	5
46	827	10.4	10.5	10.4	52.2	58.0	55.1	5	2.85	2.7	2.8	3	19.7	21.9	20.8	5	3.2	3.3	3.3	7
47	828	13.1	13.1	13.1	59.6	53.8	56.7	5	3.54	3.0	3.3	5	12.1	12.2	12.2	3	3.1	2.9	3.0	5
48	835	11.5	11.3	11.4	56.2	55.8	56.0	5	2.77	2.6	2.7	3	18.3	18.8	18.6	3	2.3	2.2	2.3	5
49	843	13.7	13.4	13.5	58.1	56.1	57.1	5	3.13	2.8	3.0	3	18.3	18.3	18.3	3	2.3	2.1	2.2	5
50	873	10.9	11.7	11.3	53.9	53.3	53.6	5	3.25	3.2	3.2	5	15.3	16.2	15.7	3	2.2	2.1	2.2	5
51	882	13.3	13.7	13.5	55.2	58.9	57.1	5	3.58	3.5	3.5	5	16.9	18.0	17.5	3	2.1	2.2	2.1	5
52	896	10.1	9.9	10.0	59.3	53.9	56.6	5	2.38	2.0	2.2	3	16.5	17.8	17.2	3	1.8	1.5	1.6	5

Annexure III.																					
S.No	IPC No.	Number of Nodes Per Plant				Number of Productive Tillers				Plant Height (Excl.spike) (cm)				Time to 50% flowering				1000-Grain Weight (g)			
		E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*
37	735	7.7	8.2	8.0	3	1.80	2.1	1.9	1	100.4	83.4	91.9	1	50.5	54.5	53	7	8.4	8.4	8.4	5
38	736	8.4	7.0	7.7	3	2.10	1.5	1.8	1	59.1	53.5	56.3	1	49.5	53.0	51	7	9.6	9.1	9.3	5
39	774	9.2	8.0	8.6	3	2.60	1.9	2.2	3	163.7	162.4	163.1	5	45.0	47.0	46	3	9.9	8.5	9.2	5
40	795	7.6	7.4	7.5	3	1.75	1.6	1.7	1	148.1	130.9	139.5	3	50.0	53.5	52	7	11.0	10.3	10.6	7
41	802	9.2	8.0	8.6	3	2.95	2.8	2.9	3	147.3	121.5	134.4	3	51.5	51.5	52	7	6.5	6.6	6.5	3
42	804	8.5	7.0	7.7	3	2.70	2.0	2.3	3	139.7	117.8	128.7	3	45.5	45.5	46	3	11.7	9.4	10.5	7
43	809	8.7	7.4	8.0	3	1.85	2.6	2.2	3	143.5	135.9	139.7	3	44.5	47.5	46	3	8.7	8.7	8.7	5
44	811	8.7	7.3	8.0	3	2.00	2.0	2.0	3	144.6	123.0	133.8	3	49.0	48.0	49	5	12.5	11.0	11.7	7
45	821	9.4	9.7	9.5	3	2.55	2.0	2.3	3	134.0	124.3	129.1	3	45.5	49.5	48	5	10.6	10.0	10.3	7
46	827	8.1	8.6	8.3	3	2.10	1.6	1.9	1	116.3	130.6	123.5	3	43.5	49.0	46	3	12.5	13.0	12.7	7
47	828	8.5	6.8	7.6	3	2.55	2.3	2.4	3	136.9	130.8	133.8	3	45.5	44.0	45	3	14.1	13.9	14.0	7
48	835	9.1	9.1	9.1	3	1.30	1.9	1.6	1	152.5	136.9	144.7	3	48.5	48.0	48	5	8.1	8.8	8.4	5
49	843	7.7	7.8	7.8	3	2.40	2.2	2.3	3	148.9	137.5	143.2	3	49.5	50.5	50	5	9.1	8.3	8.7	5
50	873	9.1	8.1	8.6	3	2.00	2.0	2.0	1	146.5	138.6	142.5	3	52.0	53.0	53	7	6.7	6.5	6.6	3
51	882	9.4	8.8	9.1	3	1.95	2.1	2.0	3	142.4	130.2	136.3	3	47.0	50.5	49	5	7.0	7.7	7.4	3
52	896	9.2	8.4	8.8	3	3.10	3.7	3.4	3	164.0	139.7	151.9	5	52.0	51.0	52	7	5.9	6.0	5.9	3



Annexure III.

S.No	IPC No.	Leaf Sheath Length (cm)			Leaf Blade Length (cm)			Leaf Blade Width (cm)			Panicle Length (cm)			Panicle Diameter (cm)							
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean					
53	909	11.0	11.1	11.0	5	51.7	53.5	52.6	5	2.95	2.9	2.9	3	16.4	16.3	16.3	3	2.0	1.9	2.0	5
54	931	10.0	9.8	9.9	3	46.8	49.5	48.1	3	2.85	2.7	2.8	3	14.5	14.3	14.4	3	2.1	2.2	2.1	5
55	954	14.1	13.6	13.9	5	66.6	63.6	65.1	7	3.63	3.2	3.4	5	19.8	18.7	19.3	3	1.6	1.6	1.6	5
56	957	8.8	9.6	9.2	3	63.2	55.6	59.4	5	3.00	2.9	3.0	3	17.2	19.3	18.2	3	2.4	2.2	2.3	5
57	962	11.0	12.5	11.7	5	58.0	57.2	57.6	5	2.88	3.1	3.0	3	17.9	18.7	18.3	3	2.6	2.6	2.6	5
58	974	12.9	13.3	13.1	5	65.5	59.6	62.5	7	3.25	3.3	3.3	5	21.0	20.1	20.6	5	2.4	2.3	2.4	5
59	976	14.5	15.1	14.8	5	73.8	62.6	68.2	7	3.64	3.2	3.4	5	23.9	23.4	23.6	5	2.4	2.4	2.4	5
60	989	12.6	12.4	12.5	5	62.8	60.7	61.8	7	3.30	2.9	3.1	5	17.4	16.3	16.8	3	2.7	2.7	2.7	5
61	990	12.2	12.2	12.2	5	63.6	60.4	62.0	7	3.28	3.0	3.2	5	22.7	22.4	22.6	5	2.1	1.8	1.9	5
62	991	11.9	11.4	11.6	5	53.0	47.0	50.0	3	3.52	2.7	3.1	5	16.4	15.7	16.1	3	2.7	2.6	2.6	5
63	992	12.3	12.1	12.2	5	55.6	53.6	54.6	5	4.08	3.6	3.9	5	15.4	17.5	16.5	3	2.9	2.7	2.8	5
64	997	11.4	12.2	11.8	5	56.7	53.5	55.1	5	2.33	1.9	2.1	3	17.5	18.1	17.8	3	1.8	1.7	1.7	5
65	999	12.5	12.7	12.6	5	57.6	63.7	60.6	5	3.79	3.6	3.7	5	14.7	15.0	14.9	3	2.4	2.4	2.4	5
66	1000	12.2	13.0	12.6	5	60.4	64.0	62.2	7	3.60	3.8	3.7	5	15.9	16.6	16.3	3	2.3	2.4	2.4	5
67	1002	9.8	12.0	10.9	3	56.7	60.5	58.6	5	3.53	3.7	3.6	5	12.8	18.1	15.4	3	2.9	2.9	2.9	5
68	1018	16.4	15.3	15.9	7	69.3	72.6	71.0	9	3.54	3.4	3.5	5	41.2	39.0	40.1	9	2.1	1.9	2.0	5
69	1025	14.2	14.0	14.1	5	68.9	63.1	66.0	7	3.42	3.4	3.4	5	23.9	24.3	24.1	5	1.8	1.7	1.8	5
70	1027	13.3	13.2	13.2	5	64.5	54.9	59.7	5	3.22	2.8	3.0	3	20.6	18.8	19.7	3	2.2	2.3	2.3	5
71	1040	14.4	13.8	14.1	5	62.8	51.8	57.3	5	3.41	2.9	3.2	5	19.3	17.1	18.2	3	2.2	2.1	2.2	5

Annexure III.																					
S.No	IPC No.	Number of Nodes Per Plant				Number of Productive Tillers				Plant Height (Excl.spike) (cm)				Time to 50% flowering				1000-Grain Weight (g)			
		E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*
53	909	9.1	8.6	8.8	3	2.90	3.2	3.0	3	149.9	134.7	142.3	3	48.0	52.5	50	5	8.4	8.2	8.3	5
54	931	7.7	7.5	7.6	3	2.25	1.9	2.1	3	123.8	116.7	120.3	3	45.5	51.0	48	5	6.8	7.2	7.0	3
55	954	8.6	7.4	8.0	3	3.00	2.4	2.7	3	141.5	131.3	136.4	3	50.5	52.0	51	7	7.9	8.6	8.2	5
56	957	8.8	8.3	8.6	3	2.45	2.8	2.6	3	114.0	110.0	112.0	3	51.5	50.5	51	7	9.0	8.4	8.7	5
57	962	9.1	8.3	8.7	3	2.25	3.4	2.8	3	128.3	125.5	126.9	3	47.5	51.0	49	5	8.8	8.9	8.9	5
58	974	10.4	8.6	9.5	3	2.45	2.0	2.2	3	170.2	125.9	148.0	3	53.0	52.5	53	7	6.3	6.2	6.2	3
59	976	10.0	8.0	9.0	3	1.65	1.8	1.7	1	180.8	131.9	156.4	5	57.0	52.0	55	9	5.3	6.1	5.7	3
60	989	10.0	9.0	9.5	3	2.50	2.0	2.3	3	187.6	150.0	168.8	5	53.5	55.5	55	9	10.2	9.4	9.8	5
61	990	9.4	9.2	9.3	3	1.95	1.9	1.9	1	153.3	123.1	138.2	3	52.0	56.0	54	7	7.5	6.3	6.9	3
62	991	8.7	7.6	8.1	3	2.55	2.5	2.5	3	120.8	107.8	114.3	3	43.0	42.0	43	1	9.5	9.1	9.3	5
63	992	9.7	8.1	8.9	3	2.15	2.6	2.4	3	131.1	119.3	125.2	3	44.5	44.0	44	3	11.9	11.1	11.5	7
64	997	9.2	7.7	8.5	3	2.15	2.7	2.4	3	156.0	145.2	150.6	5	48.0	48.0	48	5	7.8	7.3	7.6	3
65	999	8.4	8.6	8.5	3	2.10	2.4	2.2	3	151.3	146.5	148.9	3	45.5	52.0	49	5	13.0	11.4	12.2	7
66	1000	8.3	8.3	8.3	3	2.15	2.0	2.1	3	144.1	144.2	144.1	3	47.0	50.5	49	5	10.0	11.1	10.5	7
67	1002	9.9	8.8	9.3	3	1.60	2.6	2.1	3	161.4	158.2	159.8	5	52.0	45.0	49	5	9.1	8.3	8.7	5
68	1018	9.0	7.6	8.3	3	1.90	1.4	1.7	1	127.3	113.3	120.3	3	49.0	54.5	52	7	8.7	9.2	9.0	5
69	1025	8.2	7.1	7.7	3	2.35	3.3	2.8	3	118.1	94.9	106.5	3	51.5	51.5	52	7	6.0	7.7	6.9	3
70	1027	9.8	8.8	9.3	3	1.75	2.2	2.0	1	177.0	153.4	165.2	5	44.5	43.0	44	3	7.5	7.4	7.5	3
71	1040	9.9	8.5	9.2	3	2.60	1.8	2.2	3	189.2	156.7	172.9	5	57.0	50.5	54	7	7.4	8.1	7.7	5

