

Characterization of ICRISAT Bred Pearl Millet Restorer Parents (2006-2019)



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Characterization of ICRISAT Bred Pearl Millet Restorer Parents (2006-2019)

Edited by

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Contents

Foreword.....	IV
Introduction.....	1
Material and Methods	1
Results and Discussion	4
References	6
Annexure I	7
Annexure II	10
Annexure III	15
Key Characteristics of Restorer Parents	31

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. 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 has aligned its research strategy for pearl millet in Asia with the regional priority of developing improved breeding lines and hybrid parents. Pearl millet productivity in India has increased from 0.4 to 0.5 tons per ha in 1960s to the present levels of about 1.4 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 the 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), there is a need 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.

The restorer parent breeding program at ICRISAT developed and designated 1,731 restorer lines during 1985–1995, of which promising 114 R-lines were characterized and documented earlier. The restorer breeding program, which was closed for about ten years in 1990s, was started again in response to request from the Scientist Field Day participants in 2000. The program has bred 144 R-lines between 2006 to 2019 and designated them. 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 were not evaluated for a comprehensive set of morphological traits in common environments until now. Thus, the objective of the present study was to characterize these promising 114 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 food and nutritional security together with our partners in hybrid development and seed production around the globe.



Dr Jacqueline d'Arros Hughes

Director General, ICRISAT

Introduction

Pearl millet (*Pennisetum glaucum* (L) R. Br.) is a major warm-season “nutricereal” grown on ~34 million ha across the world with majority of area (>95%) in the arid and semi-arid tropical (SAT) regions of Asia (~11 million ha) and Africa (~22 million ha) (FAO, 2020). India being the largest producer with an average production of 8.61 million tonnes and productivity of 1243 kg ha⁻¹ occupies an area of 6.93 million ha (Directorate of Millets Development, 2020). It is a highly cross-pollinated crop with an outcrossing rate of more than 85%. The protogynous flowering and wind-borne pollination favors cross-pollination, making open-pollinated varieties (OPVs) as the natural cultivar state of this crop. OPVs, however, are not amenable to achieving as much heterozygosity and the consequent heterosis as it is possible in single-cross hybrids. Furthermore, OPVs are highly heterogeneous and hence morphologically more variable than single-cross hybrids. It has been observed that single-cross hybrids generally give 20-30% more grain yield than OPVs (Rai et al. 2006). Based on these considerations, and with the availability of a commercially exploitable cytoplasmic-nuclear male sterility (CMS), the National Agricultural Research System (NARS) in India took the first significant step in the world to embark on grain hybrid development. With the rapid growth of a vibrant seed industry, pearl millet research in India, both in the private and the public sector, is now almost all directed towards hybrid breeding. In alignment with the regional priority in Asia region, ICRISAT’s pearl millet improvement research at Patancheru playing a pivotal role in developing diverse range of improved breeding lines and potential hybrid parents, leaving the development, testing and release of hybrids to the NARS and the private sector.

There has been extensive use of ICRISAT-bred hybrid parents, especially seed parents (male-sterile A-line) and restorers (R-line), by both NARS and the private sector. Through ICAR-All India Coordinated Research Project on Pearl millet, a total of 175 hybrids (101 from public sector and 74 private sectors) and 62 varieties were identified and released for cultivation in different agro-ecological zones of the country (Project coordinator review, ICAR-AICRP on pearl millet, 2020). Among them, 60-70% of the pearl millet hybrids grown in India are based on ICRISAT-bred A-lines, or on proprietary A-lines developed from improved lines bred at ICRISAT (<https://www.icrisat.org/pearl-millet/>). This shows that ICRISAT is playing a pioneer role in pearl millet improvement program. The ICRISAT-bred 99 A/B pairs developed during 1981 to 2004 were earlier characterized for DUS traits (Rai et al. 2009)

The breeding program for the development of restorer parents runs parallel to the seed parent development program and working in this direction 1731 restorer lines developed and designated during the period of 1985-2008 are well documented (Talukdar et al., 1995) and some of these selected promising restorer lines (114 R-lines) were characterized (Gupta et al., 2011) using DUS (Distinctness, Uniformity and Stability) descriptors. In view of the increasing awareness of Intellectual Property Rights (IPR) protection, it is necessary to periodically characterize the ICRISAT-bred parental lines 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 by public organizations globally. Thus, the objective of the present study was to characterize the set of 122 restorer lines developed and designated during 2006 to 2019 using 17 out of 26 morphological traits designated 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, 122 restorer lines were developed and designated during the period 2006 to 2019. R-lines are designated with a 5- digit system since 2006, where the first two digits refer to the year in which they are designated and made available for use, followed by three digits (the same number in triplicate) for specific R-line. For example, ICMR 15666 refers to the sixth R-line developed and designated in 2015 and ICMR 06555 refers to the fifth R-line developed and designated

in 2006 (Annexure II). Prior to 2006, the R-lines were designated as IPC (ICRISAT Pollinator Collection) followed by a specific number given to the line at ICRISAT. For instance, IPC 412, IPC 809 etc.

Restorers have been bred at ICRISAT using the ear to-row method followed by their maintenance through bulking 10-15 phenotypically similar looking plants/season. Most of these 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. These lines were designated and disseminated as potential hybrid parents after evaluating them for their agronomic performance and for having resistance to at least two virulent isolates (screening is done against 5 isolates) of downy mildew (caused by *Sclerospora graminicola*), the most dreadful disease of pearl millet in India. All these R-lines are being maintained in medium term cold storage at ICRISAT. These 122 restorer lines were planted in a randomized complete block design with two replications during 2020 summer (February-May) and rainy (August-December) at ICRISAT, Patancheru (18° N lat.; 78° E long.). During the summer, there was a total rainfall of 110.68 mm with the weekly mean maximum temperatures ranging between 32.54 and 42.22 °C, weekly mean minimum temperatures ranging between 16.74 and 26.08 °C and relative humidity above 79% (Fig. 1). During the rainy, there was a total of 644.28 mm rainfall with the weekly mean maximum temperatures ranging between 27.62 and 33.14 °C, weekly mean minimum temperatures ranging between 10.97 and 23.19 °C and relative humidity > 92% (Fig. 2).

Each line was machine-planted in a single row of 4 m with 60 cm spacing between the rows in summer and 75 cm in rainy, 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.

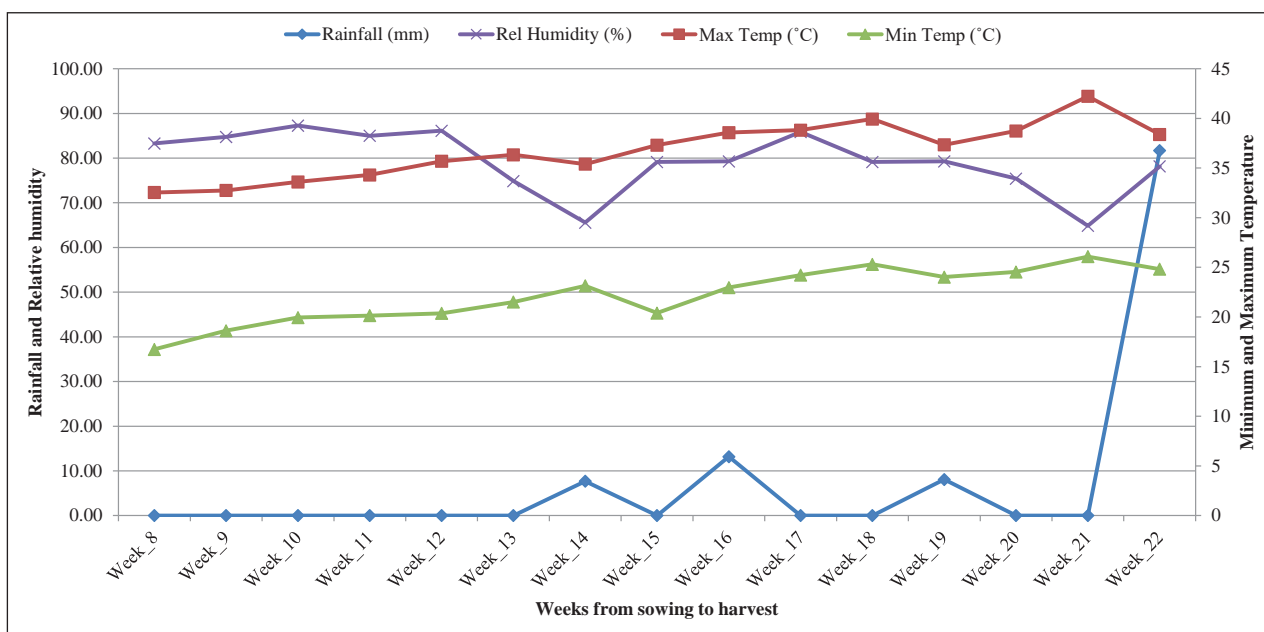


Figure 1. Weekly distribution of rainfall (mm), maximum and minimum temperature (°C) and relative humidity (%) during 2020 summer season, ICRISAT, Patancheru.

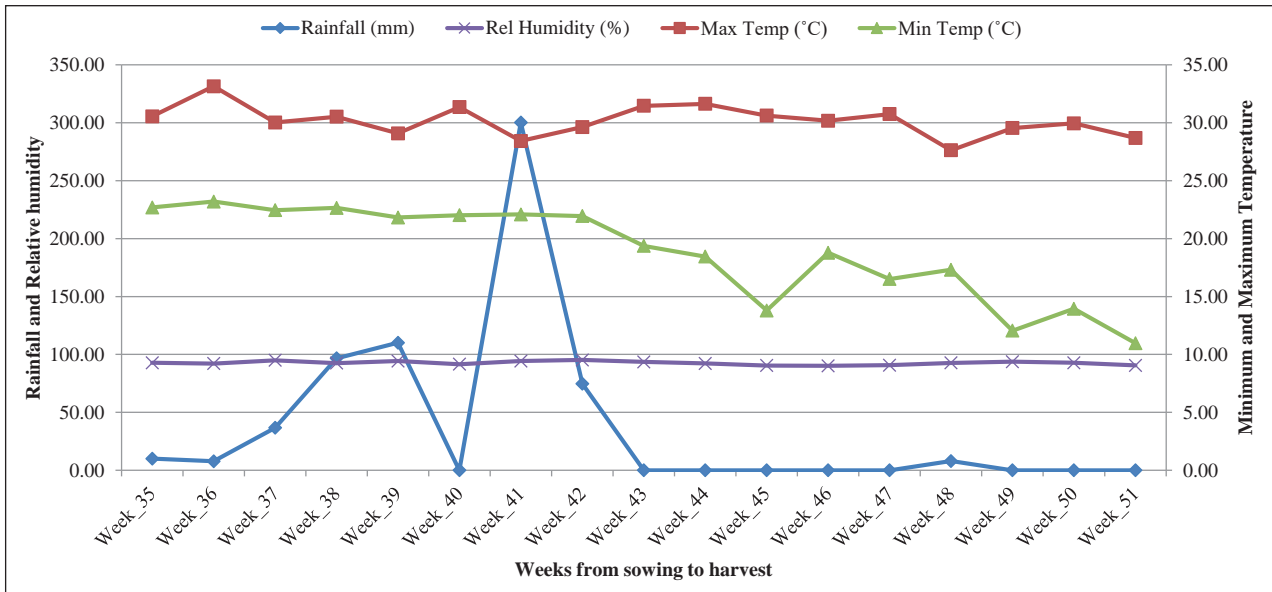


Figure 2. Weekly distribution of rainfall (mm), maximum and minimum temperature (°C) and relative humidity (%) during 2020 rainy season, ICRISAT, Patancheru.

Data collection and analysis

The observations on six quantitative traits were taken on 10 random plants in each plot for panicle length (cm), panicle diameter (cm), number of productive tillers, plant height (cm) and 1000-grain weight (g). Days 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 11 other qualitative or quasi-qualitative traits. These included panicle exertion, panicle tip sterility, plant node pigmentation, internode pigmentation, anther color and presence/absence of bristles in panicle, 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 122 designated restorer lines shows the utilization of a wide range of germplasm and improved lines in developing these R-lines. For instance, 67 R-lines were selected directly from trait or adoption specific composites and 2 R-lines were directly selected from the germplasm accessions (Table 1). In addition, 6 R-lines were derived from crosses that involved germplasm in their parentage and 7 lines had composites in their parentage. Thus, there were 82 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 44 R-lines were derived from crosses between elite inbred lines. Furthermore, while these 122 restorer lines have been developed utilizing diverse parents, they also share a large number of parental lines of common origin. For instance, 28 restorer lines had one of the parents developed from medium composite group (mentioned with the acronym 'MC' in the pedigree). A set of 20 restorer lines had one of the parents from Mandor restorer composite developed from 'Mandor' (Rajasthan State of India) location (acronym used in pedigree with 'MRC') and similarly a set of 20 restorer lines had AIMP as one of the common parent in pedigree i.e. selection derived from Aurangabad-ICRISAT Millet populations. Two different sets of restorer lines with 17 each were developed wherein, one set had HHVBC (High Head Volume B-Composite) and another set had SDM V (SADCC (Southern African Development Coordination Conference (SADCC) Millet Variety) as one of the common parent in pedigree. Similarly, 13 restorer lines developed had a parent developed by selection from Jawahar Bajra Variety (JBV) as one of the common parent. Seven of the other restorers developed had one common parent derived from the selection from Rajasthan composite bajra (represented with acronym 'RCB') and 6 restorers had 'SRC' (Smut resistant composite) as one of the common parent in their pedigree.

Table 1. Genetic base of 122 designated restorer parents (R-lines) of pearl millet at ICRISAT during 2005-2019.

Germplasm base	No of R-lines	Remarks	Genetic base (Code ¹)
Germplasm	2	Inbreeding and selection directly from germplasm	1
Composite	66	Includes composites and open pollinated varieties	2
Germplasm* X Elite line	6	Includes early-generation breeding lines derived from germplasm	3
Composite* X Elite line	6	Includes early-generation breeding lines derived from composites	4
Elite line X Elite line	42	Includes crosses between advanced generation lines	5

¹Includes a line directly derived from a germplasm and similarly for composites. ¹Refer to Annexure II.

Restorers of different CMS systems

Amongst these 122 lines, 102, 60 and 11 R-lines were restorers of A₁, A₄ and A₅ CMS (Cytoplasmic Male Sterility) systems, respectively. Some of these lines were found to be restorers for more than one CMS systems like 41 were dual restorers for A₁ and A₄, and two R-lines for both A₁ and A₅ cms systems. Four R-lines were restorers of all three A₁, A₄ and A₅ systems. It is important to mention here that, more than 90 percentage of hybrids released till date globally and in India are based on A₁ CMS system, while 5-10% are based on A₄ and very few on A₅ CMS system (information from private sector seed industry).

Quantitative traits

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 (Table 2). The overall mean of all the R-lines for 6 quantitative characters revealed significant effect of the season on days to 50% flowering (50 days in summer; 51 days in rainy) and for panicle diameter (2.46 in summer; 2.7 in rainy) (Table 3). A wide range was observed for most of the characters based on the mean values over the two seasons (Table 3). Plant height ranged from 100 to 179 cm, wherein 94% of lines were short and only 5% were of medium height. ICMR 06999 was the only line that showed very short plant height (99.86 cm). Days to 50% flowering varied from 45 to 60 days wherein 43% of lines were of medium duration, 35% were late and 13% were very late. On the other hand only 9% of the lines were of early flowering. Panicle length varied from 12.7 to 31.1 cm wherein 53% of lines were of small and 46% were medium in length. Only single restorer line ICMR 10222 exhibited long panicle size (31.05 cm). Panicle diameter varied from 1.4 to 3.8 cm wherein 74% were of medium, 24% lines were thick and only 2% of lines showed thin panicle size. Thousand grain weight varied from 6.0 to 11.9 g wherein 72% of lines were medium, 20% were bold and only 8% were of small grain size.