Annexure III.

S.No	IPC No.	Leaf Sheath Length (cm)			Leaf Blade Length (cm)			Leaf Blade Width (cm)			Panicle Length (cm)			Panicle Diameter (cm)						
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean				
72	1043	13.8	13.8	13.8	61.1	63.1	62.1	7	2.89	3.0	3.0	3	27.0	27.8	27.4	5	2.9	3.0	3.0	5
73	1046	14.6	15.3	15.0	70.7	73.7	72.2	9	3.27	3.4	3.3	5	25.5	26.6	26.0	5	2.4	2.4	2.4	5
74	1047	10.5	11.4	10.9	47.5	50.9	49.2	3	3.23	2.8	3.0	5	24.8	20.9	22.9	5	2.0	1.9	2.0	5
75	1062	14.4	13.6	14.0	63.1	57.6	60.3	5	3.70	3.2	3.5	5	30.7	29.4	30.0	5	2.9	2.8	2.8	5
76	1078	14.1	15.3	14.7	63.2	59.2	61.2	7	3.03	2.8	2.9	3	26.6	29.3	28.0	5	2.0	1.8	1.9	5
77	1097	12.0	12.3	12.1	53.0	54.8	53.9	5	2.80	2.6	2.7	3	20.0	18.8	19.4	3	2.6	2.4	2.5	5
78	1104	9.3	9.9	9.6	60.2	61.1	60.7	5	2.59	3.0	2.8	3	20.0	21.3	20.7	5	2.6	2.6	2.6	5
79	1108	14.1	14.2	14.2	62.9	57.0	60.0	5	3.78	3.2	3.5	5	28.5	31.2	29.8	5	2.7	2.5	2.6	5
80	1114	11.9	13.1	12.5	66.9	72.0	69.5	7	2.89	3.3	3.1	5	20.9	21.7	21.3	5	2.7	2.8	2.8	5
81	1178	11.9	11.9	11.9	59.6	63.0	61.3	7	2.96	3.4	3.2	5	16.2	16.7	16.4	3	2.1	2.2	2.2	5
82	1189	11.9	11.7	11.8	54.5	59.9	57.2	5	2.65	2.9	2.8	3	21.2	13.9	17.5	3	1.8	1.9	1.8	5
83	1254	12.8	12.4	12.6	58.3	50.7	54.5	5	3.47	3.2	3.3	5	29.3	26.9	28.1	5	1.9	1.8	1.9	5
84	1268	11.2	11.4	11.3	60.3	56.9	58.6	5	2.35	2.1	2.2	3	17.9	17.9	17.9	3	1.8	1.6	1.7	5
85	1306	10.1	10.4	10.3	53.5	53.7	53.6	5	2.68	2.8	2.8	3	13.4	13.4	13.4	3	1.7	1.6	1.7	5
86	1307	11.9	10.1	11.0	67.5	56.9	62.2	7	3.51	3.1	3.3	5	17.3	17.1	17.2	3	2.5	2.5	2.5	5
87	1309	8.5	8.6	8.5	51.0	54.3	52.7	5	2.67	2.9	2.8	3	15.6	15.3	15.5	3	2.1	2.1	2.1	5
88	1318	10.7	10.5	10.6	54.1	54.2	54.2	5	2.41	3.2	2.8	3	17.1	16.4	16.8	3	2.0	2.1	2.1	5
89	1329	12.9	12.5	12.7	54.1	54.2	54.1	5	2.90	2.9	2.9	3	18.2	19.0	18.6	3	2.2	2.1	2.1	5
90	1351	12.0	13.1	12.6	47.7	53.0	50.4	3	3.40	3.8	3.6	5	18.2	18.6	18.4	3	2.3	2.3	2.3	5

Annexure III.																					
S.No	IPC No.	Number of Nodes Per Plant				Number of Productive Tillers				Plant Height (Excl.spike) (cm)				Time to 50% flowering				1000-Grain Weight (g)			
		E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*
72	1043	8.9	8.6	8.7	3	2.25	2.1	2.2	3	153.8	131.2	142.5	3	46.0	52.0	49	5	10.0	10.1	10.0	5
73	1046	8.6	7.8	8.2	3	1.95	1.7	1.8	1	146.0	128.9	137.5	3	56.0	57.0	57	9	9.4	9.6	9.5	5
74	1047	10.2	10.2	10.2	3	2.05	1.5	1.8	1	156.7	147.4	152.0	5	54.0	54.0	54	7	6.2	8.7	7.4	3
75	1062	9.2	7.7	8.5	3	1.45	1.2	1.3	1	155.8	134.1	145.0	3	47.5	46.5	47	5	10.0	10.2	10.1	5
76	1078	9.0	8.1	8.5	3	2.45	1.9	2.2	3	181.4	164.4	172.9	5	46.5	48.0	47	5	9.2	8.3	8.8	5
77	1097	8.5	8.0	8.2	3	2.50	2.0	2.2	3	125.5	124.4	125.0	3	43.0	46.0	45	3	8.1	9.0	8.5	5
78	1104	8.6	8.2	8.4	3	2.00	2.9	2.4	3	119.0	127.9	123.5	3	47.0	51.0	49	5	5.8	8.4	7.1	3
79	1108	8.3	7.1	7.7	3	2.35	1.2	1.8	1	144.8	125.1	134.9	3	48.0	46.5	47	5	11.9	10.5	11.2	7
80	1114	10.4	10.0	10.2	3	1.60	1.2	1.4	1	219.4	182.8	201.1	7	56.0	58.5	57	9	10.5	9.6	10.1	5
81	1178	8.9	8.6	8.7	3	1.90	1.3	1.6	1	154.3	150.1	152.2	5	52.0	57.0	55	9	5.6	7.7	6.6	3
82	1189	8.3	8.3	8.3	3	2.80	2.1	2.5	3	121.6	125.4	123.5	3	46.0	51.5	49	5	5.8	5.9	5.8	3
83	1254	10.0	9.1	9.5	3	1.55	1.3	1.4	1	196.7	168.6	182.7	5	51.0	52.0	52	7	8.4	8.5	8.4	5
84	1268	9.0	8.8	8.9	3	2.85	3.5	3.2	3	165.1	147.6	156.4	5	49.0	50.0	50	5	7.6	6.8	7.2	3
85	1306	9.4	9.1	9.3	3	3.35	4.1	3.7	3	130.6	115.1	122.8	3	49.0	56.0	53	7	6.1	5.6	5.9	3
86	1307	9.8	10.3	10.1	3	2.10	2.3	2.2	3	174.9	149.2	162.1	5	57.0	65.0	61	9	6.2	6.7	6.4	3
87	1309	9.3	9.0	9.1	3	2.65	3.1	2.9	3	135.1	133.5	134.3	3	45.5	49.0	47	5	10.5	10.0	10.3	7
88	1318	8.9	9.5	9.2	3	2.25	1.6	1.9	1	116.9	111.4	114.1	3	47.5	55.0	51	7	7.5	7.9	7.7	5
89	1329	9.6	9.3	9.5	3	2.85	2.3	2.6	3	160.1	150.3	155.2	5	47.0	49.5	48	5	7.6	7.2	7.4	3
90	1351	8.6	8.6	8.6	3	1.50	2.1	1.8	1	103.8	92.7	98.2	1	49.0	50.0	50	5	6.4	8.0	7.2	3



Annexure III.

S.No	Leaf Sheath Length (cm)				Leaf Blade Length (cm)				Leaf Blade Width (cm)				Panicle Length (cm)				Panicle Diameter (cm)				
	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	
91	1354	14.2	14.9	14.6	5	61.3	63.4	62.4	7	3.42	3.4	3.4	5	20.2	19.9	20.0	3	2.6	2.4	2.5	5
92	1356	17.5	14.0	15.7	7	60.6	55.4	58.0	5	3.40	3.6	3.5	5	19.7	17.5	18.6	3	3.1	2.8	2.9	5
93	1360	9.5	9.8	9.6	3	53.7	54.4	54.0	5	3.79	3.9	3.8	5	13.2	13.0	13.1	3	2.6	2.5	2.5	5
94	1443	14.4	13.6	14.0	5	67.4	73.7	70.6	9	4.39	4.3	4.3	7	21.0	20.9	20.9	5	3.0	3.0	3.0	5
95	1444	12.3	13.1	12.7	5	55.7	55.9	55.8	5	3.02	2.8	2.9	3	19.6	21.9	20.7	5	2.5	2.1	2.3	5
96	1445	11.1	11.6	11.4	5	46.5	52.0	49.3	3	2.94	3.2	3.1	5	15.9	16.5	16.2	3	2.6	2.7	2.7	5
97	1446	13.7	13.8	13.8	5	55.8	59.7	57.8	5	4.07	3.9	4.0	5	25.2	23.8	24.5	5	2.5	2.2	2.4	5
98	1447	12.3	12.4	12.3	5	65.2	60.4	62.8	7	3.27	3.1	3.2	5	19.7	16.3	18.0	3	2.3	2.1	2.2	5
99	1466	9.1	9.0	9.1	3	40.5	46.3	43.4	3	1.87	2.1	2.0	3	13.4	13.2	13.3	3	1.7	1.7	1.7	5
100	1470	11.4	11.5	11.5	5	55.2	56.8	56.0	5	2.8	2.9	2.9	3	17.1	18.1	17.6	3	2.5	2.5	2.5	5
101	1471	13.7	14.0	13.8	5	66.1	64.7	65.4	7	2.52	2.4	2.5	3	24.2	22.0	23.1	5	2.0	1.7	1.8	5
102	1485	13.5	14.4	14.0	5	49.7	53.0	51.3	5	2.82	2.8	2.8	3	16.8	18.2	17.5	3	2.8	2.5	2.7	5
103	1486	14.2	15.4	14.8	5	47.1	51.1	49.1	3	2.40	2.7	2.6	3	16.7	18.3	17.5	3	2.4	2.3	2.3	5
104	1501	10.7	11.1	10.9	3	54.4	59.5	57.0	5	3.54	3.7	3.6	5	19.4	20.9	20.1	5	2.3	2.3	2.3	5
105	1503	12.0	12.8	12.4	5	49.6	50.2	49.9	3	3.03	3.2	3.1	5	17.2	16.2	16.7	3	2.4	2.4	2.4	5

Annexure III.																										
S.No	IPC No.	Number of Nodes Per Plant					Number of Productive Tillers					Plant Height (Excl.spike) (cm)					Time to 50% flowering					1000-Grain Weight (g)				
		E1	E2	Mean	Node*	Node*	E1	E2	Mean	Node*	Node*	E1	E2	Mean	Node*	Node*	E1	E2	Mean	Node*	Node*	E1	E2	Mean	Node*	Node*
91	1354	9.4	9.1	9.2	3	2.50	1.5	2.0	1	158.8	138.7	148.8	3	48.0	53.0	51	5	8.4	8.2	8.3	5	8.4	8.2	8.3	5	
92	1356	8.1	7.2	7.7	3	1.35	1.7	1.5	1	140.3	126.8	133.5	3	44.5	42.0	43	3	12.9	10.7	11.8	7	12.9	10.7	11.8	7	
93	1360	9.5	8.7	9.1	3	2.05	2.7	2.4	3	168.8	152.0	160.4	5	47.0	49.0	48	5	8.3	7.3	7.8	5	8.3	7.3	7.8	5	
94	1443	8.9	9.0	8.9	3	1.70	1.1	1.4	1	145.3	117.9	131.6	3	46.5	54.0	50	5	6.8	7.6	7.2	3	6.8	7.6	7.2	3	
95	1444	10.3	8.8	9.6	3	1.80	1.7	1.8	1	188.6	170.9	179.8	5	46.0	42.5	44	3	12.2	10.5	11.3	7	12.2	10.5	11.3	7	
96	1445	11.2	11.3	11.2	5	2.35	1.5	1.9	1	186.6	176.7	181.6	5	52.5	57.0	55	9	11.5	11.1	11.3	7	11.5	11.1	11.3	7	
97	1446	9.6	9.3	9.4	3	1.65	1.4	1.5	1	154.3	131.7	143.0	3	48.5	49.0	49	5	7.9	7.0	7.4	3	7.9	7.0	7.4	3	
98	1447	8.7	8.4	8.6	3	2.20	1.8	2.0	3	112.1	85.0	98.5	1	55.0	55.0	55	9	7.7	9.7	8.7	5	7.7	9.7	8.7	5	
99	1466	7.4	8.2	7.8	3	3.70	3.5	3.6	3	119.4	122.3	120.8	3	41.0	48.0	45	3	7.4	6.2	6.8	3	7.4	6.2	6.8	3	
100	1470	8.6	8.3	8.5	3	1.3	2.5	1.9	1	142.9	141.3	142.1	3	43.7	46.7	45	3.0	10.7	9.8	10.3	7	10.7	9.8	10.3	7	
101	1471	9.2	8.7	8.9	3	3.00	2.3	2.7	3	174.8	140.2	157.5	5	52.0	53.0	53	7	6.7	8.1	7.4	3	6.7	8.1	7.4	3	
102	1485	8.4	8.1	8.2	3	2.10	2.5	2.3	3	117.9	114.8	116.3	3	43.0	47.0	45	3	13.4	11.0	12.2	7	13.4	11.0	12.2	7	
103	1486	7.2	7.8	7.5	3	2.15	2.4	2.3	3	99.3	109.7	104.5	3	42.0	46.0	44	3	14.2	11.7	12.9	7	14.2	11.7	12.9	7	
104	1501	9.5	8.5	9.0	3	1.85	1.7	1.8	1	154.6	144.9	149.8	3	45.5	48.5	47	5	13.6	11.7	12.7	7	13.6	11.7	12.7	7	
105	1503	8.5	8.0	8.2	3	2.65	3.1	2.9	3	133.6	132.3	132.9	3	43.5	47.0	45	3	8.3	8.8	8.6	5	8.3	8.8	8.6	5	

Annexure III.

S.No	IPC No.	Leaf Sheath Length (cm)			Leaf Blade Length (cm)			Leaf Blade Width (cm)			Panicle Length (cm)			Panicle Diameter (cm)							
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	Node*				
106	1518	11.7	12.3	12.0	5	63.0	65.4	64.2	7	3.01	3.5	3.3	5	20.8	20.2	20.5	5	3.1	3.1	3.1	7
107	1536	9.4	10.1	9.7	3	53.2	56.1	54.6	5	3.93	4.6	4.3	7	21.3	22.9	22.1	5	3.3	3.4	3.3	7
108	1538	11.5	11.5	11.5	5	58.3	59.9	59.1	5	3.76	4.2	4.0	5	15.6	16.3	15.9	3	3.0	3.0	3.0	7
109	1551	12.6	12.0	12.3	5	48.1	45.2	46.7	3	2.56	2.5	2.6	3	17.7	17.9	17.8	3	2.6	2.5	2.6	5
110	1583	10.0	11.0	10.5	3	54.0	53.8	53.9	5	2.60	2.5	2.5	3	16.0	16.3	16.2	3	2.3	2.2	2.3	5
111	1590	14.2	13.9	14.1	5	56.1	55.1	55.6	5	3.92	3.9	3.9	5	19.8	19.8	19.8	3	2.5	2.3	2.4	5
112	1617	10.5	10.5	10.5	3	61.0	54.2	57.6	5	2.60	2.3	2.4	3	17.0	15.5	16.2	3	2.3	2.0	2.2	5
113	1642	14.2	13.7	13.9	5	69.4	63.9	66.6	7	3.47	3.7	3.6	5	17.6	17.8	17.7	3	3.1	4.5	3.8	7
114	1650	10.9	10.9	10.9	3	59.0	56.1	57.5	5	3.32	3.1	3.2	5	14.8	16.6	15.7	3	2.5	2.4	2.4	5
	Mean	12.2	12.4	12.3	-	58.0	57.3	57.6	-	3.2	3.1	3.2	-	19.1	19.2	19.2	-	2.4	2.3	2.3	-
	SE±	0.3	0.3			1.5	1.3			0.2	0.2			0.8	0.6			0.1	0.1		

Annexure III.																					
S.No	IPC No.	Number of Nodes Per Plant				Number of Productive Tillers				Plant Height (Excl.spike) (cm)				Time to 50% flowering			1000-Grain Weight (g)				
		E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*	E1	E2	Mean	Node*
106	1518	9.7	9.8	9.7	3	1.55	1.5	1.5	1	136.9	135.8	136.4	3	47.5	52.5	50	5	14.7	12.8	13.7	7
107	1536	8.8	7.6	8.2	3	1.10	1.2	1.1	1	141.7	131.9	136.8	3	47.0	46.5	47	3	12.0	12.3	12.1	7
108	1538	9.0	9.2	9.1	3	2.05	1.8	1.9	1	162.9	162.5	162.7	5	48.0	54.0	51	7	12.6	11.7	12.1	7
109	1551	8.2	7.7	7.9	3	2.35	3.0	2.7	3	99.1	110.1	104.6	3	40.0	45.0	43	1	11.0	11.5	11.3	7
110	1583	9.0	9.2	9.1	3	2.10	2.4	2.2	3	128.2	120.0	124.1	3	47.0	51.5	49	5	9.1	9.4	9.2	5
111	1590	8.2	8.0	8.1	3	2.50	2.4	2.5	3	173.7	163.0	168.4	5	47.5	50.5	49	5	11.4	11.9	11.6	7
112	1617	10.1	8.3	9.2	3	2.60	3.9	3.2	3	170.1	140.0	155.0	5	45.5	41.5	44	3	9.7	8.5	9.1	5
113	1642	9.0	8.7	8.8	3	2.30	2.6	2.4	3	160.6	152.7	156.6	5	45.0	46.0	46	3	13.1	13.1	13.1	7
114	1650	9.8	8.4	9.1	3	2.35	2.3	2.3	3	162.9	144.7	153.8	5	49.5	48.5	49	5	10.0	8.1	9.0	5
	Mean	8.9	8.3	8.6	-	2.2	2.2	2.2	-	147.4	134.3	140.8	-	47.9	49.9	48.9	-	9.0	8.9	9.0	-
	SE±	0.2	0.1			0.3	0.3			3.3	4.2			0.6	0.7			0.5	0.4		

E1: Mean data of 2007 rainy season

E2: Mean data of 2008 post-rainy season

*: Refer to Annexure I



Annexure III.