Table 2. Analysis of variance for six quantitative traits in pearl millet restorer lines evaluated at ICRISAT, Patancheru.

Source of Variation	d.f.	Mean Square					
		PL	PD	NPT	PH	DFF	TGW
Season	1	29.61 NS	11.17 *	0.004 NS	17892 NS	107.92 *	3.752 NS
Replication/Season	2	32.42 NS	0.26 NS	0.07 NS	1929.3	2.95 NS	15.88 NS
Genotype	121	51.56 **	1.08 ***	2.73 ***	710.4 ***	43.46 ***	4.82 ***
Genotype x Season	121	3.93 **	0.1 ***	0.50 ***	248.7 **	20.47 ***	4.95 ***
Error	242	1.54	0.03	0.32	163.8	2.3	2.19

d.f. = Degrees of freedom; PL= Panicle length; PD= Panicle diameter; NPT= Number of productive tillers; PH= Plant Height; DFF= Days to 50% flowering; TGW= 1000- grain weight.

*, **, *** Significant at 0.05, 0.01 and <0.001 levels, respectively

Table 3. Frequency distribution of designated pearl millet restorer lines for agronomic traits evaluated at ICRISAT, Patancheru (2020 summer and rainy season).

Character	No. of R-lines in trait classes										Range
	Trait class	<90	90.1-100	100.1-110	111.1-120	120.1-130	130.1-140	140.1-150	150.1-160	>160	
Plant height (cm)	Trait class	<90	90.1-100	100.1-110	111.1-120	120.1-130	130.1-140	140.1-150	150.1-160	>160	100-179
	No. of lines	-	1	9	15	35	41	15	2	4	
Days to 50% flowering (days)	Trait class	<42	42.1-45	45.1-48	48.1-51	51.1-54	54.1-57	57.1-60	>60	-	45-60
	No. of lines	-	3	28	51	23	12	5	-	-	
Number of productive tillers plant ⁻¹	Trait class	1	1.1-2	2.1-3	3.1-4	4.1-5	5.1-6	>6	-	-	1-5
	No. of lines	-	61	40	18	3	-	-	-	-	
Panicle length (cm)	Trait class	<15	15.1-20	20.1-25	25.1-30	30.1-35	>35	-	-	-	12.7-31.1
	No. of lines	9	50	53	9	1	-	-	-	-	
Panicle diameter (cm)	Trait class	< 2.0	2.0-2.5	2.6-3.0	3.1-3.5	3.6-4.0	-	-	-	-	1.4-3.8
	No. of lines	11	49	33	25	4	-	-	-	-	
1000-grain weight (g)	Trait class	<6	6.1-7	7.1-8	8.1-9	9.1-10	10.1-11	11.1-12	12.1-13	>13	6.0-11.9
	No. of lines	1	3	14	34	46	20	4	-	-	

Qualitative and quasi- qualitative traits

Frequency distribution of the 122 restorer lines for 11 qualitative and quasi-qualitative characters revealed considerable variation for traits like panicle density, panicle tip sterility, panicle shape, plant growth habit, panicle bristle, panicle exertion, panicle anther color, plant node pigmentation, plant inter-node pigmentation, seed color and seed shape (Annexure III). Majority of the lines (90%) were erect in their growth habit whereas most of the restorer lines (80%) were non-bristled. Green was observed as the most dominant color for node (91%) and internode (100%) followed by brown as the next major trait for node color. A majority of the lines had grey colored seeds (82%), followed by grey brown (10%) and deep grey (5%). In seed shape, globular was the (63%) most dominant, followed by obovate (34%), whereas only 2% lines exhibited elliptical seed shape. About 67% of the lines had complete panicle exertion and only 4% of the lines exhibited partial panicle exertion. The rest of the restorer lines exhibited variable panicle exertion. Compact panicles were most common (35%), followed by semi-compact (30%) whereas only 2% lines were loose and about 25% of restorer lines showed within line variation that varied from very loose to very compact panicles. Only 1 restorer line i.e. ICMR 19444 showed very compact panicle consistently across two seasons.

Within-line variability was observed in few restorer lines across two environments for most of the quasi-qualitative characters like anther color, panicle exertion, panicle density and plant growth habit. Forty one R-lines had alternate phenotypes other than the predominant class for panicle density across both the seasons or in a single season. For instance, ICMR 07333 had loose panicles but had few semi-compact panicles in both summer and rainy seasons. Another instance wherein, ICMR 08111 had semi-compact panicles in summer whereas it showed compact panicles in rainy. Following the same trend, alternate phenotypes were present in 58 restorer lines for panicle tip sterility. For instance ICMR 17666 in which tip sterility was absent in summer whereas, tip sterility was observed in rainy season. Similar alternate phenotypes were also observed for panicle shape apart from the predominant class in either single or both the seasons. For instance, ICMR 08555 had predominant conical shape along with other types in summer whereas, only candle shape panicles were observed in rainy. The alternate phenotypes were also observed for some of the other traits viz., plant growth habit (9 restorer lines), panicle bristles (7 restorer lines), panicle exertion (20 restorer lines) and panicle node pigmentation (10 restorer lines). This within-line variability seems to be due to the method followed for their maintenance where panicles from 10-15 plants are bulked for maintaining 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	Status	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 tiller) Medium (4-6 tiller) High (>6 tiller)	1 3 5 7	Dough (65)	MS
4	Plant: Height	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)	MS
8	Plant: Inter node pigmentation (between 3 rd & 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
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: Days of panicle emergence (50% plants with at least one panicle emerged fully)	Very early (<43days) 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 (< 11cm) 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: Diameter 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

S. No.	Characters	Status	Node ²	Stage of Observation ³	Type of Assessment ⁴
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
19	Panicle: Shape	Cylindrical Conical Spindle Candle Lanceolate Dumble 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
26	Seed: Weight of 1000 grains	Very low (<5.0 gm) Small (5.0-7.5 gm) Medium (7.6-10.0 gm) Bold (10.1- 2.5 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 (2006). Published by AICPMIP (ICAR), ARS, Mandor, Jodhpur - 342304.

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

³Figures in parenthesis indicate the code for growth stages:

3: Seedling emergence stage

45: Panicle emergence stage

50: Anthesis stage

65: Dough stage

75: Harvest maturity stage

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. Pedigree details of 122 new ICRISAT-bred designated pearl millet Restorers (R-lines) developed during 2006 to 2019 at ICRISAT, Patancheru, India

S. NO.	Designation	Pedigree	Restoration on Cytoplasm	Genetic base (Code ¹)
1	ICMR 06111	MC 94 C2-S1-3-1-3-3-2-2-B	A ₁ , A ₄	2
2	ICMR 06222	SDMV 90031-S1-3-3-2-1-3-2-2-1-B	A ₄	2
3	ICMR 06333	SDMV 90031-S1-93-3-1-1-3-2-2-1-1-B	A ₁ , A ₄	2
4	ICMR 06555	AIMP 92901 S1-296-2-1-1-3-B-1-B-B	A ₁	2
5	ICMR 06666	MRC HS-91-2-3-3-B-B-B-B	A ₁	2
6	ICMR 06777	MC 94 C2-S1-47-1-1-3-B-1-B-B	A ₁	2
7	ICMR 06888	MRC HS-219-2-1-2-B-B-B-B	A ₁	2
8	ICMR 06999	MRC S1-4-1-3-B-B-B-B	A ₁	2
9	ICMR 07111	MRC HS-41-2-2-3-B-B-P1-B-B-B	A ₁	2
10	ICMR 07222	MRC HS-130-6-1-1-B-B-B-B-B	A4	2
11	ICMR 07333	JBV 3 S1-95-3-1-2-B	A ₁ , A ₄	2
12	ICMR 07444	ICMV 91059 S1-20-1-2-1-4-1-B-B	A ₁	2
13	ICMR 07555	ICMS 8511 S1-17-2-1-1-4-1-B-3-2-2-B	A ₁ , A ₄	2
14	ICMR 07666	ICMS 7704-S1-126-5-2-1-3-2-2-2-B-3	A ₁	2
15	ICMR 07777	Jakhana × ESRC II S2-81-3-2-2-2	A ₁	3
16	ICMR 07888	(RCB-2-S1-138-1-3 × MRC)-B-2-1-2-B	A ₁	4
17	ICMR 07999	(ICMV-IS 94206-7 × (SRC II C3 S1-1-1-2 × HHVBC)-1-3-3))-B-10-1-2-2	A ₁	5
18	ICMR 08111	(ICMS 7704-S1-127-5-1 × RCB-2 Tall)-B-19-3-4-5-3	A ₁	4
19	ICMR 08222	ICMR 312 S1-8-1-1-1-1-B-B-B-1-B	A ₁	2
20	ICMR 08333	RCB-2 S1-19-2-2-1-2-3-2-1-B-B-B	A ₁	2
21	ICMR 08444	[(((ICMV-IS 94206-15) × B-Lines)-B-6) × (MRC S1-156-2-1-B))-B-13-1-3-3-2-B	A ₁	5
22	ICMR 08555	ICMV 91059 S1-4-2-3-2-1-1-4-B-1-5-B-B	A ₁	2
23	ICMR 08666	HHVBC tall (C1) S1-33-3-1-1-1-2-B-B-3-2	A4	2
24	ICMR 08777	[((MC 94 S1-34-1-B × HHVBC)-16-2-1) × (IP 19626-4-2-3))-B-18-2-2-4-1-B	A ₁ , A ₄	5
25	ICMR 08888	ICMS 7704-S1-52-3-1-2-1-2-1-6-B-B	A ₁ , A ₄	2
26	ICMR 08999	JBV 3 S1-18-2-2-1-3-2	A ₁ , A ₄	2
27	ICMR 09111	JBV 3 S1-6-1-2-1-2-3-B	A ₁ , A ₄	2
28	ICMR 09222	ICMS 7704-S1-127-5-1-5-1-1-3-3-2-B-B	A ₁	2
29	ICMR 09333	MRC HS-225-3-5-2-B-B-B-B-B	A ₁	2
30	ICMR 09444	[(((ICMV-IS 94206-15) × B-Lines)-B-6) × (MRC S1-156-2-1-B))-B-38-3-1-B-7-B	A ₁	5
31	ICMR 09555	ICMS 7704-S1-80-2-1-1-2-2-1-B-B-B-B	A ₁	2
32	ICMR 09666	[(((IP 12322-1-2) × B-Lines)-B-14) × (MRC S1-156-2-1-B))-B-1-3-3-B-B	A4	5
33	ICMR 09777	JBV 3 S1-35-2-1-2-B	A ₁ , A ₄	2

S. NO.	Designation	Pedigree	Restoration on Cytoplasm	Genetic base (Code ¹)
34	ICMR 09888	[((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-34-1-3-3-1-1-B-2	A ₄	5
35	ICMR 09999	JBV 3 S1-257-1-4-1-B	A ₄	2
36	ICMR 10111	AIMP 92901 S1-480-1-1-2-3-1	A ₁	2
37	ICMR 10222	((ICMV IS 94206 S1-15-2) x {(SRC II C3 S1-19-3-2 x HHVBC)-5-3-1})-B-13-4-2-1-1-1-1-3-2	A ₁ , A ₄	5
38	ICMR 10333	JBV 3 S1-2-3-2-2-B-2	A ₄	2
39	ICMR 10444	ICMR 312 S1-17-3-2-1-2-3-B-B-B-B-B	A ₁	2
40	ICMR 10555	JBV 3 S1-6-1-2-1-2-2-B-B	A ₁ , A ₄	2
41	ICMR 10666	ICMV 91059 S1-4-2-3-2-1-1-4-B-1-3-B-3	A ₁	2
42	ICMR 10777	ICMR 312 S1-17-3-2-1-2-2-B-1-B	A ₁	2
43	ICMR 10888	ICMV 93074 S1-9-1-1-1-3-B-B-B-B	A ₁ , A ₄	2
44	ICMR 10999	MRC S1-97-3-4-B-B-1-B-B-B	A ₁	2
45	ICMR 11111	AIMP 92901 S1-296-2-1-1-3-B-1-3-B-2	A ₁	2
46	ICMR 11222	ICMR 312 S1-17-3-2-1-2-3-B-B-B-B-B	A ₁	2
47	ICMR 11333	IAC-ISC TCP5 S1-2-1-1-B-1-2-B-4-B	A ₁	2
48	ICMR 11444	JBV 3 S1-18-2-2-2-3-2-3-B	A ₁	2
49	ICMR 11555	SDMV 90031-S1-3-3-2-1-3-2-2-3-1	A ₁ , A ₄	2
50	ICMR 11666	ICMV 91059 S1-4-2-3-2-1-1-4-B-1-3-B-1	A ₁	2
51	ICMR 11777	ICMS 8511 S1-17-2-1-1-4-1-B-3-2-3-2-B	A ₁	2
52	ICMR 11888	[(((IP 12322-1-2) x B-Lines)-B-8) x (MRC HS-170-3-5-2-B)]-B-5-3-2-3-B-B	A ₁	5
53	ICMR 11999	SDMV 90031-S1-86-4-2-1-1-B-2-3-B-B-B	A ₁	2
54	ICMR 12111	(EERC-HS-29)-B-12-4-1-1	A ₁	2
55	ICMR 12222	JBV 3 S1-33-2-1-3-3-B-3-B-1-B	A ₁ , A ₄	2
56	ICMR 12333	(E 298 x LCSN 282-4-1-2)-12-2-1-2-B-B-B-1	A ₄	1
57	ICMR 12444	(ICMS 7704-S1-127-5-1 x RCB-2 Tall)-B-19-3-2-1-1-1-B	A ₄	4
58	ICMR 12555	(MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-28-1-1	A ₁ , A ₄	5
59	ICMR 12666	[(IPC 107 x SDMV 90031-S1-84-1-1-1-1) x AIMP 92901 S1-296-2-1-1-3-B-1]-3-2-2-1-2-B-B	A ₅	5
60	ICMR 12777	[(IPC 1617 x SDMV 90031-S1-84-1-1-1-1) x GB 8735-S1-25-4-4-1-1-3-1-1]-1-1-3-2-1-B-B	A ₅	5

S. NO.	Designation	Pedigree	Restoration on Cytoplasm	Genetic base (Code ¹)
61	ICMR 12888	[(IPC 337 × SDMV 90031-S1-84-1-1-1-1)×ICMS 8511 S1-14-3-1-1-2-B-1]-4-5-2-2-4-B-B	A ₅	5
62	ICMR 12999	LaGrap C2-S1-14-4-3-4-1-B	A ₁	1
63	ICMR 13111	(ICMV-IS 94206-7 × (SRC II C3 S1-1-1-2 × HHVBC)-1-3-3))-B-10-1-1-5-4-1-1	A ₁	5
64	ICMR 13222	Jakhrana × ESRC II S2-11-B-1-2-1-1-B-B	A ₁	3
65	ICMR 13444	(IAC-ISC TCP6 S1-9-1-2-B-4-2-B × AIMP 92901 S1-488-2-1-1-4-B-B)-B-11-3-1-B	A ₄	5
66	ICMR 13555	GB 8735-S1-15-3-1-1-3-4-2-2-1-1-B-B	A ₁ , A ₄	2
67	ICMR 13666	ICMS 8511 S1-17-2-1-1-4-1-B-3-2-3-2-B-1-1-B	A ₁ , A ₄	2
68	ICMR 13777	(MC 94 C2-S1-3-1-3-3-1-2-1 × SDMV 90031 S1-3-3-2-2-2-2)-B-8-2-1	A ₁ , A ₄	5
69	ICMR 13888	(MC 94 C2-S1-3-2-2-2-1-3-B-B × AIMP 92901 S1-488-2-1-1-4-B-B)-B-23-4-4-2	A ₁ , A ₄	5
70	ICMR 13999	MDMRRC S1-329-1	A ₁ , A ₄	2
71	ICMR 14111	ICTP 8202 S1-99-2-1-B	A ₁	2
72	ICMR 14222	(EERC-HS-29)-19-3	A ₁	2
73	ICMR 14333	[(IPC 107 × SDMV 90031-S1-84-1-1-1-1) × AIMP 92901 S1-296-2-1-1-3-B-1]-3-2-2-2-1-B-2	A ₁	5
74	ICMR 14444	JBV 3 S1-18-2-2-2-3-2-3-B	A ₁	2
75	ICMR 14555	SDMV 95045 S1-7-2-4-2-3-2-1-B-B-B-B-8-1-1-B	A ₁	2
76	ICMR 14666	ICMV 91059 S1-4-2-3-2-1-1-4-B-1-3-B-3	A ₅	2
77	ICMR 14777	HHVBC tall (C1) S1-33-3-1-1-1-2-B-B-3-3-2	A ₁ , A ₄	2
78	ICMR 14888	ICMS 8511 S1-17-2-1-1-4-1-B-3-2-3-2-B-1-1-B	A ₁ , A ₄	2
79	ICMR 14999	AIMP 92901 S1-480-1-1-2-3-1	A ₁ , A ₄	2
80	ICMR 15111	JBV 3 S1-33-2-1-3-3-B-3-B	A ₁	2
81	ICMR 15222	JBV 3 S1-286-1-1-3-B-8-1-1-B	A ₁	2
82	ICMR 15333	MRC HS-86-1-1-5-B-B-B-B-B-1-B-B	A ₁	2
83	ICMR 15444	[(IPC 337 × SDMV 90031-S1-84-1-1-1-1) × ICMS 8511 S1-14-3-1-1-2-B-1]-4-5-2-2-3-B-B	A ₄	5
84	ICMR 15555	AIMP 92901 S1-296-2-1-1-4-2-B-12-5-1-3-B	A ₁ , A ₄	2
85	ICMR 15666	[(((IP 12322-1-2) × B-Lines)-B-8) × (MRC S1-155-4-2-B))-B-14-2-2-1-1-B-4	A ₁ , A ₄	5
86	ICMR 15777	MRC S1-9-2-2-B-B-2-B-B-1-B-B	A ₁ , A ₄	2
87	ICMR 15888	(MC 94 C2-S1-3-2-2-2-1-3-B-B × AIMP 92901 S1-488-2-1-1-4-B-B)-B-28-1-1-B	A ₁ , A ₄	5

S. NO.	Designation	Pedigree	Restoration on Cytoplasm	Genetic base (Code ¹)
88	ICMR 15999	[((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-1-1-2-3-2-B-1	A ₁ , A ₅	5
89	ICMR 16111	(ICMS 7704-S1-18-2-2 x RCB Short)-B-7-2-2-3-4-4-1	A ₁	4
90	ICMR 16222	MRC S1-340-1-3-3-2-B-B-1	A ₁	2
91	ICMR 16444	SDMV 95045 S1-7-2-4-2-3-2-1-B-B-B-B-8-1-1	A ₁	2
92	ICMR 16555	{(SRC II C3 S1-19-3-2 x HHVBC)-1-5-1} x {((96111b x 4017-6-1-1)-1-4-4-3) x (IP 19626-4-1-2-1)]-B-6]-B-5-1-1-3	A ₁ , A ₄	5
93	ICMR 16666	[((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-1-1-2-1-2-B	A ₁ , A ₄	5
94	ICMR 16888	(IPC 1268 x ICMV 91059 S1-58-2-2-2-1)-8-1-1	A ₁ , A ₄ , A ₅	3
95	ICMR 16999	(IPC 107 x SDMV 90031-S1-84-1-1-1-1)-1-2-1-2-2-B-B	A ₁ , A ₄ , A ₅	3
96	ICMR 17111	[(((IP 12322-1-2) x B-Lines)-B-8) x (MRC HS-170-3-5-2-B)]-B-5-3-3-1-4-1-1-B	A ₁	5
97	ICMR 17222	Acid tolerant pop S1-7-1-5-2-B	A ₁	2
98	ICMR 17333	[(RCB-2 S1-19-2-5-1-1-2-3-3-B-B-B-B x (MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-8-3-1)]-7	A ₁	5
99	ICMR 17444	[(IPC 107 x SDMV 90031-S1-84-1-1-1-1) x AIMP 92901 S1-296-2-1-1-3-B-1]-3-2-2-2-1-B-5	A ₅	5
100	ICMR 17555	(IPC 1617 x SDMV 90031-S1-84-1-1-1-1)-26-2-3-1	A ₁ , A ₄	3
101	ICMR 17666	(RCB-2-S1-138-1-3 x MRC-B-2-2-1-B-4-B-1-B-B	A ₁ , A ₄	5
102	ICMR 17777	HiTiP S1-7-3-1-2-1-B-B	A ₁ , A ₄	2
103	ICMR 17888	[(((ICMV-IS 94206-15) x B-Lines)-B-6) x (MRC S1-405-1-2-B)]-B-4-1-1-2-B-5-B	A ₁ , A ₄	5
104	ICMR 17999	[(MC 94 C2-S1-3-1-1-2-3-2-B-1-B-B-B x R-lines bulk 20216-20249/K09)]-12-3	A ₁ , A ₄	5
105	ICMR 18111	ICMV 96490-S1-15-4-1-2-1-B-B	A ₁	2
106	ICMR 18222	{((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-18-2-3-2-2-B x AIMP 92901 S1-296-2-1-1-3-B-1-6-B-B}-B-14-4-3-1-B-B	A ₁	5
107	ICMR 18333	[(IPC 337 x SDMV 90031-S1-84-1-1-1-1) x ICMS 8511 S1-14-3-1-1-2-B-1]-4-5-2-2-3-B-B-B	A ₄	5
108	ICMR 18444	[IP 12370-1-3 x B-Lines]-B-14-3-2-1-1-B-B	A ₄	5

S. NO.	Designation	Pedigree	Restoration on Cytoplasm	Genetic base (Code ¹)
109	ICMR 18555	[JBV 3 S1-300-1-1-2-2 x JBV 3 S1-18-1-3-3-2]-B-7-4 x [((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-4-1-3-3-1-2-1-1-1-3	A ₄	5
110	ICMR 18666	AIMP 92901 S1-296-2-1-1-4-2-B-12-5-1-3-B-B	A ₁ , A ₄	2
111	ICMR 18777	((MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-8-3-1-2-B-B x R-lines bulk (22720-22726/S11))-7-6-2-2-B	A ₁ , A ₄	5
112	ICMR 18888	[((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-18-2-2-4-1-B-B	A ₁ , A ₄	5
113	ICMR 18999	{(((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3))-B-18-2-3-2-2-B x AIMP 92901 S1-296-2-1-1-2-2}-B-7-1-B	A ₁ , A ₄ , A ₅	5
114	ICMR 19111	((MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-23-4-4-2-B-BxR-lines bulk (22720-22726/S11))-8-5-1-5-B	A ₁	5
115	ICMR 19222	(IPC 1617 x SDMV 90031-S1-84-1-1-1-1)-66-1-2-B-B-B	A ₁ , A ₄ , A ₅	3
116	ICMR 19333	((MC 94 C2-S1-3-2-2-2-1-3-B-B x ICMR 312 S1-3-2-3-2-1-1-B-B)-B-22-2-3-3-B-BxR-lines bulk (22680-22692/S11))-2-2-1-4-B	A ₁ , A ₄	5
117	ICMR 19444	((MC 94 C2-S1-3-2-2-2-1-3-B-B x ICMR 312 S1-3-2-3-2-1-1-B-B)-B-22-2-3-3-B-BxR-lines bulk (22680-22692/S11))-2-4-3-1-B-B	A ₁ , A ₄	5
118	ICMR 19555	(MC 94 C2-S1-3-1-1-2-3-2-B-1-B-B-Bx (20216-20249))-4-1-1-2-4	A ₁ , A ₄	4
119	ICMR 19666	{(((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3))-B-18-2-3-2-2-BxAIMP 92901 S1-296-2-1-1-3-B-1-6-B-B}-B-11-2 x (B 282 x S10B-38)-2-1-5-1-1)-2-5-2	A ₁ , A ₄	5
120	ICMR 19777	{(((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3))-B-1-1-2-3-2-B-1 x IP No. 17843-1-1)}}-21-2-3-7-B-B	A ₄	5
121	ICMR 19888	((MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-8-3-1-2-B-Bx (22720-22726/S11))-8-5-3-5	A ₁ , A ₄	5
122	ICMR 19999	(MC 94 C2-S1-3-2-2-2-1-3-B-B x ICMR 312 S1-3-2-3-2-1-1-B-B)-B-34-4-2-B-Bx (22669-22675/S11)-5-1-1-3-B	A ₁ , A ₄	4

Annexure III. Morphological characteristics of pearl millet Restorer lines evaluated during Summer-2020 (E₁) and Rainy- 2020 (E₂) at ICRISAT, Patancheru, India.

Sr. No	Entry name	Panicle Length (cm)				Panicle Diameter (cm)				Number of Productive Tillers			
		E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*
1	ICMR 06111	23.4	22.8	23.1	5	2.4	3.0	2.7	5	1.5	1.7	1.6	3
2	ICMR 06222	21.0	21.7	21.4	5	2.2	2.8	2.5	5	2.2	2.6	2.4	3
3	ICMR 06333	28.2	25.7	27.0	5	2.0	2.4	2.2	5	1.2	1.9	1.6	3
4	ICMR 06555	15.8	17.2	16.5	3	2.6	3.2	2.9	5	1.1	1.6	1.4	1
5	ICMR 06666	11.7	13.7	12.7	3	2.1	2.9	2.5	5	2.7	2.8	2.8	3
6	ICMR 06777	19.3	22.2	20.8	5	2.3	3.0	2.6	5	2.0	1.8	1.9	3
7	ICMR 06888	14.4	14.0	14.2	3	1.4	1.7	1.5	3	3.8	2.7	3.3	3
8	ICMR 06999	14.4	14.6	14.5	3	1.3	1.8	1.6	5	5.1	4.7	4.9	5
9	ICMR 07111	22.5	22.0	22.3	5	2.3	2.8	2.5	5	1.9	2.0	2.0	3
10	ICMR 07222	18.0	18.1	18.1	3	1.3	2.0	1.7	5	3.2	3.1	3.2	3
11	ICMR 07333	18.2	19.8	19.0	3	1.2	2.0	1.6	5	3.1	2.9	3.0	3
12	ICMR 07444	19.4	23.4	21.4	5	1.5	2.1	1.8	5	2.4	3.2	2.8	3
13	ICMR 07555	16.9	18.2	17.6	3	2.1	2.4	2.3	5	2.8	2.6	2.7	3
14	ICMR 07666	15.6	15.5	15.6	3	2.4	2.5	2.4	5	2.5	4.4	3.5	3
15	ICMR 07777	26.0	26.4	26.4	5	2.8	2.8	2.8	5	2.0	1.8	1.8	3
16	ICMR 07888	16.6	14.0	15.3	3	2.1	2.1	2.1	5	2.7	2.6	2.7	3
17	ICMR 07999	17.3	17.5	17.4	3	2.1	2.5	2.3	5	2.6	3.4	3.0	3
18	ICMR 08111	16.2	15.4	15.8	3	2.1	2.2	2.2	5	3.2	3.0	3.1	3
19	ICMR 08222	22.7	23.3	23.0	5	3.1	3.5	3.3	7	1.1	2.3	1.7	3
20	ICMR 08333	19.1	19.0	19.1	3	1.7	1.8	1.8	5	3.6	2.9	3.3	3
21	ICMR 08444	22.9	22.2	22.6	5	1.4	1.6	1.5	3	3.7	3.1	3.4	3
22	ICMR 08555	19.9	21.7	20.8	5	2.1	2.3	2.2	5	1.9	2.3	2.1	3
23	ICMR 08666	24.3	23.5	23.9	5	2.8	2.8	2.8	5	1.4	1.0	1.2	1
24	ICMR 08777	22.4	18.9	20.7	5	3.3	3.7	3.5	7	1.8	1.2	1.5	3
25	ICMR 08888	26.9	25.7	26.3	5	1.7	1.9	1.8	5	3.2	3.0	3.1	3
26	ICMR 08999	21.8	22.6	22.2	5	2.2	2.8	2.5	5	1.9	2.1	2.0	3
27	ICMR 09111	26.5	27.8	27.2	5	2.3	2.6	2.4	5	1.9	2.2	2.1	3
28	ICMR 09222	24.8	19.8	22.3	5	2.6	2.7	2.7	5	1.2	1.2	1.2	1
29	ICMR 09333	20.0	15.2	17.6	3	2.3	2.3	2.3	5	3.3	3.5	3.4	3
30	ICMR 09444	17.2	16.6	16.9	3	1.9	2.3	2.1	5	3.2	3.5	3.4	3
31	ICMR 09555	22.0	20.1	21.1	5	1.5	1.7	1.6	5	3.5	4.2	3.9	5
32	ICMR 09666	23.3	21.7	22.5	5	2.1	2.4	2.3	5	2.3	2.4	2.4	3
33	ICMR 09777	21.4	21.2	21.3	5	2.0	2.3	2.2	5	1.7	1.9	1.8	3
34	ICMR 09888	23.1	21.6	22.4	5	2.8	3.2	3.0	5	1.5	1.5	1.5	3
35	ICMR 09999	24.3	26.3	25.3	5	2.2	2.4	2.3	5	1.7	2.8	2.3	3
36	ICMR 10111	19.0	19.1	19.1	3	3.0	3.0	3.0	5	2.0	1.6	1.6	3
37	ICMR 10222	29.2	32.9	31.1	7	2.2	2.7	2.4	5	1.7	1.1	1.4	1
38	ICMR 10333	19.1	15.4	17.3	3	2.3	2.4	2.4	5	2.6	2.2	2.4	3
39	ICMR 10444	17.8	21.9	19.9	3	1.8	2.3	2.0	5	2.9	3.0	3.0	3