S.No	IPC No.	Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color					
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
1	21	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	4	4	4	4	4	1	1	1	-	-	-
2	74	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	5	5	5	5	5	1	1	1	-	-	-
3	94	1	1	1	1	1	1	9	9	9	2	2	2	2	5	5	5	4	4	4	4	4	1	1	1	-	-	-
4	98	1	1	1	1	1	1	1	1	1	1	1	1	1	7	7	7	4	4	4	4	4	1	1	1	-	-	-
5	100	1	1	1	1	1	1	9	9	9	2	2	2	2	3	3	3	4	4	4	4	4	1	1	1	-	-	-
6	107	1	1	1	1	1	1	1	1	1	2	2	2	2	5 ^a	5 ^a	3-5	4	4	4	4	4	9	9	9	2 ^a	2 ^a	1-2
7	186	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	5	4	4	4	4	4	1	1	1	-	-	-
8	244	1	1	1	2	2	2	1	1	1	1	2	2	2	5 ^a	5 ^a	5-7	1	1	1	1	1	1	1	1	-	-	-
9	329	1	1	1	1	1	1	9	9	9	2	2	2	2	5	5	5	4	4	4	4	4	1	1	1	-	-	-
10	337	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	5	5	5	5	5	1	1	1	-	-	-
11	338	1	1	1	2	2	2	1	1	1	2	2	2	2	5	5	5	5	5	5	5	5	1	1	1	-	-	-
12	367	1	1	1	1	1	1	1	1	1	2	2	2	2	5 ^a	5 ^a	5-7	4	4	4	4	4	1	1	1	-	-	-
13	388	9	9	9	2	2	2	1	1	1	2	2	2	2	7	7	7	4	4	4	4	4	1	1	1	-	-	-
14	390	1	1	1	1	1	1	1	1	1	2	2	2	2	3 ^a	3 ^a	3-5	4	4	4	4	4	1	1	1	-	-	-
15	404	1	1	1	2	2	2	1	1	1	2	2	2	2	7	7	7	4	4	4	4	4	1	1	1	-	-	-
16	406	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	4	4	4	4	4	1	1	1	-	-	-
17	408	9 ^a	9 ^a	1-9	2	2	2	9	9	9	1	1	1	1	5	5	5	1	1	1	1	1	9	9	9	4	4	4

Annexure III.

S.No	IPC No.	Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color			
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	
18	417	9	9	9	1	1	1	1	1	1	2	2	2	5 ^a	5-7	4	4	4	4	4	1	1	1	-	-	-
19	419	9	9	9	1	1	1	9	9	9	2	2	2	3 ^a	3-5	4	4	4	4	4	1	1	1	-	-	-
20	422	9	9	9	1	1	1	1	1	1	2	2	2	5	5	4	4	4	4	4	1	1	1	-	-	-
21	458	9	9	9	2	2	2	1	1	1	2	2	2	5	5	4	4	4	4	4	1	1	1	-	-	-
22	487	9	9	9	2	2	2	1	1	1	1	1	1	7	7	4	4	4	4	4	1	1	1	-	-	-
23	492	1	1	1	1	1	1	1	1	1	2	2	2	7 ^a	5-7	4	4	4	4	4	1	1	1	-	-	-
24	511	1	1	1	1	1	1	1	1	1	1	1	1	5	5	1	1	1	1	1	1	1	1	-	-	-
25	536	9	9	9	2	2	2	1	1	1	1	1	1	7	7	4	4	4	4	4	1	1	1	-	-	-
26	569	9	9	9	1	1	1	1	1	1	2	2	2	5	5	1	1	1	1	1	1	1	1	-	-	-
27	577	1	1	1	1	1	1	1	1	1	2	2	2	5	5	4	4	4	4	4	1	1	1	-	-	-
28	616	9	9	9	2	2	2	1	1	1	1	1	1	5	5	4	4	4	4	4	1	1	1	-	-	-
29	632	1	1	1	2	2	2	1	1	1	2	2	2	7	7	4	4	4	4	4	1	1	1	-	-	-
30	645	9	9	9	2	2	2	1	1	1	1	1	1	7	7	4	4	4	4	4	1	1	1	-	-	-
31	655	1	1	1	1	1	1	1	1	1	2	2	2	5	5	4	4	4	4	4	1	1	1	-	-	-
32	687	1	1	1	1	1	1	1	1	1	1	1	1	7 ^a	3-7	1	1	1	1	1	1	1	1	-	-	-
33	689	9	9	9	2	2	2	1	1	1	2	2	2	7 ^a	3-7	4	4	4	4	4	1	1	1	-	-	-
34	701	1	1	1	2	2	2	1	1	1	1	1	1	7	7	4	4	4	4	4	1	1	1	-	-	-



Annexure III.

S.No	IPC No.	Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color								
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean			
35	715	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	1	1	1	1	1	1	-	-	-
36	716	9	9	9	2	2	2	1	1	1	1	2	2	2	5	5	5	5	5	5	5	5	1	1	1	1	1	1	-	-	-
37	735	1	1	1	2	2	2	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	1	1	1	1	1	1	-	-	-
38	736	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	5	4	4	4	4	4	1	1	1	1	1	1	-	-	-
39	774	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4	4	4	4	1	1	1	1	1	1	-	-	-
40	795	1	1	1	1	1	1	1	1	1	1	1	1	1	7	7	7	1	1	1	1	1	1	1	1	1	1	1	-	-	-
41	802	9	9	9	2	2	2	1	1	1	1	2	2	2	5	5	5	5	5	5	5	5	1	1	1	1	1	1	-	-	-
42	804	9	9	9	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	9	9	9	9	9	2	2	2	2
43	809	9 ^a	9 ^a	1-9	2	2	2	1	1	1	1	2	2	2	7 ^a	7 ^a	3-7	4	4	4	4	4	1	1	1	1	1	1	-	-	-
44	811	9	9	9	2	2	2	9	9	9	1	1	1	1	5	5	5	4	4	4	4	4	1	1	1	1	1	1	-	-	-
45	821	9	9	9	1	1	1	1	1	1	1	1	1	1	5	5	5	5	5	5	5	5	1	1	1	1	1	1	-	-	-
46	827	9	9	9	2	2	2	9	9	9	1	1	1	1	3	3	3	1	1	1	1	1	1	1	1	1	1	1	-	-	-
47	828	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	1	1	1	1	1	1	1	1	1	1	1	-	-	-
48	835	1	1	1	1	1	1	1	1	1	1	1	1	1	5 ^a	5 ^a	5-7	4	4	4	4	4	1	1	1	1	1	1	-	-	-
49	843	1	1	1	1	1	1	1	1	1	1	2	2	2	5 ^a	5 ^a	5-7	4	4	4	4	4	1	1	1	1	1	1	-	-	-
50	873	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	1	1	1	1	1	1	1	1	1	1	1	-	-	-
51	882	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	1	1	1	1	1	1	-	-	-

IPC		Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color			
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	
52	896	9	9	9	2	2	2	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	1	1	-	-
53	909	1	1	1	1	1	1	1	1	1	2	2	2	5 ^a	5 ^a	5-9	4	4	4	1	1	1	1	1	-	-
54	931	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	1	1	-	-
55	954	9 ^a	9 ^a	1-9	1	1	1	1	1	1	2	2	2	9	9	9	1	1	1	1	1	1	1	1	-	-
56	957	1	1	1	1	1	1	1	1	1	1	1	1	7	7	7	4	4	4	1	1	1	1	1	-	-
57	962	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	1	1	-	-
58	974	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	1	1	1	1	1	1	1	1	-	-
59	976	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	1	1	1	1	1	1	1	1	-	-
60	989	9	9	9	1	1	1	1	1	1	1	1	1	5	5	5	4	4	4	1	1	1	1	1	-	-
61	990	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	1	1	1	1	1	1	1	1	-	-
62	991	9 ^a	9 ^a	1-9	1	1	1	1	1	1	1	1	1	3	3	3	5	5	5	1	1	1	1	1	-	-
63	992	9 ^a	9 ^a	1-9	1	1	1	1	1	1	1	1	1	3	3	3	4	4	4	1	1	1	1	1	-	-
64	997	9	9	9	2	2	2	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	1	1	-	-
65	999	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	1	1	-	-
66	1000	1	1	1	1	1	1	1	1	1	2 ^a	2 ^a	1-2	5	5	5	4	4	4	1	1	1	1	1	-	-
67	1002	9	9	9	2	2	2	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	1	1	-	-
68	1018	9	9	9	3	3	3	1	1	1	1	1	1	5	5	5	1	1	1	1	1	1	1	1	-	-

Annexure III.



IPC		Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color			
		S.No	No.	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2
69	1025	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	-	-	-
70	1027	1 ^a	1 ^a	1-9	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-
71	1040	1	1	1	1	1	1	1	1	1	1	1	1	1	7	7	7	1	1	1	1	1	1	-	-	-
72	1043	1	1	1	1	1	1	1	1	1	1	2	2	2	1-3	1-3	1-3	4	4	4	9	9	9	2	2	2
73	1046	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	5	1	1	1	1	1	1	-	-	-
74	1047	1	1	1	1	1	1	1	1	1	1	2	2	2	9	9	9	1	1	1	1	1	1	-	-	-
75	1062	1	1	1	1	1	1	1	1	1	1	1	1	1	3 ^a	3 ^a	3-5	1	1	1	1	1	1	-	-	-
76	1078	9	9	9	1	1	1	1	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	-	-	-
77	1097	9	9	9	2	2	2	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-
78	1104	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	1	1	1	-	-	-
79	1108	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	1	1	1	1	1	1	-	-	-
80	1114	9	9	9	3	3	3	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-
81	1178	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	-	-	-
82	1189	9	9	9	1	1	1	1	1	1	1	2	2	2	7	7	7	4	4	4	1	1	1	-	-	-
83	1254	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	-	-	-
84	1268	9 ^a	9 ^a	1-9	2	2	2	1	1	1	1	2	2	2	9	9	9	1	1	1	1	1	1	-	-	-
85	1306	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-

Annexure III.

Annexure III.

S.No	IPC No.	Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color				
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean		
86	1307	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-	
87	1309	1	1	1	1	1	1	1	1	1	1	2	2	2	5 ^a	5 ^a	5-7	4	4	4	1	1	1	-	-	-	
88	1318	9	9	9	1	1	1	1	1	1	1	2	2	2	7	7	7	4	4	4	1	1	1	-	-	-	
89	1329	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-	
90	1351	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-	
91	1354	1	1	1	1	1	1	9	9	9	2	2	2	3	3	3	4	4	4	1	1	1	-	-	-		
92	1356	1 ^a	1 ^a	1-9	2	2	2	1	1	1	1	1	1	1	1	5	5	5	5	5	5	1	1	1	-	-	-
93	1360	9	9	9	1	1	1	1	1	1	1	2	2	2	5	5	5	5	5	5	1	1	1	-	-	-	
94	1443	1	1	1	2	2	2	1	1	1	1	2	2	2	5	5	5	1	1	1	1	1	1	-	-	-	
95	1444	9 ^a	9 ^a	1-9	1	1	1	1	1	1	1	2	2	2	7	7	7	4	4	4	1	1	1	-	-	-	
96	1445	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4	4	1	1	1	-	-	-	
97	1446	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	1	1	1	1	1	1	-	-	-	
98	1447	9 ^a	9 ^a	1-9	2	2	2	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-	
99	1466	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	4	4	4	1	1	1	-	-	-	
100	1470	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	1	1	1	-	-	-	
101	1471	1 ^a	1 ^a	1-9	1	1	1	1	1	1	1	2	2	2	5 ^a	5 ^a	3-5	4	4	4	1	1	1	-	-	-	
102	1485	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4	4	1	1	1	-	-	-	



Annexure III.

S.No	IPC No.	Seedling: anthocyanin coloration of first leaf sheath			Panicle Anther Color			Panicle: Anthocyanin Pigmentation of Glume			Panicle Exertion			Panicle Density			Panicle Shape			Panicle: Bristle			Panicle: Bristle Color									
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean				
103	1486	1	1	1	1	1	1	1	1	1	1	2	2	2	3 ^a	3 ^a	3-5	4	4	4	4	4	4	1	1	1	1	1	1	-	-	-
104	1501	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	1	1	1	1	1	1	1	1	1	1	1	-	-	-	
105	1503	9	9	9	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	4	1	1	1	1	1	-	-	-	
106	1518	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	1	1	1	1	1	1	1	1	1	1	1	-	-	-	
107	1536	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	5	5	5	5	5	5	5	1	1	1	1	1	-	-	-	
108	1538	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	2	2	2	2	2	2	1	1	1	1	1	-	-	-	
109	1551	9	9	9	2	2	2	1	1	1	1	2	2	2	3 ^a	3 ^a	3-5	4	4	4	4	4	4	1	1	1	1	1	-	-	-	
110	1583	1	1	1	1	1	1	1	1	1	1	2	2	2	7	7	7	4	4	4	4	4	4	1	1	1	1	1	-	-	-	
111	1590	9 ^a	9 ^a	1-9	2	2	2	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	4	1	1	1	1	1	-	-	-	
112	1617	1	1	1	1	1	1	1	1	1	1	2	2	2	5	5	5	4	4	4	4	4	4	9	9	9	1	1	1	1	1	
113	1642	1	1	1	2	2	2	1	1	1	1	2	2	2	3	3	3	4	4	4	4	4	4	1	1	1	1	1	-	-	-	
114	1650	1 ^a	1 ^a	1-9	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4	4	4	4	4	1	1	1	1	1	-	-	-	

Annexure III.

S.No	IPC No.	Panicke: Tip Sterility			Seed Color			Seed Shape			Plant: Growth Habit			Leaf Sheath Pubescence			Plant Node Pubescence			Plant Node Pigmentation			Plant Internode Pigmentation		
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
1	21	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	1	4	4	4	2	2	2
2	74	9	9	9	4	4	4	4	4	4	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
3	94	1	1	1	4	4	4	4	4	4	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
4	98	1	1	1	4	4	4	4	4	4	5	5	5	9	9	9	9	9	2	2	2	2	2	2	2
5	100	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
6	107	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
7	186	1	1	1	4	4	4	4	4	4	1	1	1	1	1	1	1	1	3	3	3	2	2	2	2
8	244	1	1	1	2	2	2	1	1	1	1 ^a	1 ^a	1-5	1	1	1	1	1	2	2	2	2	2	2	2
9	329	9	9	9	2	2	2	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
10	337	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
11	338	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
12	367	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
13	388	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
14	390	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	4	4	4	2	2	2	2
15	404	1	1	1	5	5	5	4	4	4	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
16	406	9	9	9	2	2	2	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
17	408	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
18	417	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	4	4	4	2	2	2	2
19	419	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	1	1	4	4	4	2	2	2	2



Annexure III.

S.No	IPC No.	Panicke: Tip Sterility			Seed Color			Seed Shape			Plant: Growth Habit			Leaf Sheath Pubescence			Plant Node Pubescence			Plant Node Pigmentation			Plant Internode Pigmentation		
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
20	422	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	1	4	4	4	2	2	2
21	458	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	3	3	3	2	2	2	
22	487	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	4	4	4	2	2	2	
23	492	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
24	511	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
25	536	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	
26	569	1	1	1	4	4	4	1	1	1	1	1	1	9	9	9	1	1	2	2	2	2	2	2	
27	577	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
28	616	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	5	5	5	2	2	2	
29	632	9	9	9	5	5	5	1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4	4	
30	645	1	1	1	4	4	4	1	1	1	5	5	5	9	9	9	1	1	4	4	4	2	2	2	
31	655	1	1	1	4	4	4	4	4	4	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
32	687	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
33	689	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	3	3	3	2	2	2	
34	701	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
35	715	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
36	716	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	
37	735	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	
38	736	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	

Annexure III.

S.No	IPC No.	Panicke: Tip Sterility			Seed Color			Seed Shape			Plant: Growth Habit			Leaf Sheath Pubescence			Plant Node Pubescence			Plant Node Pigmentation			Plant Internode Pigmentation		
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
39	774	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	1	3	3	3	2	2	2
40	795	1	1	1	2	2	2	1	1	1	5	5	5	1	1	1	9	9	9	2	2	2	2	2	2
41	802	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	1	1	1	4	4	4	2	2	2
42	804	9	9	9	4	4	4	4	4	4	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
43	809	1	1	1	2	2	2	1	1	1	5	5	5	1	1	1	9	9	9	4	4	4	2	2	2
44	811	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	1	4	4	4	2	2	2
45	821	9	9	9	4	4	4	4	4	4	5	5	5	1	1	1	1	1	1	3	3	3	2	2	2
46	827	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	1	4	4	4	4	4	4
47	828	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	1	2	2	2	2	2	2
48	835	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	1	2	2	2	2	2	2
49	843	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
50	873	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
51	882	1	1	1	4	4	4	1	1	1	1	1	1	9	9	9	1	1	1	2	2	2	2	2	2
52	896	1	1	1	4	4	4	2	2	2	5	5	5	1	1	1	9	9	9	3	3	3	2	2	2
53	909	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	2	2	2
54	931	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	9	9	9	3	3	3	2	2	2
55	954	1	1	1	5	5	5	1	1	1	5	5	5	1	1	1	1	1	1	2	2	2	2	2	2
56	957	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	1	2	2	2	2	2	2
57	962	1	1	1	4	4	4	1	1	1	1	1	1	9	9	9	1	1	1	2	2	2	2	2	2



Annexure III.

S.No	IPC No.	Panicle: Tip Sterility			Seed Color			Seed Shape			Plant: Growth Habit			Leaf Sheath Pubescence			Plant Node Pubescence			Plant Node Pigmentation			Plant Internode Pigmentation		
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
58	974	1	1	1	2	2	2	1	1	1	5	5	5	9	9	9	1	1	1	2	2	2	2	2	2
59	976	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	4 ^a	4 ^a	3-4	2	2	2	2
60	989	1	1	1	5	5	5	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
61	990	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
62	991	1	1	1	4	4	4	2	2	2	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
63	992	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
64	997	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
65	999	1	1	1	4	4	4	1	1	1	5	5	5	9	9	9	1	1	2	2	2	2	2	2	2
66	1000	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	9	9	4	4	4	2	2	2	2
67	1002	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	9	9	2	2	2	2	2	2	2
68	1018	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	9	9	2	2	2	2	2	2	2
69	1025	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
70	1027	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
71	1040	1	1	1	5	5	5	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
72	1043	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
73	1046	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
74	1047	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
75	1062	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
76	1078	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2

IPC		Panicke: Tip Sterility			Seed Color			Seed Shape			Plant: Growth Habit			Leaf Sheath Pubescence			Plant Node Pubescence			Plant Node Pigmentation			Plant Internode Pigmentation		
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
77	1097	1	1	1	2	2	2	1	1	1	5	5	5	1	1	1	1	1	1	2	2	2	2	2	2
78	1104	1	1	1	4 ^a	2-4	4	4	4	5	5	5	1	1	1	1	1	1	2	2	2	2	2	2	2
79	1108	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
80	1114	1	1	1	2	2	2	4	4	4	1	1	1	1	1	1	1	1	3	3	3	2	2	2	2
81	1178	1	1	1	5	5	5	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
82	1189	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	9	9	2	2	2	2	2	2	2
83	1254	1	1	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
84	1268	1	1	1	4	4	4	3	3	3	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
85	1306	1	1	1	5	5	5	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
86	1307	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
87	1309	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	9	9	3	3	3	2	2	2	2
88	1318	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
89	1329	9	9	9	2	2	2	1	1	1	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
90	1351	9	9	9	2	2	2	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
91	1354	1	1	1	2	2	2	4	4	4	5	5	5	1	1	1	1	1	3	3	3	2	2	2	2
92	1356	9	9	9	4	4	4	1	1	1	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
93	1360	1	1	1	4	4	4	1	1	1	5	5	5	1	1	1	1	1	4	4	4	2	2	2	2
94	1443	1	1	1	4	4	4	4	4	4	5	5	5	1	1	1	1	1	2	2	2	2	2	2	2
95	1444	1	1	1	4	4	4	3	3	3	5	5	5	1	1	1	1	1	4	4	4	2	2	2	2

Annexure III.