Sr. No	Entry name	Panicle Length (cm)				Panicle Diameter (cm)				Number of Productive Tillers			
		E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*
40	ICMR 10555	21.9	23.1	22.5	5	2.3	2.5	2.4	5	2.2	2.4	2.3	3
41	ICMR 10666	17.5	18.5	18.0	3	2.6	2.7	2.7	5	1.9	1.8	1.9	3
42	ICMR 10777	15.3	15.2	15.3	3	3.4	3.7	3.5	7	1.6	1.9	1.8	3
43	ICMR 10888	18.0	19.3	18.7	3	2.1	2.7	2.4	5	2.4	3.2	2.8	3
44	ICMR 10999	17.7	16.6	17.2	3	1.8	2.1	1.9	5	4.2	3.2	3.7	5
45	ICMR 11111	21.1	19.5	20.3	3	2.6	3.0	2.8	5	1.7	1.1	1.4	1
46	ICMR 11222	15.7	14.1	14.9	3	3.6	3.8	3.7	7	1.7	1.7	1.7	3
47	ICMR 11333	18.3	18.6	18.5	3	2.5	2.9	2.7	5	1.9	1.5	1.7	3
48	ICMR 11444	23.7	21.0	22.4	5	2.3	1.9	2.1	5	2.8	1.2	2.0	3
49	ICMR 11555	20.9	22.5	21.7	5	2.7	2.9	2.8	5	1.6	2.3	2.0	3
50	ICMR 11666	18.6	16.9	17.8	3	2.7	2.6	2.6	5	1.5	1.9	1.7	3
51	ICMR 11777	18.2	18.9	18.6	3	2.0	2.2	2.1	5	3.3	2.3	2.8	3
52	ICMR 11888	15.4	15.6	15.5	3	2.3	2.5	2.4	5	3.6	3.1	3.4	3
53	ICMR 11999	24.6	21.5	23.1	5	2.2	2.4	2.3	5	3.4	2.0	2.7	3
54	ICMR 12111	21.7	18.7	20.2	3	2.2	2.4	2.3	5	2.9	2.7	2.8	3
55	ICMR 12222	21.0	22.7	21.9	5	2.1	2.1	2.1	5	2.4	1.9	2.2	3
56	ICMR 12333	13.2	13.3	13.3	3	1.5	1.3	1.4	3	4.2	4.7	4.5	5
57	ICMR 12444	18.2	17.4	17.8	3	2.3	2.6	2.5	5	3.3	2.7	3.0	3
58	ICMR 12555	19.0	16.2	17.6	3	2.5	2.6	2.6	5	2.4	3.0	2.7	3
59	ICMR 12666	18.9	17.3	18.1	3	2.4	2.3	2.3	5	2.3	1.0	1.7	3
60	ICMR 12777	24.2	24.7	24.5	5	2.5	2.5	2.5	5	1.7	0.5	1.1	1
61	ICMR 12888	19.9	19.6	19.8	3	2.6	2.9	2.8	5	1.6	1.0	1.3	1
62	ICMR 12999	16.7	16.4	16.6	3	3.6	4.0	3.8	7	1.2	1.2	1.2	1
63	ICMR 13111	22.9	16.6	19.8	3	2.2	2.1	2.1	5	1.9	2.1	2.0	3
64	ICMR 13222	16.8	21.5	19.2	3	2.4	1.9	2.2	5	1.6	3.4	2.5	3
65	ICMR 13444	19.0	18.9	19.0	3	2.2	2.7	2.4	5	2.4	2.5	2.5	3
66	ICMR 13555	23.1	20.3	21.7	5	2.3	3.2	2.8	5	2.4	2.4	2.4	3
67	ICMR 13666	12.5	16.5	14.5	3	2.2	2.7	2.4	5	3.9	4.1	4.0	5
68	ICMR 13777	17.4	16.8	17.1	3	2.9	3.0	3.0	5	1.1	2.9	2.0	3
69	ICMR 13888	23.0	21.3	22.2	5	2.7	3.0	2.9	5	1.1	1.4	1.3	1
70	ICMR 13999	20.1	23.6	21.9	5	2.7	3.5	3.1	7	1.0	1.4	1.2	1
71	ICMR 14111	14.2	16.0	15.1	3	2.2	2.6	2.4	5	3.6	2.6	3.1	3
72	ICMR 14222	27.8	27.2	27.5	5	2.7	3.2	3.0	5	1.0	2.0	1.5	3
73	ICMR 14333	17.4	14.8	16.1	3	2.9	3.2	3.1	7	1.5	1.7	1.6	3
74	ICMR 14444	23.3	26.5	24.9	5	2.5	2.7	2.6	5	1.6	2.2	1.9	3
75	ICMR 14555	21.0	17.8	19.4	3	3.1	3.1	3.1	7	2.3	1.1	1.7	3
76	ICMR 14666	19.9	22.6	21.2	5	2.0	2.3	2.2	5	2.5	3.0	2.8	3
77	ICMR 14777	18.8	18.9	18.9	3	2.2	2.5	2.3	5	3.5	1.9	2.7	3
78	ICMR 14888	15.3	15.3	15.3	3	2.2	2.8	2.5	5	4.2	3.5	3.9	5
79	ICMR 14999	21.3	20.1	20.7	5	2.9	3.1	3.0	5	1.8	1.5	1.7	3
80	ICMR 15111	13.9	11.7	12.8	3	1.8	2.1	2.0	5	3.9	3.5	3.7	5

Sr. No	Entry name	Panicle Length (cm)				Panicle Diameter (cm)				Number of Productive Tillers			
		E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*
81	ICMR 15222	16.8	14.0	15.4	3	2.6	2.6	2.6	5	3.0	2.8	2.9	3
82	ICMR 15333	12.8	13.3	13.1	3	1.9	2.2	2.0	5	4.0	3.6	3.8	5
83	ICMR 15444	20.0	19.1	19.6	3	2.5	2.8	2.7	5	3.0	2.1	2.6	3
84	ICMR 15555	17.6	16.5	17.1	3	3.0	3.7	3.4	7	1.6	1.8	1.7	3
85	ICMR 15666	24.5	23.2	23.9	5	3.3	3.5	3.4	7	1.3	1.1	1.2	1
86	ICMR 15777	21.2	20.5	20.9	5	2.8	2.9	2.8	5	2.4	2.6	2.5	3
87	ICMR 15888	24.1	23.4	23.8	5	3.0	3.1	3.1	7	1.2	1.2	1.2	1
88	ICMR 15999	23.8	24.4	24.1	5	3.0	3.2	3.1	7	1.2	1.4	1.3	1
89	ICMR 16111	17.7	17.7	17.7	3	2.0	2.3	2.2	5	3.0	3.0	3.0	3
90	ICMR 16222	17.0	17.0	17.0	3	2.5	2.6	2.5	5	2.3	1.9	2.1	3
91	ICMR 16444	22.2	23.8	23.0	5	2.2	2.6	2.4	5	1.3	3.4	2.4	3
92	ICMR 16555	20.4	19.8	20.1	3	2.9	3.3	3.1	7	1.2	1.6	1.4	1
93	ICMR 16666	23.2	22.3	22.8	5	3.0	3.3	3.1	7	1.7	1.5	1.6	3
94	ICMR 16888	20.8	20.4	20.6	5	2.7	3.1	2.9	5	2.5	2.2	2.4	3
95	ICMR 16999	21.6	21.2	21.4	5	2.3	2.4	2.3	5	1.9	3.1	2.5	3
96	ICMR 17111	20.2	22.5	21.4	5	3.0	3.6	3.3	7	1.5	2.0	1.8	3
97	ICMR 17222	24.4	22.8	23.6	5	2.5	3.0	2.7	5	1.6	1.1	1.4	1
98	ICMR 17333	17.7	16.8	17.3	3	2.9	3.0	2.9	5	1.7	3.4	2.6	3
99	ICMR 17444	18.3	17.5	17.9	3	2.3	2.6	2.4	5	2.6	1.3	2.0	3
100	ICMR 17555	22.0	22.9	22.5	5	2.6	2.9	2.7	5	1.3	1.9	1.6	3
101	ICMR 17666	23.8	23.1	23.5	5	2.5	2.5	2.5	5	2.9	2.8	2.9	3
102	ICMR 17777	20.4	21.4	20.9	5	3.1	3.1	3.1	7	1.3	1.4	1.4	1
103	ICMR 17888	22.1	16.6	19.4	3	2.0	2.9	2.5	5	3.2	2.2	2.7	3
104	ICMR 17999	21.8	22.4	22.1	5	3.4	3.9	3.6	7	1.5	1.2	1.4	1
105	ICMR 18111	14.1	12.1	13.1	3	2.0	2.2	2.1	5	4.9	3.7	4.3	5
106	ICMR 18222	17.2	14.1	15.7	3	3.2	3.6	3.4	7	1.9	1.7	1.8	3
107	ICMR 18333	21.1	18.1	19.6	3	2.5	2.6	2.6	5	2.4	1.8	2.1	3
108	ICMR 18444	23.5	21.6	22.6	5	3.0	3.6	3.3	7	1.7	1.1	1.4	1
109	ICMR 18555	27.9	26.8	27.4	5	2.4	2.7	2.6	5	2.1	2.7	2.4	3
110	ICMR 18666	18.0	16.2	17.1	3	3.0	3.6	3.3	7	1.6	1.2	1.4	1
111	ICMR 18777	26.1	23.0	24.6	5	3.0	3.3	3.2	7	1.2	1.9	1.6	3
112	ICMR 18888	20.1	18.5	19.3	3	3.2	3.6	3.4	7	2.1	1.3	1.7	3
113	ICMR 18999	20.9	19.8	20.4	3	2.6	2.9	2.7	5	2.0	1.6	1.8	3
114	ICMR 19111	22.3	20.9	21.6	5	2.4	2.7	2.6	5	1.9	1.5	1.7	3
115	ICMR 19222	17.6	16.3	17.0	3	3.0	3.2	3.1	7	1.0	1.3	1.2	1
116	ICMR 19333	18.1	16.4	17.3	3	3.3	3.4	3.3	7	2.0	1.7	1.9	3
117	ICMR 19444	21.0	19.9	20.5	3	3.5	3.8	3.7	7	1.9	3.1	2.5	3
118	ICMR 19555	26.1	24.4	25.3	5	3.4	3.7	3.5	7	1.4	1.2	1.3	1
119	ICMR 19666	21.6	21.2	21.4	5	2.9	3.3	3.1	7	1.0	1.5	1.3	1
120	ICMR 19777	24.4	23.1	23.8	5	2.4	3.0	2.7	5	1.4	1.8	1.6	3
121	ICMR 19888	26.5	24.5	25.5	5	3.0	3.3	3.2	7	1.1	1.4	1.3	1
122	ICMR 19999	20.3	20.0	20.2	3	3.0	3.4	3.2	7	1.2	1.1	1.2	1

Annexure III.

Sr. No	Entry name	Plant Height (Excl. Spike) (cm)				Days to 50% flowering (days)				1000-Grain Weight (g)			
		E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*
1	ICMR 06111	123.2	134.0	128.6	3	51	48	49	5	12.2	9.1	10.7	7
2	ICMR 06222	120.5	147.5	134.0	3	50	52	51	7	9.2	8.9	9.1	5
3	ICMR 06333	114.0	118.5	116.3	3	48	49	48	5	9.8	8.7	9.2	5
4	ICMR 06555	106.0	119.5	112.8	3	49	49	49	5	10.3	10.3	10.3	7
5	ICMR 06666	102.3	108.5	105.4	3	49	49	49	5	6.0	9.0	7.5	3
6	ICMR 06777	125.4	137.0	131.2	3	51	51	51	7	8.7	8.3	8.5	5
7	ICMR 06888	104.4	122.0	113.2	3	45	47	46	3	6.8	8.5	7.7	5
8	ICMR 06999	96.7	103.0	99.9	1	49	47	48	5	5.5	10.3	7.9	5
9	ICMR 07111	132.9	152.0	142.5	3	53	57	55	9	8.2	9.5	8.9	5
10	ICMR 07222	98.1	122.0	110.1	3	43	47	45	3	6.4	7.1	6.7	3
11	ICMR 07333	91.3	120.0	105.7	3	44	46	45	3	6.5	8.0	7.2	3
12	ICMR 07444	115.1	149.5	132.3	3	46	48	47	5	7.6	10.2	8.9	5
13	ICMR 07555	125.0	149.5	137.3	3	45	48	46	3	8.8	11.2	10.0	5
14	ICMR 07666	113.0	131.5	122.3	3	50	47	48	5	9.6	9.0	9.3	5
15	ICMR 07777	145.0	145.0	145.0	3	48	48	48	5	9.5	9.5	9.5	5
16	ICMR 07888	98.9	114.0	106.5	3	48	51	49	5	6.8	9.6	8.2	5
17	ICMR 07999	104.2	113.0	108.6	3	48	45	46	3	7.5	11.2	9.4	5
18	ICMR 08111	138.5	144.0	141.3	3	49	53	51	7	7.3	13.2	10.3	7
19	ICMR 08222	139.6	120.5	130.1	3	52	52	52	7	9.5	8.8	9.2	5
20	ICMR 08333	109.7	117.0	113.4	3	44	47	45	3	8.0	11.2	9.6	5
21	ICMR 08444	122.8	133.0	127.9	3	52	55	53	7	5.5	6.6	6.0	3
22	ICMR 08555	129.4	142.0	135.7	3	50	56	53	7	9.2	9.6	9.4	5
23	ICMR 08666	153.1	162.0	157.6	5	56	58	57	9	7.5	9.1	8.3	5
24	ICMR 08777	135.2	145.5	140.4	3	52	59	56	9	8.9	9.9	9.4	5
25	ICMR 08888	144.8	134.0	139.4	3	52	51	51	7	8.8	10.2	9.5	5
26	ICMR 08999	123.7	143.5	133.6	3	46	50	48	5	8.4	8.9	8.7	5
27	ICMR 09111	133.8	142.5	138.2	3	47	51	49	5	9.2	7.6	8.4	5
28	ICMR 09222	128.4	141.0	134.7	3	48	45	47	5	8.5	10.4	9.4	5
29	ICMR 09333	140.0	106.0	123.0	3	47	46	46	3	9.2	9.5	9.3	5
30	ICMR 09444	102.5	116.5	109.5	3	49	51	50	5	6.0	7.5	6.7	3
31	ICMR 09555	132.7	132.0	132.4	3	53	53	53	7	5.6	10.4	8.0	5
32	ICMR 09666	141.1	135.5	138.3	3	58	60	59	9	6.8	11.6	9.2	5
33	ICMR 09777	130.5	151.0	140.8	3	49	70	59	9	7.7	9.5	8.6	5
34	ICMR 09888	145.2	156.0	150.6	5	56	56	56	9	6.0	10.8	8.4	5
35	ICMR 09999	129.0	131.5	130.3	3	54	57	55	9	7.7	10.4	9.0	5
36	ICMR 10111	132.0	131.5	131.5	3	47	47	47	5	8.9	8.9	8.9	5
37	ICMR 10222	142.2	182.0	162.1	5	57	57	57	9	7.7	9.1	8.4	5
38	ICMR 10333	136.8	138.0	137.4	3	51	52	51	9	8.4	6.7	7.6	5
39	ICMR 10444	114.2	138.5	126.4	3	47	53	50	5	7.0	9.5	8.2	5
40	ICMR 10555	110.3	130.0	120.2	3	47	51	49	5	9.5	9.1	9.3	5
41	ICMR 10666	127.2	152.5	139.9	3	46	51	48	5	9.6	9.1	9.4	5

Annexure III.