Annexure III.

S.No	IPC No.	Panicke: Tip Sterility			Seed Color			Seed Shape			Plant: Growth Habit			Leaf Sheath Pubescence			Plant Node Pubescence			Plant Node Pigmentation			Plant Internode Pigmentation		
		E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean	E1	E2	Mean
96	1445	1	1	2	2	2	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97	1446	1	1	1	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
98	1447	1	1	1	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
99	1466	9	9	9	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1470	1	1	1	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
101	1471	1	1	1	4	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
102	1485	9	9	9	4	4	4	4	4	1	1	1	9	9	9	1	1	1	1	1	1	1	1	1	1
103	1486	9	9	9	4	4	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
104	1501	1	1	1	4	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
105	1503	1	1	1	4	4	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
106	1518	1	1	1	4	4	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
107	1536	1	1	1	4	4	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
108	1538	1	1	1	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
109	1551	1	1	1	4	4	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1583	1	1	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
111	1590	1	1	1	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
112	1617	1	1	1	4 ^a	4 ^a	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
113	1642	9	9	9	4	4	4	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1
114	1650	1	1	1	4	4	1	1	1	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1

E1: Mean data of 2007 rainy season; E2: Mean data of 2008 post-rainy season

^apredominant class but also indicates the presence of other classes

Key Characteristics of Restorer Parents

Restorer parent

IPC-21 : WC 2-8-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-74 : S38-142-1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Lanceolate
Compactness	Loose
Seed color	Grey
Seed shape	Globular
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-94 : EC-S3-211-1-2

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-98 : NW 15-18-44

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Partial

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

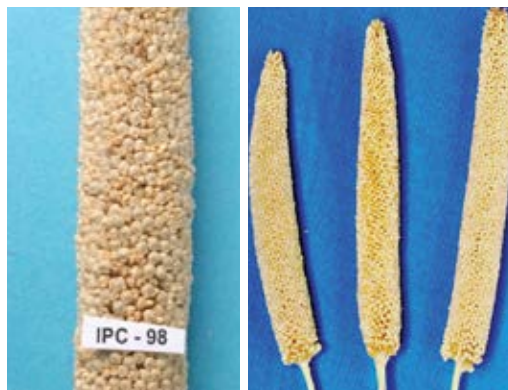
Panicle shape Candle

Compactness Compact

Seed color Grey

Seed shape Globular

1000-seed mass Small (5.0-7.5 gm)

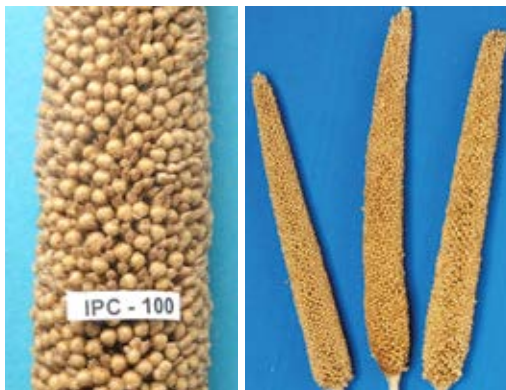


Restorer parent

IPC-100 : (T 166-2 x 700594-2-6)-90-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30) cm
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Cream
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-107 : LCSN 72-1-2-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

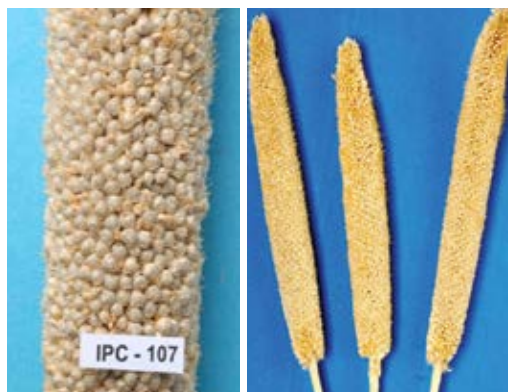
Panicle shape Candle

Compactness Loose-Semi Compact

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-186 : (J 260-1 x 700557-1-4-10-5-1-1)-2-2-1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-244 : (R 234 x R 238)-1

Key characteristics

Growth habit	Erect - Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Cream
Seed shape	Obovate
1000-seed mass	Bold (10.1-12.5 gm)

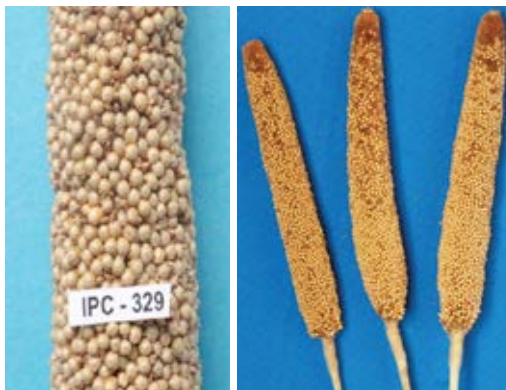


Restorer parent

IPC-329 : (S10LB-30 x LCSN 1225-6-3-1)-5-1-2-2

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Cream
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-337 : (5054B x F4FC 1498-1-1-2)-7-1-1-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Lanceolate
Compactness	Loose
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-338 : (LCSN 439-5-3-2 x Gulisitha)-6-1-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Brown

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Lanceolate

Compactness Semi-compact

Seed color Cream

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-367 : (E 298 x F4FC 1498-1-1-2)-6-3

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Semi-compact-Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Medium (7.6-10.0 gm)

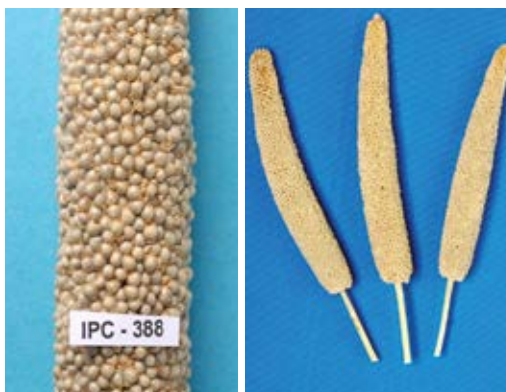


Restorer parent

IPC-388 : Togo 17-4-1-5

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Brown
Plant height	Short (101-105 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)

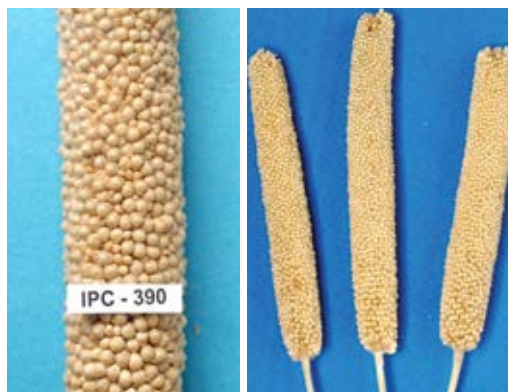


Restorer parent

IPC-390 : (F4FC 1498-1-1-3 x J 104)-11-2-1-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Short (101-105 cm)
Number of productive tillers	Medium (4-6 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Loose to Semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)

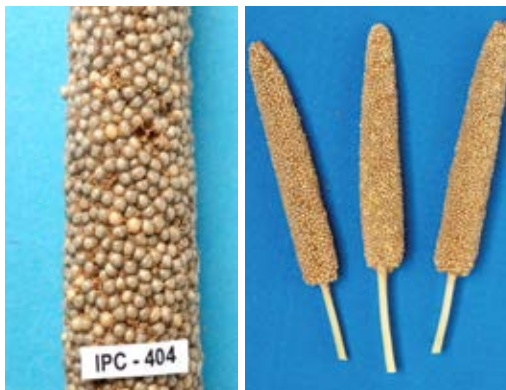


Restorer parent

IPC-404 : Togo 17-4-1-18

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Brown
Node pigmentation	Brown
Plant height	Short (101-105 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Deep grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-406 : (S10LB-30 X LCSN 1225-6-3-1)-5-1-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-105 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Loose

Seed color Cream

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-408: (S10LB-30 x LCSN 1225-6-3-1)-3-1-1-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Brown

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Thick (>3.0 cm)

Panicle shape Cylindrical

Compactness Semi-compact

Seed color Cream

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-417 : {G73-FS-41 x (J 1188 x Cassady)}-5-6-1-2

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi compact to Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-419 : (S10LB-30 x LCSN 1255-6-3-1)-3-1-1-4

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	loose to semi compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-422 : LCSN 72-1-2-1-1 (non-bristled)

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)

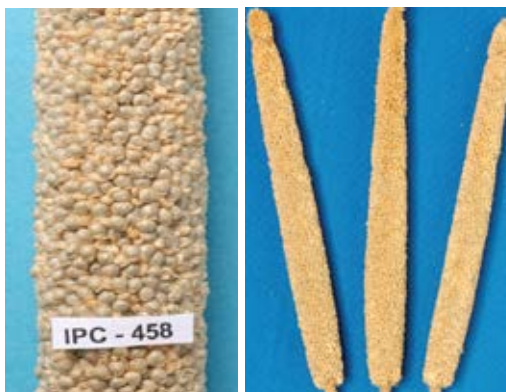


Restorer parent

IPC-458 : (J 260-1 x 700557-1-4-10-5-1)-1-2-2-1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Brown
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-487 : 8082-2-5-2

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Brown
Node pigmentation	Red
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Partial
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-492 : (B 282 x J 804-1-3-9)-7-2-2

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact to Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-511 : {(J 934-7 x 700544-7-2-1) x EC 298-2-1}-1-5

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-536 : (J 260-1 x 700557-1-4-10-5-1)-1-2-2-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Brown

Node pigmentation Brown

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-569 : {J 2002-1 x (J 934-7 x 700544-7-2-1)}-1-5-5

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-577 : {IP 2788 x (J 9347 x 700544-7-2-1)}-1-4-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-616 : (J 260-1 x 700557-1-4-10-5-1)-1-2-1-3

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Brown
Node pigmentation	Purple
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)

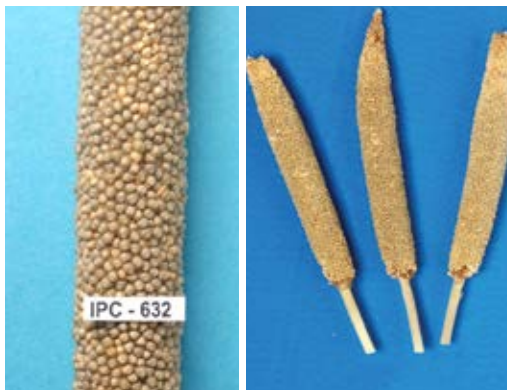


Restorer parent

IPC-632 : {(P 24 x IP 230)-1 x (A 836 x Serere 2A-3)-2}-1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Red
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Deep grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-645 : {(B 282 x J 104-1-3-11) x (SD2 x EB 2-5) (D 914-2-1)}-3-3

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Brown

Node pigmentation Red

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-655 : (B Senegal-2-5 X 700651)-2-1-4

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-687 : SC14(M)

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Very late (>54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	loose to compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-689 : R-294-1-2-8-2

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	loose to compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)

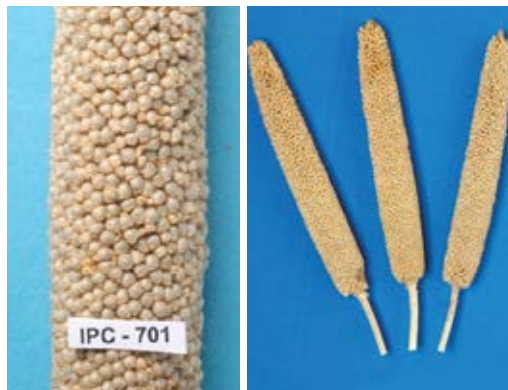


Restorer parent

IPC-701 : {(SD2 x EB 1) x (700797-2-3-1)}-5-3-5-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-715 : J 104 (DM res. Version)

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Very Small (<11 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-716 : (LCSN 282-4-1-1 x S10B-38)-15-2-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Lanceolate
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-735 : (J 1399-1 x B 282)-6-1-2-1-2

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Brown
Node pigmentation	Brown
Plant height	Very short (<101 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)

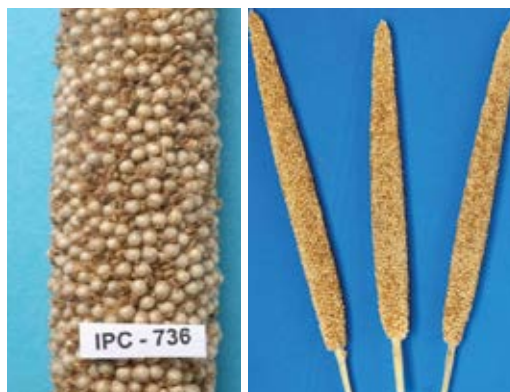


Restorer parent

IPC-736 : {(SC14(M) x (SD2 x EB 2) (D 1088-1))-64

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Very short (<101 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)

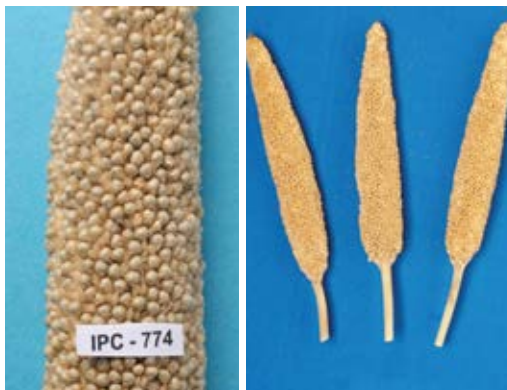


Restorer parent

IPC-774 : [{{(J934x700544+)x(J1644x700490+)}}x{G75-FS+x(J1623x700544+)}]-4+

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-795 : (LCSN 72-1-2-2 x S10B-106)-2-2-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Cylindrical

Compactness Compact

Seed color Cream

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-802 : (E 298 x LCSN 282-4-1-2)-12-2-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Brown

Node pigmentation Red

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Lanceolate

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-804 : (S10LB-30 x LCSN 1225-6-3-1)-1-2-1-1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-809 : (E 298 x LCSN 1173-1-9-3)-3-1-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Brown
Node pigmentation	Red
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	loose to compact
Seed color	Cream
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-811 : (B 282 x S10B-38)-6-1-1-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Red
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-821 : ICRC-F4-139

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Brown

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Lanceolate

Compactness Semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-827 : (5054B x F4FC 1498-1-1-1)-3-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Brown

Node pigmentation Red

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Thick (>3.0 cm)

Panicle shape Cylindrical

Compactness Loose

Seed color Cream

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-828 : (B 282 x S10B-38)-2-1-5-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Cylindrical

Compactness Loose

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-835 : (F4FC 1436-4-3-2 x J 104 ST)-22-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Semi-compact to compact

Seed color Grey

Seed shape Globular

1000-seed mass Medium (7.6-10.0 gm)



Restorer parent

IPC-843 : (J 834 x 700516)-1-4-4-2-4

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-105 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact to compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-873 : (B Senegal-2-5 x EC 298-2)-2-3-1-1-3

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-105 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-882 : (J 25-1 x J 1798)-1-1-16-4-2-2

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-105 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-896 : 8082-1-3-6-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Brown

Node pigmentation Brown

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3- tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Compact

Seed color Grey

Seed shape Elliptical

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-909 : (S10LB-30 x IP 944)-6-4-5

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact to very compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-931 : (F4FC 1498-1-1-1 x J 104)-6-1-2-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Brown

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3- tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Small (5.0-7.5 gm)

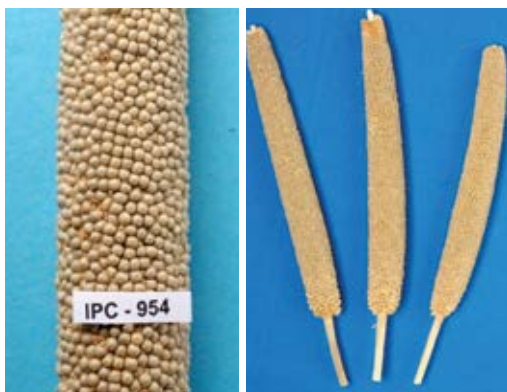


Restorer parent

IPC-954 : (E 298 x F4FC 1498-1-1-2)-5-3-3-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Very compact
Seed color	Deep grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-957 : [(700626-21) x (B 282-2-1 x 700651-1)]-4-7-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)

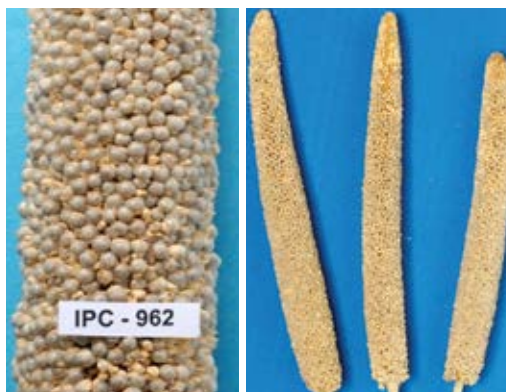


Restorer parent

IPC-962 : (A 836 x J 1798-32-2-2)-42-1-1-3

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-974 : [(J 25-1 x J 1798)-1-1]-85-1-1-3

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3- tillers)

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Semi-compact

Seed color Cream

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-976 : [(J 25-1 x J 1798)-1-1]-85-1-3-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Very late (> 54 days)

Anther color Yellow

Node pigmentation Brown to Red

Plant height Medium (4-6 tillers)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-989 : [(J 934-7 x 700544-7-2-1) x P 23]-10-4-4

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Very late (> 54 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Medium (4-6 tillers)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Deep grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-990 : J 834 x 700516-1-4-4-3-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Cream
Seed shape	Globular
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-991 : 8040-1-1-1-5

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Very early (<43 days)

Anther color Yellow

Node pigmentation Brown

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Partial

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Lanceolate

Compactness Loose

Seed color Grey

Seed shape Elliptical

1000-seed mass Medium (7.6-10.0 gm)



Restorer parent

IPC-992 : 8040-1-2-1-6

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-997 : 8082-1-3-5-5

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Brown

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Cylindrical

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-999 : 8082-1-3-6-3 (Duplicate 000897)