Sr. No	Entry name	Plant Height (Excl. Spike) (cm)				Days to 50% flowering (days)				1000-Grain Weight (g)			
		E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*
42	ICMR 10777	122.8	144.0	133.4	3	46	47	46	3	9.1	9.1	9.1	5
43	ICMR 10888	128.1	146.0	137.1	3	50	52	51	7	8.9	9.9	9.4	5
44	ICMR 10999	121.9	136.0	129.0	3	53	50	52	7	5.9	9.1	7.5	3
45	ICMR 11111	117.1	151.0	134.1	3	47	51	49	5	11.8	7.9	9.9	5
46	ICMR 11222	111.2	134.5	122.9	3	46	46	46	3	7.9	10.1	9.0	5
47	ICMR 11333	157.0	171.0	164.0	5	49	58	53	7	10.6	11.4	11.0	7
48	ICMR 11444	138.8	112.5	125.7	3	45	57	51	7	11.1	8.9	10.0	5
49	ICMR 11555	124.0	131.0	127.5	3	53	48	51	7	8.9	11.6	10.2	7
50	ICMR 11666	128.9	142.0	135.5	3	49	49	49	5	8.6	10.2	9.4	5
51	ICMR 11777	135.4	156.5	146.0	3	49	51	50	5	7.6	12.1	9.8	5
52	ICMR 11888	121.2	133.5	127.4	3	49	49	49	5	9.3	9.3	9.3	5
53	ICMR 11999	134.4	138.5	136.5	3	56	52	54	7	7.5	7.0	7.3	3
54	ICMR 12111	130.5	140.0	135.3	3	53	48	50	5	8.4	10.0	9.2	5
55	ICMR 12222	128.2	138.8	133.5	3	51	53	52	7	7.8	10.2	9.0	5
56	ICMR 12333	99.4	103.0	101.2	3	45	49	47	5	7.2	10.1	8.7	5
57	ICMR 12444	133.4	155.0	144.2	3	48	52	50	5	8.7	9.0	8.8	5
58	ICMR 12555	115.7	118.0	116.9	3	46	44	45	3	8.5	13.0	10.7	7
59	ICMR 12666	120.1	137.0	128.6	3	45	63	54	7	8.8	9.3	9.1	5
60	ICMR 12777	116.2	112.5	114.4	3	49	51	50	5	11.5	5.9	8.7	5
61	ICMR 12888	112.7	123.0	117.9	3	51	52	51	7	10.0	8.6	9.3	5
62	ICMR 12999	129.1	138.5	133.8	3	51	51	51	7	13.6	10.3	11.9	7
63	ICMR 13111	120.9	127.5	124.2	3	48	52	50	5	9.6	9.7	9.6	5
64	ICMR 13222	114.7	158.5	136.6	3	48	47	47	5	9.7	8.5	9.1	5
65	ICMR 13444	133.8	153.0	143.4	3	51	51	51	7	8.3	10.6	9.4	5
66	ICMR 13555	118.1	160.0	139.1	3	50	52	51	7	8.6	10.6	9.6	5
67	ICMR 13666	108.3	133.0	120.7	3	49	46	47	5	9.9	9.2	9.5	5
68	ICMR 13777	125.1	126.0	125.6	3	48	47	47	5	12.1	10.5	11.3	7
69	ICMR 13888	125.1	123.5	124.3	3	52	47	49	5	12.3	8.4	10.3	7
70	ICMR 13999	115.4	129.5	122.5	3	60	52	56	9	9.6	8.4	9.0	5
71	ICMR 14111	106.6	119.5	113.1	3	49	47	48	5	10.2	7.6	8.9	5
72	ICMR 14222	130.3	139.0	134.7	3	55	49	52	7	10.1	7.3	8.7	5
73	ICMR 14333	112.0	107.0	109.5	3	49	49	49	5	11.7	10.4	11.0	7
74	ICMR 14444	120.5	145.5	133.0	3	46	49	47	5	10.1	8.1	9.1	5
75	ICMR 14555	123.9	233.5	178.7	5	51	51	51	7	10.2	8.9	9.6	5
76	ICMR 14666	114.9	138.5	126.7	3	51	53	53	7	8.4	8.4	8.4	5
77	ICMR 14777	133.4	142.5	138.0	3	48	50	49	5	7.8	10.8	9.3	5
78	ICMR 14888	122.7	131.0	126.9	3	47	47	47	5	9.4	9.9	9.7	5
79	ICMR 14999	136.4	133.0	134.7	3	47	48	47	5	13.6	9.7	11.7	7
80	ICMR 15111	120.8	120.0	120.4	3	53	50	51	7	5.8	7.4	6.6	3
81	ICMR 15222	117.8	114.5	116.2	3	51	48	49	5	8.4	6.8	7.6	5
82	ICMR 15333	90.8	121.5	106.2	3	45	50	48	5	7.7	7.8	7.8	5

Annexure III.

Sr. No	Entry name	Plant Height (Excl. Spike) (cm)				Days to 50% flowering (days)				1000-Grain Weight (g)			
		E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*	E ₁	E ₂	Mean	Node*
83	ICMR 15444	114.9	117.5	116.2	3	50	51	50	5	10.5	11.1	10.8	7
84	ICMR 15555	120.1	128.5	124.3	3	51	50	50	5	9.9	9.0	9.4	5
85	ICMR 15666	125.7	146.0	135.9	3	47	59	53	7	11.3	9.6	10.5	7
86	ICMR 15777	124.8	128.0	126.4	3	49	52	51	7	8.9	8.3	8.6	5
87	ICMR 15888	128.9	125.0	127.0	3	54	50	52	7	11.1	9.9	10.5	7
88	ICMR 15999	124.9	122.0	123.5	3	54	50	52	7	11.1	9.7	10.4	7
89	ICMR 16111	130.3	135.0	132.7	3	54	49	51	7	6.8	8.0	7.4	3
90	ICMR 16222	108.9	122.0	115.5	3	50	47	49	5	10.1	10.9	10.5	7
91	ICMR 16444	145.9	177.5	161.7	5	49	49	49	5	8.6	6.5	7.6	5
92	ICMR 16555	113.3	137.5	125.4	3	50	56	53	7	8.6	8.7	8.7	5
93	ICMR 16666	113.5	137.5	125.5	3	52	59	55	9	12.1	9.6	10.8	7
94	ICMR 16888	141.7	137.0	139.4	3	50	51	50	5	9.4	10.1	9.7	5
95	ICMR 16999	132.5	148.5	140.5	3	51	51	51	7	6.7	9.7	8.2	5
96	ICMR 17111	123.1	120.5	121.8	3	51	51	51	7	8.9	9.5	9.2	5
97	ICMR 17222	123.6	160.5	142.1	3	55	60	57	9	11.0	11.0	11.0	7
98	ICMR 17333	125.5	124.5	125.0	3	55	47	51	7	8.6	8.9	8.8	5
99	ICMR 17444	136.6	134.0	135.3	3	56	51	53	7	8.1	8.9	8.5	5
100	ICMR 17555	130.7	143.5	137.1	3	56	58	57	9	11.2	8.3	9.7	5
101	ICMR 17666	125.5	133.5	129.5	3	46	48	47	5	8.1	6.6	7.3	3
102	ICMR 17777	138.0	156.0	147.0	3	56	57	56	9	10.7	9.7	10.2	7
103	ICMR 17888	132.9	132.0	132.5	3	46	47	47	5	9.7	9.7	9.7	5
104	ICMR 17999	131.9	127.0	129.5	3	54	48	51	7	13.6	8.6	11.1	7
105	ICMR 18111	103.1	104.0	103.6	3	47	46	46	3	8.4	9.1	8.7	5
106	ICMR 18222	108.0	136.0	122.0	3	48	54	51	7	8.8	8.2	8.5	5
107	ICMR 18333	118.0	116.0	117.0	3	50	51	51	7	9.1	8.6	8.9	5
108	ICMR 18444	134.9	157.0	146.0	3	59	60	60	9	10.3	10.3	10.3	7
109	ICMR 18555	125.2	132.0	128.6	3	54	54	54	7	8.2	8.3	8.2	5
110	ICMR 18666	119.8	131.0	125.4	3	50	49	49	5	8.8	6.3	7.6	5
111	ICMR 18777	133.5	141.5	137.5	3	49	45	47	5	11.3	7.9	9.6	5
112	ICMR 18888	131.7	158.5	145.1	3	54	63	59	9	8.2	9.8	9.0	5
113	ICMR 18999	123.7	118.0	120.9	3	51	53	52	7	9.8	9.3	9.5	5
114	ICMR 19111	139.4	148.5	144.0	3	54	50	52	7	10.7	9.0	9.9	5
115	ICMR 19222	103.4	126.0	114.7	3	49	46	48	5	10.5	8.4	9.4	5
116	ICMR 19333	122.0	135.5	128.8	3	54	55	54	7	10.9	9.3	10.1	7
117	ICMR 19444	134.5	133.0	133.8	3	56	53	54	7	10.8	8.7	9.8	5
118	ICMR 19555	119.8	141.0	130.4	3	50	46	48	5	9.5	10.6	10.1	7
119	ICMR 19666	139.0	137.5	138.3	3	53	47	50	5	12.6	9.0	10.8	7
120	ICMR 19777	127.5	159.0	143.3	3	54	57	55	9	8.5	9.0	8.8	5
121	ICMR 19888	137.8	139.0	138.4	3	52	49	50	5	10.1	8.8	9.5	5
122	ICMR 19999	105.3	121.0	113.2	3	50	50	50	5	9.5	8.0	8.7	5

Annexure III.

Sr. No	Restorer lines	Panicle: Density			Panicle: Tip sterility			Panicle: Shape			Plant: Growth Habit		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
1	ICMR 06111	7	5	5-7	1	9	1-9	2	5	2-5	1	1	1
2	ICMR 06222	5	5	5	1	1	1	4	4	4	1	1	1
3	ICMR 06333	5	9	5-9	1	9	1-9	1	2	1-2	1	1	1
4	ICMR 06555	7	7	7	9	9	9	5	5	5	1	1	1
5	ICMR 06666	3	3	3	9	9	9	5	5	5	1	1	1
6	ICMR 06777	5	3	3-5	1	9	1-9	5	1	1-5	1	1	1
7	ICMR 06888	7	7	7	1	1	1	1	1	1	5	1	1-5
8	ICMR 06999	5	7	5-7	1	9	1-9	2	4	2-4	1	1	1
9	ICMR 07111	5	7	5-7	9	9	9	2	2	2	1	1	1
10	ICMR 07222	5	7	5-7	9	1	1-9	1	1	1	1	1	1
11	ICMR 07333	3 ^a	3 ^a	3-5	1	1	1	1	1	1	1	1	1
12	ICMR 07444	5	7	5-7	1	1	1	2	2	2	1	1	1
13	ICMR 07555	5	5	5	1	1	1	2	2	2	1	1	1
14	ICMR 07666	7	5	5-7	1	9	1-9	1	2	1-2	5	1	1-5
15	ICMR 07777	7	5	5-7	1	9	1-9	1	2	1-2	1	1	1
16	ICMR 07888	5 ^a	5 ^a	3-5	9	9	9	4	4	4	1	1	1
17	ICMR 07999	5	3	3-5	1	9	1-9	4	4	4	1	1	1
18	ICMR 08111	5	7	5-7	1	9	1-9	5	5	5	1	1	1
19	ICMR 08222	5	5	5	9	9	9	5	8	5-8	1	1	1
20	ICMR 08333	5	7	5-7	1	1	1	2	2	2	1	1	1
21	ICMR 08444	7	9	7-9	1	1	1	1	1	1	5	5	5
22	ICMR 08555	5	9	5-9	1	9	1-9	2 ^a	4	2-4	1	1	1
23	ICMR 08666	5	5	5	1	1	1	4	1	1-4	1	1	1
24	ICMR 08777	5	5	5	1	1	1	1	1	1	1	1	1
25	ICMR 08888	7	7	7	9	9	9	4	4	4	1	1	1
26	ICMR 08999	5	5	5	1	9	1-9	4	4	4	1	1	1
27	ICMR 09111	5	7	5-7	1	9	1-9	2	2	2	1	1	1
28	ICMR 09222	7	7	7	9	9	9	4	4	4	1	1	1
29	ICMR 09333	5	3	3-5	9	1	1-9	2	2	2	5	1	1-5
30	ICMR 09444	9	3	3-9	9	1	1-9	2	2	2	1	1	1
31	ICMR 09555	7	7	7	1	9	1-9	4	2	2-4	1	1	1
32	ICMR 09666	7	7	7	1	1	1	4 ^a	4	2-4	1	1	1
33	ICMR 09777	7	7	7	1	1	1	4	4	4	1	5	1-5
34	ICMR 09888	5	9	5-9	1	1	1	5	5	5	1	1	1
35	ICMR 09999	7	5	5-7	9	9	9	1	1	1	1	1	1
36	ICMR 10111	5	5	5	9	9	9	2	2	2	1	1	1
37	ICMR 10222	5	9	5-9	9	9	9	1	4	1-4	1	1	1
38	ICMR 10333	5	5	5	1	9	1-9	4	4	4	1	1	1
39	ICMR 10444	5	7	5-7	1	9	1-9	4	4	4	1	1	1
40	ICMR 10555	7	7	7	1	9	1-9	1	4	1-4	1	1	1
41	ICMR 10666	5 ^a	5 ^a	5-7	1	1	1	5	5	5	1	1	1

Annexure III.

Sr. No	Restorer lines	Panicle: Density			Panicle: Tip sterility			Panicle: Shape			Plant: Growth Habit		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
42	ICMR 10777	5	5	5	9	9	9	5	5	5	1	1	1
43	ICMR 10888	7	7	7	1	9	1-9	4	4	4	1	1	1
44	ICMR 10999	5	7	5-7	1	1	1	2	2	2	5	1	1-5
45	ICMR 11111	5 ^a	5 ^a	5-7	1	1	1	2	2	2	1	1	1
46	ICMR 11222	5	7	5-7	1	1	1	2	1	1-2	1	1	1
47	ICMR 11333	5	9	5-9	9	9	9	5	5	5	1	1	1
48	ICMR 11444	7	5	5-7	1	9	1-9	1	1	1	1	1	1
49	ICMR 11555	5	5	5	9	9	9	1	1	1	1	1	1
50	ICMR 11666	5	5	5	1	1	1	4	4	4	1	1	1
51	ICMR 11777	7	7	7	1	9	1-9	1 ^a	1	1-4	5	1	1-5
52	ICMR 11888	5	7	5-7	1	9	1-9	5	5	5	1	1	1
53	ICMR 11999	5	5	5	9	1	1-9	1	1	1	1	1	1
54	ICMR 12111	7	7	7	1	1	1	1	1	1	1	1	1
55	ICMR 12222	7	7	7	1	1	1	2	1	1-2	1	1	1
56	ICMR 12333	5	5	5	1	9	1-9	2	8	2-8	5	5	5
57	ICMR 12444	5	5	5	9	9	9	5	5	5	1	1	1
58	ICMR 12555	5	5	5	9	1	1-9	5	5	5	1	1	1
59	ICMR 12666	7	7	7	1	1	1	2 ^a	2 ^a	1-2	1	1	1
60	ICMR 12777	7	7	7	9	9	9	4	4	4	1	1	1
61	ICMR 12888	7	7	7	9	9	9	5	5	5	1	1	1
62	ICMR 12999	5	5	5	1	1	1	1	1	1	1	1	1
63	ICMR 13111	5 ^a	5 ^a	5-7	1	1	1	1	1	1	1	1	1
64	ICMR 13222	5	5	5	1	1	1	2	2	2	1	1	1
65	ICMR 13444	5	5	5	1	9	1-9	4	2 ^a	2-4	1	1	1
66	ICMR 13555	7	7	7	1	9	1-9	2	2	2	1	1	1
67	ICMR 13666	5	5	5	9	9	9	4	5	4-5	5	1	1-5
68	ICMR 13777	5	5	5	1	9	1-9	1	1	1	1	1	1
69	ICMR 13888	7	7	7	1	9	1-9	4	4	4	1	1	1
70	ICMR 13999	5	5	5	1	9	1-9	1	1	1	1	1	1
71	ICMR 14111	5	5	5	1	9	1-9	2	5	2-5	1	1	1
72	ICMR 14222	5 ^a	5 ^a	5-7	1	1	1	2 ^a	2 ^a	2-4	1	1	1
73	ICMR 14333	7	7	7	1	9	1-9	1 ^a	1	1-5	1	1	1
74	ICMR 14444	5	5	5	1	1	1	1	1	1	1	1	1
75	ICMR 14555	7	7	7	1	9	1-9	4	4	4	1	1	1
76	ICMR 14666	5	7	5-7	1	1	1	4	5	4-5	1	1	1
77	ICMR 14777	5	5	5	1	1	1	2	2	2	1	1	1
78	ICMR 14888	5	5	5	1	9	1-9	2	2	2	1	1	1
79	ICMR 14999	7	7	7	9	9	9	2	2	2	1	1	1
80	ICMR 15111	7	7	7	9	9	9	1	1	1	1	1	1
81	ICMR 15222	7	7	7	9	9	9	5	5	5	5	1	1-5
82	ICMR 15333	5	5	5	1	1	1	4	4	4	1	1	1

Annexure III.

Sr. No	Restorer lines	Panicle: Density			Panicle: Tip sterility			Panicle: Shape			Plant: Growth Habit		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
83	ICMR 15444	7	7	7	9	9	9	2	2	2	1	1	1
84	ICMR 15555	7	5	5-7	9	9	9	2	2	2	1	1	1
85	ICMR 15666	7	7	7	1	1	1	1 ^a	1	1-4	1	1	1
86	ICMR 15777	5	5	5	9	9	9	5	5	5	1	1	1
87	ICMR 15888	7	7	7	1	9	1-9	4	4	4	1	1	1
88	ICMR 15999	7	7	7	1	9	1-9	5	5	5	1	1	1
89	ICMR 16111	3	3	3	1	9	1-9	2	4	2-4	1	1	1
90	ICMR 16222	5	5	5	1	9	1-9	2	2	2	1	1	1
91	ICMR 16444	7	7	7	1	1	1	1	1	1	1	1	1
92	ICMR 16555	7	7	7	1	9	1-9	4 ^a	4	4-5	1	1	1
93	ICMR 16666	5	7	5-7	1	1	1	4	4	4	1	1	1
94	ICMR 16888	3	3	3	1	9	1-9	1	1	1	1	1	1
95	ICMR 16999	7	9	7-9	1	9	1-9	4 ^a	4	2-4	1	1	1
96	ICMR 17111	9	7	7-9	1	9	1-9	1	4	1-4	1	1	1
97	ICMR 17222	7	7	7	1	9	1-9	1	5	1-5	1	1	1
98	ICMR 17333	5	5	5	1	9	1-9	2	1	1-2	1	1	1
99	ICMR 17444	5	7	5-7	1	9	1-9	5	5	5	1	1	1
100	ICMR 17555	7	7	7	1	9	1-9	5 ^a	5	4-5	1	1	1
101	ICMR 17666	7	7	7	1	9	1-9	4	4	4	1	1	1
102	ICMR 17777	5	5	5	1	9	1-9	2	1	1-2	1	1	1
103	ICMR 17888	7	7	7	9	1	1-9	4	4	4	1	1	1
104	ICMR 17999	7	5	5-7	1	9	1-9	2	2	2	1	1	1
105	ICMR 18111	5	5	5	1	1	1	1	1	1	5	1	1-5
106	ICMR 18222	9	7	7-9	1	1	1	5	5	5	1	1	1
107	ICMR 18333	7	7	7	1	9	1-9	4	4	4	1	1	1
108	ICMR 18444	5	5	5	9	9	9	4	4	4	1	1	1
109	ICMR 18555	5	5	5	9	1	1-9	4	4	4	1	1	1
110	ICMR 18666	5	5	5	9	9	9	2	2	2	1	1	1
111	ICMR 18777	7	7	7	1	9	1-9	4	4	4	1	1	1
112	ICMR 18888	5	5	5	1	1	1	1	1	1	1	1	1
113	ICMR 18999	7	7	7	1	9	1-9	4 ^a	5	4-5	1	1	1
114	ICMR 19111	7	7	7	1	9	1-9	2 ^a	2	2-4	1	1	1
115	ICMR 19222	7	7	7	1	1	1	1 ^a	4	1-4	1	1	1
116	ICMR 19333	7	7	7	1	1	1	5	1	1-5	1	1	1
117	ICMR 19444	9	9	9	1	1	1	5	5	5	1	1	1
118	ICMR 19555	5	5	5	9	9	9	5 ^a	5	1-5	1	1	1
119	ICMR 19666	7	7	7	1	9	1-9	1	1	1	1	1	1
120	ICMR 19777	7	7	7	1	1	1	1	1	1	1	1	1
121	ICMR 19888	7	7	7	1	9	1-9	4 ^a	2	2-4	1	1	1
122	ICMR 19999	7	7	7	1	9	1-9	1 ^a	1	1-5	1	1	1

Annexure III.

Sr. No	Restorer lines	Panicle: Bristle			Panicle: Exertion			Panicle: Anther Colour			Plant Node Pigmentation		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
1	ICMR 06111	1	9	1-9	2	2	2	3	3	3	2	2	2
2	ICMR 06222	1	1	1	1	2	1-2	1	1	1	2	2	2
3	ICMR 06333	1	1	1	2	2	2	2	2	2	2	2	2
4	ICMR 06555	1	1	1	2	1	1-2	2	2	2	2	2	2
5	ICMR 06666	1	1	1	2	2	2	1	1	1	2	2	2
6	ICMR 06777	1	1	1	2	1	1-2	1	1	1	2	2	2
7	ICMR 06888	1	1	1	2	2	2	1	1	1	2	2	2
8	ICMR 06999	9	9	9	2	2	2	1	1	1	2	2	2
9	ICMR 07111	9	9	9	2	2	2	1	1	1	2	2	2
10	ICMR 07222	1	1	1	2	2	2	1	1	1	2	2	2
11	ICMR 07333	1	1	1	2	2	2	3	3	3	2	2	2
12	ICMR 07444	1	1	1	2	2	2	3	3	3	5	2	2-5
13	ICMR 07555	1	1	1	2	2	2	1	1	1	2	2	2
14	ICMR 07666	1	1	1	2	2	2	1	1	1	2	2	2
15	ICMR 07777	1	1	1	2	2	2	NA	NA	NA	5	2	2-5
16	ICMR 07888	1	1	1	2	2	2	1	1	1	2	2	2
17	ICMR 07999	1	1	1	2	2	2	1	1	1	2	2	2
18	ICMR 08111	1	1	1	2	2	2	1	1	1	2	2	2
19	ICMR 08222	1	1	1	2	2	2	1	1	1	2	2	2
20	ICMR 08333	1	9	1-9	2	2	2	2	2	2	2	2	2
21	ICMR 08444	1	1	1	2	2	2	1	1	1	2	2	2
22	ICMR 08555	1	1	1	2	2	2	1	1	1	2	2	2
23	ICMR 08666	1	1	1	2	2	2	1	1	1	2	2	2
24	ICMR 08777	1	1	1	1	2	1-2	3	3	3	2	2	2
25	ICMR 08888	1	1	1	2	2	2	1	1	1	2	2	2
26	ICMR 08999	1	1	1	2	2	2	3	3	3	2	2	2
27	ICMR 09111	1	1	1	2	2	2	1	1	1	2	2	2
28	ICMR 09222	1	1	1	2	2	2	1	1	1	2	2	2
29	ICMR 09333	1	1	1	2	2	2	1	1	1	2	2	2
30	ICMR 09444	1	1	1	2	2	2	1	1	1	2	2	2
31	ICMR 09555	1	1	1	2	2	2	1	1	1	2	2	2
32	ICMR 09666	1	1	1	2	2	2	1	1	1	2	2	2
33	ICMR 09777	1	1	1	2	1	1-2	3	3	3	2	2	2
34	ICMR 09888	1	1	1	2	2	2	1	1	1	2	2	2
35	ICMR 09999	1	1	1	2	2	2	1	1	1	2	2	2
36	ICMR 10111	1	1	1	2	1	1-2	2	2	2	2	2	2
37	ICMR 10222	1	1	1	2	2	2	3	3	3	2	3	2-3
38	ICMR 10333	1	1	1	2	2	2	1	1	1	2	2	2
39	ICMR 10444	1	1	1	2	2	2	2	2	2	2	2	2
40	ICMR 10555	1	1	1	2	2	2	3	3	3	2	2	2
41	ICMR 10666	1	1	1	2	2	2	1	1	1	2	2	2

Annexure III.

Sr. No	Restorer lines	Panicle: Bristle			Panicle: Exertion			Panicle: Anther Colour			Plant Node Pigmentation		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
42	ICMR 10777	1	1	1	2	1	1-2	1	1	1	2	2	2
43	ICMR 10888	1	1	1	2	2	2	1	1	1	2	2	2
44	ICMR 10999	1	1	1	2	2	2	2	2	2	5	5	5
45	ICMR 11111	1	1	1	2	2	2	1	1	1	2	2	2
46	ICMR 11222	1	1	1	2	1	1-2	1	1	1	2	2	2
47	ICMR 11333	1	1	1	2	2	2	1	1	1	2	2	2
48	ICMR 11444	1	9	1-9	2	2	2	1	1	1	2	2	2
49	ICMR 11555	1	1	1	1	1	1	1	1	1	2	2	2
50	ICMR 11666	1	1	1	2	2	2	1	1	1	2	2	2
51	ICMR 11777	1	1	1	2	2	2	1	1	1	5	2	2
52	ICMR 11888	1	1	1	2	2	2	1	1	1	2	2	2
53	ICMR 11999	1	1	1	2	2	2	1	1	1	2	2	2
54	ICMR 12111	1	1	1	2	2	2	2	2	2	2	2	2
55	ICMR 12222	1	1	1	2	2	2	1	1	1	2	2	2
56	ICMR 12333	1	1	1	2	2	2	1	1	1	2	2	2
57	ICMR 12444	1	1	1	2	2	2	1	1	1	2	2	2
58	ICMR 12555	1	1	1	2	2	2	1	1	1	2	2	2
59	ICMR 12666	1	1	1	2	2	2	1	1	1	2	2	2
60	ICMR 12777	1	1	1	2	1	1-2	1	1	1	2	2	2
61	ICMR 12888	1	1	1	2	2	2	1	1	1	2	2	2
62	ICMR 12999	1	1	1	1	1	1	1	1	1	2	2	2
63	ICMR 13111	1	1	1	2	2	2	1	1	1	2	2	2
64	ICMR 13222	1	9	1-9	2	2	2	2	2	2	2	5	2-5
65	ICMR 13444	1	1	1	2	2	2	1	1	1	2	2	2
66	ICMR 13555	1	9	1-9	2	2	2	3	3	3	2	5	2-5
67	ICMR 13666	1	1	1	2	2	2	1	1	1	2	2	2
68	ICMR 13777	1	1	1	2	2	2	1	1	1	2	2	2
69	ICMR 13888	1	1	1	2	2	2	2	2	2	2	2	2
70	ICMR 13999	1	1	1	1	1	1	1	1	1	2	2	2
71	ICMR 14111	1	1	1	2	2	2	1	1	1	2	2	2
72	ICMR 14222	1	1	1	2	2	2	1	1	1	2	2	2
73	ICMR 14333	1	1	1	2	1	1-2	1	1	1	3	2	2-3
74	ICMR 14444	1	1	1	2	2	2	3	3	3	2	2	2
75	ICMR 14555	1	1	1	2	2	2	1	1	1	2	2	2
76	ICMR 14666	1	1	1	2	2	2	3	3	3	5	2	2-5
77	ICMR 14777	1	1	1	2	2	2	1	1	1	2	2	2
78	ICMR 14888	1	1	1	2	2	2	1	1	1	2	2	2
79	ICMR 14999	1	1	1	2	1	1-2	1	1	1	2	2	2
80	ICMR 15111	1	1	1	2	2	2	1	1	1	2	2	2
81	ICMR 15222	1	1	1	2	2	2	1	1	1	2	2	2
82	ICMR 15333	1	1	1	2	2	2	2	2	2	2	2	2

Annexure III.

Sr. No	Restorer lines	Panicle: Bristle			Panicle: Exertion			Panicle: Anther Colour			Plant Node Pigmentation		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
83	ICMR 15444	1	1	1	2	1	1-2	1	1	1	2	2	2
84	ICMR 15555	1	1	1	2	2	2	1	1	1	2	2	2
85	ICMR 15666	1	1	1	2	2	2	2	2	2	2	2	2
86	ICMR 15777	1	1	1	1	1	1	1	1	1	2	2	2
87	ICMR 15888	1	1	1	2	1	1-2	1	1	1	2	2	2
88	ICMR 15999	1	1	1	2	1	1-2	1	1	1	2	2	2
89	ICMR 16111	9	1	1-9	2	2	2	1	1	1	2	2	2
90	ICMR 16222	1	1	1	2	2	2	3	3	3	2	3	2-3
91	ICMR 16444	1	1	1	2	2	2	1	1	1	2	2	2
92	ICMR 16555	1	1	1	2	2	2	1	1	1	2	2	2
93	ICMR 16666	1	1	1	2	2	2	3	3	3	2	2	2
94	ICMR 16888	1	1	1	2	2	2	2	2	2	2	2	2
95	ICMR 16999	9	9	1	2	2	2	1	1	1	2	2	2
96	ICMR 17111	1	1	1	1	1	1	3	3	3	2	2	2
97	ICMR 17222	1	1	1	2	2	2	3	3	3	2	2	2
98	ICMR 17333	1	1	1	2	2	2	1	1	1	2	2	2
99	ICMR 17444	1	1	1	2	2	2	1	1	1	2	2	2
100	ICMR 17555	1	1	1	2	2	2	1	1	1	2	2	2
101	ICMR 17666	1	1	1	2	2	2	1	1	1	2	2	2
102	ICMR 17777	1	1	1	2	2	2	1	1	1	2	2	2
103	ICMR 17888	1	1	1	2	2	2	1	1	1	5	2	2-5
104	ICMR 17999	1	1	1	2	1	1-2	1	1	1	2	2	2
105	ICMR 18111	1	1	1	2	2	2	1	1	1	2	2	2
106	ICMR 18222	1	1	1	2	2	2	3	3	3	2	2	2
107	ICMR 18333	1	1	1	2	1	1-2	1	1	1	2	2	2
108	ICMR 18444	1	1	1	2	2	2	2	2	2	2	2	2
109	ICMR 18555	1	1	1	2	2	2	3	3	3	2	2	2
110	ICMR 18666	1	1	1	1	2	1-2	1	1	1	2	2	2
111	ICMR 18777	1	1	1	2	2	2	1	1	1	2	2	2
112	ICMR 18888	1	1	1	2	2	2	3	3	3	2	2	2
113	ICMR 18999	1	1	1	2	2	2	1	1	1	2	2	2
114	ICMR 19111	1	1	1	2	2	2	1	1	1	2	2	2
115	ICMR 19222	1	1	1	2	1	1-2	1	1	1	2	2	2
116	ICMR 19333	1	1	1	2	2	2	1	1	1	2	2	2
117	ICMR 19444	1	1	1	2	2	2	1	1	1	2	2	2
118	ICMR 19555	1	1	1	2	2	2	2	2	2	2	2	2
119	ICMR 19666	1	9	1-9	2	1	1-2	1	1	1	2	2	2
120	ICMR 19777	1	1	1	2	2	2	2	2	2	2	3	2-3
121	ICMR 19888	1	1	1	2	2	2	1	1	1	2	2	2
122	ICMR 19999	1	1	1	2	1	1-2	1	1	1	2	2	2

Annexure III.

Sr. No	Restorer lines	Plant inter-Node Pigmentation			Seed Colour			Seed Shape		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
1	ICMR 06111	2	2	2	4	4	4	1	1	1
2	ICMR 06222	2	2	2	6	6	6	4	4	4
3	ICMR 06333	2	2	2	4	4	4	1	1	1
4	ICMR 06555	2	2	2	4	4	4	4	4	4
5	ICMR 06666	2	2	2	4	4	4	4	4	4
6	ICMR 06777	2	2	2	4	4	4	4	4	4
7	ICMR 06888	2	2	2	5	5	5	1	1	1
8	ICMR 06999	2	2	2	4	4	4	4	4	4
9	ICMR 07111	2	2	2	6	6	6	4	4	4
10	ICMR 07222	2	2	2	6	6	6	4	4	4
11	ICMR 07333	2	2	2	6	6	6	4	4	4
12	ICMR 07444	2	2	2	6	6	6	2	2	2
13	ICMR 07555	2	2	2	6	6	6	4	4	4
14	ICMR 07666	2	2	2	6	6	6	4	4	4
15	ICMR 07777	2	2	2	4	4	4	4	4	4
16	ICMR 07888	2	2	2	4	4	4	4	4	4
17	ICMR 07999	2	2	2	4	4	4	4	4	4
18	ICMR 08111	2	2	2	4	4	4	4	4	4
19	ICMR 08222	2	2	2	4	4	4	4	4	4
20	ICMR 08333	2	2	2	4	4	4	4	4	4
21	ICMR 08444	2	2	2	4	4	4	4	4	4
22	ICMR 08555	2	2	2	4	4	4	4	4	4
23	ICMR 08666	2	2	2	4	4	4	4	4	4
24	ICMR 08777	2	2	2	4	4	4	4	4	4
25	ICMR 08888	2	2	2	4	4	4	1	1	1
26	ICMR 08999	2	2	2	4	4	4	4	4	4
27	ICMR 09111	2	2	2	4	4	4	4	4	4
28	ICMR 09222	2	2	2	5	5	5	1	1	1
29	ICMR 09333	2	2	2	4	4	4	4	4	4
30	ICMR 09444	2	2	2	4	4	4	4	4	4
31	ICMR 09555	2	2	2	4	4	4	4	4	4
32	ICMR 09666	2	2	2	4	4	4	2	2	2
33	ICMR 09777	2	2	2	4	4	4	1	1	1
34	ICMR 09888	2	2	2	4	4	4	4	4	4
35	ICMR 09999	2	2	2	4	4	4	1	1	1
36	ICMR 10111	2	2	2	5	5	5	4	4	4
37	ICMR 10222	2	2	2	4	4	4	4	4	4
38	ICMR 10333	2	2	2	4	4	4	1	1	1
39	ICMR 10444	2	2	2	4	4	4	4	4	4
40	ICMR 10555	2	2	2	4	4	4	1	1	1
41	ICMR 10666	2	2	2	4	4	4	1	1	1

Annexure III.