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3- tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1000 : [J 1798 x (J 934-7 x 700544-7-2-1)]-30-1-1-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Partial to complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-1002 : [J 1472 x (J 934-7 x 700544-7-2-1)]-3-3-2-4

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1018 : [700651 x (J 25-1 x 700797-4-1-4-1)]-3-3

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Very long (> 40 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1025 : [(J 1248 x 700112)-1 P-2]-31-1-1-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

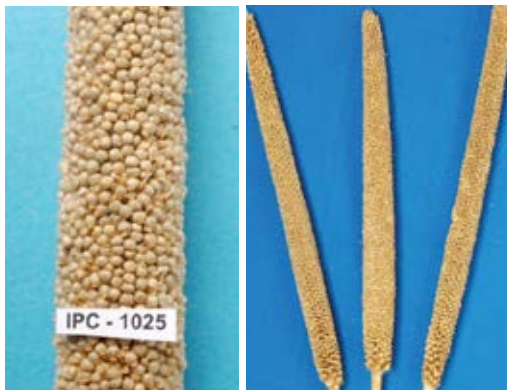
Panicle shape Cylindrical

Compactness Compact

Seed color Grey

Seed shape Globular

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1027 : [(J 25-1 x J 1798)-1-1]-24-2-1-3

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Medium (151-200 tillers)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-1040 : (700619 x 700599)-3-1-3-6-1-5

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Partial
Panicle length	Small (11-20 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Compact
Seed color	Deep grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1043 : [(J 934-7 x 700544-7-2-1) x (P 23)]-5-2-4

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Very loose to loose
Seed color	Cream
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1046 : [J 1623 x 700544-13-4-3-3-3]-2-1-6

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Very late (>54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1047 : [(J 1623 x 700490-2-6) x (EC 298-2-5-23)]-2-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Yellow

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Cylindrical

Compactness Very compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1062 : [700651 x (J 25-1 x 700797-4-1-4-1)]-4-4

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Loose to semi-compact
Seed color	Cream
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1078 : HMP 559-6

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Cylindrical
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1097 : (S10LB-30 x IP 944)-6-3-1-*

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Brown

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Cream

Seed shape Obovate

1000-seed mass Medium (7.6-10.0 gm)



Restorer parent

IPC-1104 : {700626-21 x (B 282-2-1 x 700651-1)}-4-5-3

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3- tillers)

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Very loose

Seed color Cream to grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1108 : [700651 x (J 25-1 x 700797-4-1-4-1)]-5-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Cylindrical

Compactness Loose

Seed color Cream

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1114 : (B 282 x J 804-1-3-4)-59-2-1-1 (Duplicate 001065)

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Very late (>40 cm)
Anther color	Purple
Node pigmentation	Brown
Plant height	Tall (201-250 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (1.6-3.0 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Cream
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1178 : (A 836 x J 1798-32-2-2)-5-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Very late (>54 days)

Anther color Yellow

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Compact

Seed color Deep grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1189 : [(L 108-1) x (J 937 x 700797-16-2-2)]-5-1-1 (Duplicate 001099)

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (1.6-3.0 cm)

Panicle shape Candle

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1254 : (700619 x 700599)-3-2-13-7-3-4

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Cylindrical
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1268 : 8082-1-3-4-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Brown

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Very compact

Seed color Grey

Seed shape Hexagonal

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1306 : (Tulaja-3 x LCSN 1173-1-9-3)-15-1-1-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Deep grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1307 : (LCSN 72-1-2-2 x S10B-106)-2-2-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Very late (>54 days)

Anther color Yellow

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

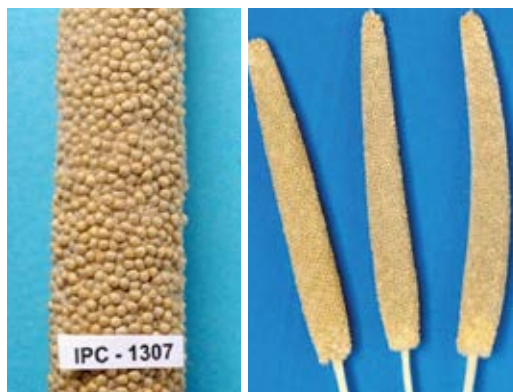
Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1309 : (F4FC 1498-1-1-3 X J 104 ST)-19-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Brown

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact to compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1318 : (J 1248 x 700112-1-2)-18-1-5

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1329 : (NEP 7-5603 x SS 48-40)-4-6

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Brown

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Cream

Seed shape Obovate

1000-seed mass Small (6.0-7.5 gm)



Restorer parent

IPC-1351 : (J 1623 x WC 6-1)-1-2-15-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Very short (<101 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm) -
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Cream
Seed shape	Globular
1000-seed mass	Small (6.0-7.5 gm)



Restorer parent

IPC-1354 : EICP 8103-5

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Cream
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1356 : (J 1248 x 700112-1-2)-18-1-2-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Brown

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Lanceolate

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1360 : (B 282 x S10B-38)-1-1-3-1

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3- tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Lanceolate
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1443 : (B 282 x S10B-38)-3-1-3-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Brown

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1444 : (B Senegal-2-5 x 700651)-2-1-1

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Red

Plant height Medium (151-200 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Compact

Seed color Grey

Seed shape Hexagonal

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1445 : K 560-230-33

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Very late (>54 days)
Anther color	Yellow
Node pigmentation	Brown
Plant height	Medium (151-200 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Cream
Seed shape	Globular
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-1446 : Souna B

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Medium (21-30 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Cylindrical

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1447 : B 282

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Very late (>54 days)
Anther color	Brown
Node pigmentation	Red
Plant height	Very short (<101 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1466 : H 77/833-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Small (5.0-7.5 gm)



Restorer parent

IPC-1470 : (B 282 x J 104)-12-B-B-B-B

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1471 : NELC 2074

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Late (51-54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	loose to semi-compact
Seed color	Grey
Seed shape	Globular
1000-seed mass	Small (5.0-7.5 gm)



Restorer parent

IPC-1485 : (842B x 3/4EB-100)-11-9-2-50-B-B-1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Grey
Seed shape	Globular
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-1486 : (842B x 3/4EB-100)-11-9-2-50-B-B-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness loose to semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1501 : [{{(J1623x700544+)x700651+}x{G73-FS-171x(J1623x700544+)}}]-10+

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21-30 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Cylindrical
Compactness	Loose
Seed color	Grey
Seed shape	Globular
1000-seed mass	Bold (10.1-12.5 gm)



Restorer parent

IPC-1503 : {K 560-2 x (J 934-7 x 700544-7-2-1)}-4-1-3-3-2-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Red

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Medium (7.6-10.0 gm)



Restorer parent

IPC-1518 : ICRC-F4-146-3

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Yellow

Node pigmentation Red

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Thick (>3.0 cm)

Panicle shape Cylindrical

Compactness Loose

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1536 : {(B 282 x S10B-38)-30-2-2-2 x Togo-29-2-2}-32-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Yellow

Node pigmentation Green

Plant height Short (101-150 cm)

Number of productive tillers Monoculm

Panicle exertion Partial

Panicle length Medium (21-30 cm)

Panicle girth Thick (>3.0 cm)

Panicle shape Lanceolate

Compactness Semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1538 : IP 9402-2-1-1-3

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Late (51-54 days)

Anther color Yellow

Node pigmentation Green

Plant height Medium (151-200 cm)

Number of productive tillers Monoculm

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Thick (>3.0 cm)

Panicle shape Conical

Compactness Compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1551 : {843B x (B 282 x S10LB-38)-30-2-1-1}-13-B-2

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Very early (<43 days)

Anther color Brown

Node pigmentation Red

Plant height Short (101-150 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness loose to semi-compact

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1583 : JRWS1P1

Key characteristics

Growth habit	Erect
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101-150 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Compact
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1590 : {(B 282x3/4EB-100-6-8)-2-5x(B 282x3/4EB-100-6-8)-2-1}-4-2-1-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Medium (47-50 days)

Anther color Brown

Node pigmentation Brown

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Medium (21-30 cm)

Panicle shape Candle

Compactness Semi-compact

Seed color Grey

Seed shape Obovate

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1617 : PPMWGI 1299

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Early (43-46 days)
Anther color	Yellow
Node pigmentation	Red
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Semi-compact
Seed color	Whitish to grey
Seed shape	Globular
1000-seed mass	Medium (7.6-10.0 gm)



Restorer parent

IPC-1642 : (23DBE-19-2 x S10B-106)-2-1-2-4

Key characteristics

Growth habit Intermediate

Maturity (Days to 50% flowering) Early (43-46 days)

Anther color Brown

Node pigmentation Red

Plant height Medium (151-200 cm)

Number of productive tillers Low (2-3 tillers)

Panicle exertion Complete

Panicle length Small (11-20 cm)

Panicle girth Thick (>3.0 cm)

Panicle shape Candle

Compactness Loose

Seed color Grey

Seed shape Globular

1000-seed mass Bold (10.1-12.5 gm)



Restorer parent

IPC-1650 : $\{[(J1623 \times 700544+) \times 700651+] \times [G75-FS-171 \times (J1623 \times 700544+)]\}+$

Key characteristics

Growth habit	Intermediate
Maturity (Days to 50% flowering)	Medium (47-50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151-200 cm)
Number of productive tillers	Low (2-3 tillers)
Panicle exertion	Complete
Panicle length	Small (11-20 cm)
Panicle girth	Medium (21-30 cm)
Panicle shape	Candle
Compactness	Loose
Seed color	Grey
Seed shape	Obovate
1000-seed mass	Medium (7.6-10.0 gm)





**International Crops Research Institute
for the Semi-Arid Tropics**



ICRISAT is a member
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We believe all **people** have a **right** to **nutritious food** and a **better livelihood**.

ICRISAT works in agricultural research for development across the drylands of Africa and Asia, making farming profitable for smallholder farmers while reducing malnutrition and environmental degradation.

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