Sr. No	Restorer lines	Plant inter-Node Pigmentation			Seed Colour			Seed Shape		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
42	ICMR 10777	2	2	2	4	4	4	4	4	4
43	ICMR 10888	2	2	2	4	4	4	1	1	1
44	ICMR 10999	2	2	2	4	4	4	4	4	4
45	ICMR 11111	2	2	2	4	4	4	4	4	4
46	ICMR 11222	2	2	2	4	4	4	4	4	4
47	ICMR 11333	2	2	2	4	4	4	1	1	1
48	ICMR 11444	2	2	2	4	4	4	4	4	4
49	ICMR 11555	2	2	2	4	4	4	4	4	4
50	ICMR 11666	2	2	2	4	4	4	1	1	1
51	ICMR 11777	2	2	2	4	4	4	4	4	4
52	ICMR 11888	2	2	2	2	2	2	4	4	4
53	ICMR 11999	2	2	2	4	4	4	4	4	4
54	ICMR 12111	2	2	2	4	4	4	1	1	1
55	ICMR 12222	2	2	2	4	4	4	4	4	4
56	ICMR 12333	2	2	2	4	4	4	1	1	1
57	ICMR 12444	2	2	2	4	4	4	4	4	4
58	ICMR 12555	2	2	2	4	4	4	4	4	4
59	ICMR 12666	2	2	2	4	4	4	1	1	1
60	ICMR 12777	2	2	2	2	2	2	1	1	1
61	ICMR 12888	2	2	2	4	4	4	1	1	1
62	ICMR 12999	2	2	2	4	4	4	4	4	4
63	ICMR 13111	2	2	2	4	4	4	4	4	4
64	ICMR 13222	2	2	2	4	4	4	4	4	4
65	ICMR 13444	2	2	2	4	4	4	4	4	4
66	ICMR 13555	2	2	2	4	4	4	4	4	4
67	ICMR 13666	2	2	2	2	2	2	4	4	4
68	ICMR 13777	2	2	2	4	4	4	4	4	4
69	ICMR 13888	2	2	2	4	4	4	4	4	4
70	ICMR 13999	2	2	2	6	6	6	4	4	4
71	ICMR 14111	2	2	2	6	6	6	4	4	4
72	ICMR 14222	2	2	2	4	4	4	1	1	1
73	ICMR 14333	2	2	2	4	4	4	4	4	4
74	ICMR 14444	2	2	2	6	6	6	4	4	4
75	ICMR 14555	2	2	2	4	4	4	1	1	1
76	ICMR 14666	2	2	2	4	4	4	1	1	1
77	ICMR 14777	2	2	2	4	4	4	1	1	1
78	ICMR 14888	2	2	2	4	4	4	4	4	4
79	ICMR 14999	2	2	2	5	5	5	1	1	1
80	ICMR 15111	2	2	2	4	4	4	1	1	1
81	ICMR 15222	2	2	2	4	4	4	4	4	4
82	ICMR 15333	2	2	2	6	6	6	4	4	4

Annexure III.

Sr. No	Restorer lines	Plant inter-Node Pigmentation			Seed Colour			Seed Shape		
		E ₁	E ₂	Mean	E ₁	E ₂	Mean	E ₁	E ₂	Mean
83	ICMR 15444	2	2	2	4	4	4	1	1	1
84	ICMR 15555	2	2	2	4	4	4	1	1	1
85	ICMR 15666	2	2	2	4	4	4	4	4	4
86	ICMR 15777	2	2	2	4	4	4	4	4	4
87	ICMR 15888	2	2	2	4	4	4	1	1	1
88	ICMR 15999	2	2	2	4	4	4	1	1	1
89	ICMR 16111	2	2	2	4	4	4	1	1	1
90	ICMR 16222	2	2	2	4	4	4	4	4	4
91	ICMR 16444	2	2	2	5	5	5	1	1	1
92	ICMR 16555	2	2	2	4	4	4	1	1	1
93	ICMR 16666	2	2	2	4	4	4	4	4	4
94	ICMR 16888	2	2	2	4	4	4	2	2	2
95	ICMR 16999	2	2	2	4	4	4	1	1	1
96	ICMR 17111	2	2	2	6	6	6	1	1	1
97	ICMR 17222	2	2	2	4	4	4	4	4	4
98	ICMR 17333	2	2	2	4	4	4	1	1	1
99	ICMR 17444	2	2	2	4	4	4	1	1	1
100	ICMR 17555	2	2	2	4	4	4	1	1	1
101	ICMR 17666	2	2	2	4	4	4	1	1	1
102	ICMR 17777	2	2	2	7	7	7	1	1	1
103	ICMR 17888	2	2	2	4	4	4	1	1	1
104	ICMR 17999	2	2	2	4	4	4	4	4	4
105	ICMR 18111	2	2	2	4	4	4	4	4	4
106	ICMR 18222	2	2	2	4	4	4	1	1	1
107	ICMR 18333	2	2	2	NA	NA	NA	NA	NA	NA
108	ICMR 18444	2	2	2	4	4	4	4	4	4
109	ICMR 18555	2	2	2	4	4	4	4	4	4
110	ICMR 18666	2	2	2	4	4	4	4	4	4
111	ICMR 18777	2	2	2	4	4	4	4	4	4
112	ICMR 18888	2	2	2	4	4	4	4	4	4
113	ICMR 18999	2	2	2	4	4	4	4	4	4
114	ICMR 19111	2	2	2	4	4	4	1	1	1
115	ICMR 19222	2	2	2	4	4	4	1	1	1
116	ICMR 19333	2	2	2	4	4	4	4	4	4
117	ICMR 19444	2	2	2	4	4	4	4	4	4
118	ICMR 19555	2	2	2	4	4	4	4	4	4
119	ICMR 19666	2	2	2	4	4	4	4	4	4
120	ICMR 19777	2	2	2	4	4	4	4	4	4
121	ICMR 19888	2	2	2	4	4	4	4	4	4
122	ICMR 19999	2	2	2	5	5	5	4	4	4

Key Characteristics of Restorer Parents

Restorer parent

ICMR 06111: MC 94 C2-S1-3-1-3-3-2-2-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (129 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Conical-Lanceolate
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 06222: SDMV 90031-S1-3-3-2-1-3-2-2-1-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (134 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial- Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 06333: SDMV 90031-S1-93-3-1-1-3-2-2-1-1-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (116 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (27 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Semi compact-very compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 06555 : AIMP 92901 S1-296-2-1-1-3-B-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% flowering	Medium (49 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (113 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (2.9 cm)
Panicle shape	Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 06666 : MRC HS-91-2-3-3-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (105 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (13 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Lanceolate
Panicle density	Loose
Seed color	Grey
Seed shape	Globular
1000-grain weight	Small (8 gm)



Restorer parent

ICMR 06777 : MC 94 C2-S1-47-1-1-3-B-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (131 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial- Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Cylindrical-Lanceolate
Panicle density	Loose-semi compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8.5 gm)



Restorer parent

ICMR 06888 : MRC HS-219-2-1-2-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (113 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (14 cm)
Panicle diameter	Thin (1.5 cm)
Panicle shape	Cylindrical
Panicle density	Compact
Seed color	Deep grey
Seed shape	Obovate
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 06999 : MRC S1-4-1-3-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Very short (100 cm)
Number of productive tillers	Medium (5)
Panicle exertion	Complete
Panicle length	Small (15 cm)
Panicle diameter	Medium (1.6 cm)
Panicle shape	Conical-Candle
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 07111 : MRC HS-41-2-2-3-B-B-P1-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (55 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (142 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Conical
Panicle density	Semi compact- Compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 07222 : MRC HS-130-6-1-1-B-B-B-B-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (45 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (110 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (1.7 cm)
Panicle shape	Cylindrical
Panicle density	Semi compact- Compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Small (6.7 gm)



Restorer parent

ICMR 07333 : JBV 3 S1-95-3-1-2-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (45 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (106 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (1.6 cm)
Panicle shape	Cylindrical
Panicle density	Loose-Semi compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Small (7 gm)



Restorer parent

ICMR 07444 : ICMV 91059 S1-20-1-2-1-4-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Purple
Node pigmentation	Green-Purple
Plant height	Short (132 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (1.8 cm)
Panicle shape	Conical
Panicle density	Semi compact-Compact
Seed color	Grey brown
Seed shape	Elliptical
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 07555 : ICMS 8511 S1-17-2-1-1-4-1-B-3-2-2-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (137 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Conical
Panicle density	Semi-Compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 07666 : ICMS 7704-S1-126-5-2-1-3-2-2-2-B-3 (Restoration on A₁)

Key Characteristics

Growth habit	Erect- Intermediate
Days to 50% Flowering	Medium (48 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (122 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (16 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Cylindrical- Conical
Panicle density	Semi compact- Compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 07777 : Jakhrana × ESRC II S2-81-3-2-2-2 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	NA
Node pigmentation	Green-Purple
Plant height	Short (145 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (26 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 07888 : (RCB-2-S1-138-1-3 × MRC)-B-2-1-2-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (106 days)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (15 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Candle
Panicle density	Loose- Semi compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 07999 : (ICMV-IS 94206-7 × (SRC II C3 S1-1-1-2 × HHVBC)-1-3-3))-B-10-1-2-2
(Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (109 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Candle
Panicle density	Loose- Semi compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 08111 : (ICMS 7704-S1-127-5-1 × RCB-2 Tall)-B-19-3-4-5-3 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (141 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (16 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Lanceolate
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 08222 : ICMR 312 S1-8-1-1-1-1-B-B-B-1-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (130 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Thick (3.3 cm)
Panicle shape	Lanceolate-Oblanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 08333 : RCB-2 S1-19-2-2-1-2-3-2-1-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (45 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (113 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (1.8 cm)
Panicle shape	Conical
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 08444 : [(((ICMV-IS 94206-15) × B-Lines)-B-6) × (MRC S1-156-2-1-B)]-B-13-1-3-3-2-B
(Restoration on A₁)

Key Characteristics

Growth habit	Intermediate
Days to 50% Flowering	Late (53 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (128 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Thin (1.5 cm)
Panicle shape	Cylindrical
Panicle density	Compact- Very compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Small (6 gm)

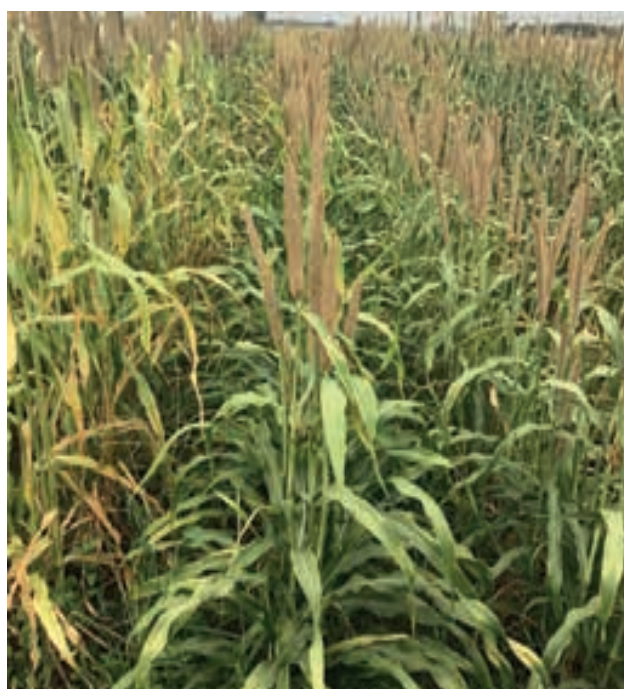


Restorer parent

ICMR 08555 : ICMV 91059 S1-4-2-3-2-1-1-4-B-1-5-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (136 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Conical-Candle
Panicle density	Semi compact- Very compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9.4 gm)



Restorer parent

ICMR 08666 : HHVBC tall (C1) S1-33-3-1-1-1-2-B-B-3-2 (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (57 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (158 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (24 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 08777 : [((MC 94 S1-34-1-B x HHVBC)-16-2-1) × (IP 19626-4-2-3)]-B-18-2-2-4-1-B
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (56 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (140 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial-Complete
Panicle length	Medium (21 cm)
Panicle diameter	Thick (3.5 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 08888 : ICMS 7704-S1-52-3-1-2-1-2-1-6-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (139 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (26 cm)
Panicle diameter	Medium (1.8 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 08999 : JBV 3 S1-18-2-2-1-3-2 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (134 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 09111 : JBV 3 S1-6-1-2-1-2-3-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (138 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (27 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Conical
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 09222 : ICMS 7704-S1-127-5-1-5-1-1-3-3-2-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (135 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Deep grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 09333 : MRC HS-225-3-5-2-B-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (123 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Conical
Panicle density	Loose-Semi compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 09444 : [(((ICMV-IS 94206-15) × B-Lines)-B-6) × (MRC S1-156-2-1-B)]-B-38-3-1-B-7-B
(Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (110 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Conical
Panicle density	Loose-very compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Small (7 gm)



Restorer parent

ICMR 09555 : ICMS 7704-S1-80-2-1-1-2-2-1-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (132 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (1.6 cm)
Panicle shape	Conical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 09666 : [(((IP 12322-1-2) × B-Lines)-B-14) × (MRC S1-156-2-1-B)]-B-1-3-3-B-B
(Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (59 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (138 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Conical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Elliptical
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 09777 : JBV 3 S1-35-2-1-2-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (59 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (141 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial-Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 09888 : [((MC 94 S1-34-1-B x HHVBC)-16-2-1) × (IP 19626-4-2-3)]-B-34-1-3-3-1-1-B-2
(Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (56 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (151 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (3 cm)
Panicle shape	Lanceolate
Panicle density	Semi compact- Very compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8gm)



Restorer parent

ICMR 09999 : JBV 3 S1-257-1-4-1-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (55 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (130 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (25 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Cylindrical
Panicle density	Semi compact-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 10111 : AIMP 92901 S1-480-1-1-2-3-1 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (132 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial-Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (3 cm)
Panicle shape	Conical
Panicle density	Semi-compact
Seed color	Deep grey
Seed shape	Globular
1000-grain weight	Medium (8.9 gm)



Restorer parent

ICMR 10222 : ((ICMV IS 94206 S1-15-2) × {(SRC II C3 S1-19-3-2 x HHVBC)-5-3-1})-B-13-4-2-1-1-1-1-3-2 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (57 days)
Anther color	Purple
Node pigmentation	Green-Brown
Plant height	Medium (162 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Long (31 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Semi compact- Very compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8.4 cm)



Restorer parent

ICMR 10333 : JBV 3 S1-2-3-2-2-B-2 (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (137 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (7.6 gm)



Restorer parent

ICMR 10444 : ICMR 312 S1-17-3-2-1-2-3-B-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (126 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.0 cm)
Panicle shape	Candle
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 10555 : JBV 3 S1-6-1-2-1-2-2-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (120 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 10666 : ICMV 91059 S1-4-2-3-2-1-1-4-B-1-3-B-3 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (140 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Lanceolate
Panicle density	Semi compact – Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 10777 : ICMR 312 S1-17-3-2-1-2-2-B-1-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (133 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial-Complete
Panicle length	Small (15 cm)
Panicle diameter	Thick (3.5 cm)
Panicle shape	Lanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 10888 : ICMV 93074 S1-9-1-1-1-3-B-B-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (137 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 10999 : MRC S1-97-3-4-B-B-1-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Late (52 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (129 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (1.9 cm)
Panicle shape	Conical
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Small (8 gm)



Restorer parent

ICMR 11111 : AIMP 92901 S1-296-2-1-1-3-B-1-3-B-2 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (134 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Conical
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 11222 : ICMR 312 S1-17-3-2-1-2-3-B-B-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (123 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial- Complete
Panicle length	Small (15 cm)
Panicle diameter	Thick (3.7 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Semi-Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 11333 : IAC-ISC TCP5 S1-2-1-1-B-1-2-B-4-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (164 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Lanceolate
Panicle density	Semi compact- Very compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 11444 : JBV 3 S1-18-2-2-2-3-2-3-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (126 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Cylindrical
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 11555 : SDMV 90031-S1-3-3-2-1-3-2-2-3-1 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (128 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 11666 : ICMV 91059 S1-4-2-3-2-1-1-4-B-1-3-B-1 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (135 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 11777 : ICMS 8511 S1-17-2-1-1-4-1-B-3-2-3-2-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (146 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9.8 cm)



Restorer parent

ICMR 11888 : [(((IP 12322-1-2) × B-Lines)-B-8) × (MRC HS-170-3-5-2-B)]-B-5-3-2-3-B-B
(Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (127 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (16 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Lanceolate
Panicle density	Semi compact- Compact
Seed color	Cream
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 11999 : SDMV 90031-S1-86-4-2-1-1-B-2-3-B-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (136.cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Small (7 gm)



Restorer parent

ICMR 12111 : (EERC-HS-29)-B-12-4-1-1 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (135 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Cylindrical
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)

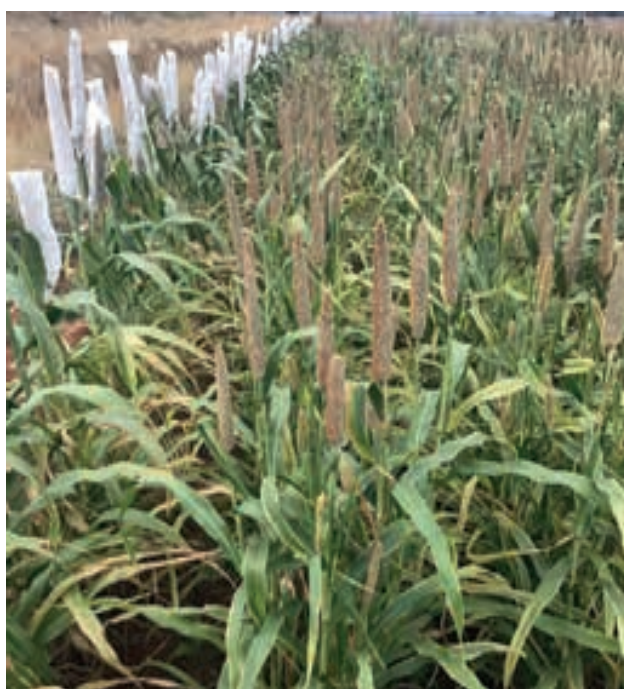


Restorer parent

ICMR 12222 : JBV 3 S1-33-2-1-3-3-B-3-B-1-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (134 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 12333 : (E 298 x LCSN 282-4-1-2)-12-2-1-2-B-B-B-1 (Restoration on A₄)

Key Characteristics

Growth habit	Intermediate
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (101 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (13 cm)
Panicle diameter	Thin (1.4 cm)
Panicle shape	Conical- Oblanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 12444 : (ICMS 7704-S1-127-5-1 × RCB-2 Tall)-B-19-3-2-1-1-1-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (144 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Lanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 12555 : (MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-28-1-1
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Early (45 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (117 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Lanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 12666 : [(IPC 107 × SDMV 90031-S1-84-1-1-1-1) × AIMP 92901 S1-296-2-1-1-3-B-1]-3-2-2-1-2-B-B (Restoration on A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (129 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 12777 : [(IPC 1617 × SDMV 90031-S1-84-1-1-1-1) × GB 8735-S1-25-4-4-1-1-3-1-1]-1-1-3-2-1-B-B (Restoration on A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (114 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial-Complete
Panicle length	Medium (24 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Cream
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 12888 : [(IPC 337 × SDMV 90031-S1-84-1-1-1-1)×ICMS 8511 S1-14-3-1-1-2-B-1]-4-5-2-2-4-B-B (Restoration on A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (118 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 12999 : LaGrap C2-S1-14-4-3-4-1-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (134 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Small (17 cm)
Panicle diameter	Thick (3.8 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (12 gm)



Restorer parent

ICMR 13111 : (ICMV-IS 94206-7 × (SRC II C3 S1-1-1-2 × HHVBC)-1-3-3))-B-10-1-1-5-4-1-1
(Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (124 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Cylindrical
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 13222 : Jakhrana × ESRC II S2-11-B-1-2-1-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Brown
Node pigmentation	Green-Purple
Plant height	Short (137 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Conical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 13444 : (IAC-ISC TCP6 S1-9-1-2-B-4-2-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-11-3-1-B
(Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (143 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Conical-Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 13555 : GB 8735-S1-15-3-1-1-3-4-2-2-1-1-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Purple
Node pigmentation	Green-Purple
Plant height	Short (139 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Conical
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 13666 : ICMS 8511 S1-17-2-1-1-4-1-B-3-2-3-2-B-1-1-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (121 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (14 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Candle-Lanceolate
Panicle density	Semi-compact
Seed color	Cream
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 13777 : (MC 94 C2-S1-3-1-3-3-1-2-1 x SDMV 90031 S1-3-3-2-2-2-2-2)-B-8-2-1
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (126 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (3 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 13888 : (MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-23-4-4-2
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (124 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.9 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 13999 : MDMRRC S1-329-1 (Restoration on A1, A4)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (56 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (122 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial
Panicle length	Medium (22 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 14111 : ICTP 8202 S1-99-2-1-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (113 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (15 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Conical-Lanceolate
Panicle density	Semi-compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 14222 : (EERC-HS-29)-19-3 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (135 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (28 cm)
Panicle diameter	Medium (3 cm)
Panicle shape	Conical-candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 14333 : [(IPC 107 × SDMV 90031-S1-84-1-1-1-1) × AIMP 92901 S1-296-2-1-1-3-B-1]-3-2-2-2-1-B-2 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green-Brown
Plant height	Short (110 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial- Complete
Panicle length	Small (16 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Cylindrical-Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 14444 : JBV 3 S1-18-2-2-2-3-2-3-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (133 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (25 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 14555 : SDMV 95045 S1-7-2-4-2-3-2-1-B-B-B-B-8-1-1-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (179 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 14666 : ICMV 91059 S1-4-2-3-2-1-1-4-B-1-3-B-3 (Restoration on A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Purple
Node pigmentation	Green-Purple
Plant height	Short (127 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Candle-Lanceolate
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 14777 : HHVBC tall (C1) S1-33-3-1-1-1-2-B-B-3-3-2 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (138 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Conical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 14888 : ICMS 8511 S1-17-2-1-1-4-1-B-3-2-3-2-B-1-1-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (127 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (15 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Conical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 14999 : AIMP 92901 S1-480-1-1-2-3-1 (Restoration on A₁, A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (135 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial- Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (3 cm)
Panicle shape	Conical
Panicle density	Compact
Seed color	Deep grey
Seed shape	Obovate
1000-grain weight	Bold (12 gm)



Restorer parent

ICMR 15111 : JBV 3 S1-33-2-1-3-3-B-3-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (120 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (13 cm)
Panicle diameter	Medium (2 cm)
Panicle shape	Cylindrical
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Small (7 gm)



Restorer parent

ICMR 15222 : JBV 3 S1-286-1-1-3-B-8-1-1-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (116 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (15 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 15333 : MRC HS-86-1-1-5-B-B-B-B-B-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (106 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (12 cm)
Panicle diameter	Medium (2 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey brown
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 15444 : [(IPC 337 × SDMV 90031-S1-84-1-1-1-1) × ICMS 8511 S1-14-3-1-1-2-B-1]-4-5-2-2-3-B-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (116 cm)
Number of productive tillers	Low (1)
Panicle exertion	Partial- Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Conical
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 15555 : AIMP 92901 S1-296-2-1-1-4-2-B-12-5-1-3-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (124 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Thick (3.4 cm)
Panicle shape	Conical
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 15666 : [(((IP 12322-1-2) × B-Lines)-B-8) × (MRC S1-155-4-2-B)]-B-14-2-2-1-1-B-4
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (136 cm)
Number of productive tillers	Monoculm (1)
Panicle exertion	Complete
Panicle length	Medium (24 cm)
Panicle diameter	Thick (3.4 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 15777 : MRC S1-9-2-2-B-B-2-B-B-1-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (126 cm)
Number of productive tillers	Low (3)
Panicle exertion	Partial
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.8 cm)
Panicle shape	Lanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 15888 : (MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-28-1-1-B
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (127 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Medium (24 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 15999 : [((MC 94 S1-34-1-B x HHVBC)-16-2-1) × (IP 19626-4-2-3)]-B-1-1-2-3-2-B-1
(Restoration on A₁, A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (123 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Medium (24 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 16111 : (ICMS 7704-S1-18-2-2 × RCB Short)-B-7-2-2-3-4-4-1 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (133 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.2 cm)
Panicle shape	Conical-Candle
Panicle density	Loose
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Small (7 gm)



Restorer parent

ICMR 16222 : MRC S1-340-1-3-3-2-B-B-1 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Purple
Node pigmentation	Green-Brown
Plant height	Short (115 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Conical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 16444 : SDMV 95045 S1-7-2-4-2-3-2-1-B-B-B-B-8-1-1 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Medium (162 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Cylindrical
Panicle density	Compact
Seed color	Deep grey
Seed shape	Obovate
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 16555 : {(SRC II C3 S1-19-3-2 x HHVBC)-1-5-1}x {[(96111b x 4017-6-1-1)-1-4-4-3] x (IP 19626-4-1-2-1)]-B-6}-B-5-1-1-3 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (125 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Candle-Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 16666 : [((MC 94 S1-34-1-B x HHVBC)-16-2-1) × (IP 19626-4-2-3)]-B-1-1-2-1-2-B
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (55 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (126 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Candle
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 16888 : (IPC 1268 × ICMV 91059 S1-58-2-2-2-1)-8-1-1 (Restoration on A₁, A₄, A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (139 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.9 cm)
Panicle shape	Cylindrical
Panicle density	Loose
Seed color	Grey
Seed shape	Elliptical
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 16999 : (IPC 107 ×SDMV 90031-S1-84-1-1-1-1)-1-2-1-2-2-B-B (Restoration on A₁, A₄, A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (141 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Medium (2.3 cm)
Panicle shape	Conical-Candle
Panicle density	Compact- Very compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 17111 : [(((IP 12322-1-2) x B-Lines)-B-8) x (MRC HS-170-3-5-2-B)]-B-5-3-3-1-4-1-1-B
(Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (122 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial
Panicle length	Medium (21 cm)
Panicle diameter	Thick (3.3 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Compact- Very compact
Seed color	Grey brown
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 17222 : Acid tolerant pop S1-7-1-5-2-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (57 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (142 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (24 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Cylindrical-Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 17333 : [(RCB-2 S1-19-2-5-1-1-2-3-3-B-B-B-B x (MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-8-3-1)]-7 (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (125 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Medium (2.9 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 17444 : [(IPC 107 x SDMV 90031-S1-84-1-1-1-1) x AIMP 92901 S1-296-2-1-1-3-B-1]-3-2-2-2-1-B-5 (Restoration on A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (53 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (135 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (18 cm)
Panicle diameter	Medium (2.4 cm)
Panicle shape	Lanceolate
Panicle density	Semi compact-Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 17555 : (IPC 1617 x SDMV 90031-S1-84-1-1-1-1)-26-2-3-1 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (57 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (137 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Candle-Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 17666 : (RCB-2-S1-138-1-3 x MRC-B-2-2-1-B-4-B-1-B-B (Restoration on A₁, A₄))

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (130 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Small (7 gm)



Restorer parent

ICMR 17777 : HiTiP S1-7-3-1-2-1-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (56 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (147 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (21 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Cylindrical-Conical
Panicle density	Semi-compact
Seed color	Yellow brown
Seed shape	Obovate
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 17888 : [(((ICMV-IS 94206-15) x B-Lines)-B-6) x (MRC S1-405-1-2-B)]-B-4-1-1-2-B-5-B
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green-Purple
Plant height	Short (132 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Medium (2.5 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 17999 : [(MC 94 C2-S1-3-1-1-2-3-2-B-1-B-B-B x R-lines bulk 20216-20249/K09)]-12-3
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (129 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Medium (22 cm)
Panicle diameter	Thick (3.6 cm)
Panicle shape	Conical
Panicle density	Semi compact- Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 18111: ICMV 96490-S1-15-4-1-2-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect-Intermediate
Days to 50% Flowering	Early (46 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (104 cm)
Number of productive tillers	Medium (4)
Panicle exertion	Complete
Panicle length	Small (13 cm)
Panicle diameter	Medium (2.1 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 18222: {[(MC 94 S1-34-1-B x HHVBC)-16-2-1] x (IP 19626-4-2-3)]-B-18-2-3-2-2-B x AIMP 92901 S1-296-2-1-1-3-B-1-6-B-B}-B-14-4-3-1-B-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (122 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (16 cm)
Panicle diameter	Thick (3.4 cm)
Panicle shape	Lanceolate
Panicle density	Compact- Very compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 18333: [(IPC 337 x SDMV 90031-S1-84-1-1-1-1) x ICMS 8511 S1-14-3-1-1-2-B-1]-4-5-2-2-3-B-B-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (51 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (117 cm)
Number of productive tillers	Low (2)
Panicle exertion	Partial- Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	NA
Seed shape	NA
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 18444 : [IP 12370-1-3 x B-Lines]-B-14-3-2-1-1-B-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (60 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (146 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (23 cm)
Panicle diameter	Thick (3.3 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 18555: [JBV 3 S1-300-1-1-2-2 x JBV 3 S1-18-1-3-3-2]-B-7-4 x [((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-4-1-3-3-1-2-1-1-1-3 (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (54 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (129 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (27 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Candle
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 18666: AIMP 92901 S1-296-2-1-1-4-2-B-12-5-1-3-B-B (Restoration on A_1 , A_4)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (49 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (125 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Small (17 cm)
Panicle diameter	Thick (3.3 cm)
Panicle shape	Conical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (8 gm)



Restorer parent

ICMR 18777 : ((MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-8-3-1-2-B-B x R-lines bulk (22720-22726/S11))-7-6-2-2-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (47 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (138 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (25 cm)
Panicle diameter	Thick (3.2 cm)
Panicle shape	Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 18888 : [((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3)]-B-18-2-2-4-1-B-B
(Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (59 days)
Anther color	Purple
Node pigmentation	Green
Plant height	Short (145 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (19 cm)
Panicle diameter	Thick (3.4 cm)
Panicle shape	Cylindrical
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 18999 : {[(MC 94 S1-34-1-B x HHVBC)-16-2-1] x (IP 19626-4-2-3)]-B-18-2-3-2-2-B x AIMP 92901 S1-296-2-1-1-2-2}-B-7-1-B (Restoration on A₁, A₄, A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (121 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Candle-Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9.5 cm)



Restorer parent

ICMR 19111 : ((MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-23-4-4-2-B-BxR-lines bulk (22720-22726/S11))-8-5-1-5-B (Restoration on A₁)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (52 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (144 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (22 cm)
Panicle diameter	Medium (2.6 cm)
Panicle shape	Conical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 19222 : (IPC 1617 x SDMV 90031-S1-84-1-1-1-1)-66-1-2-B-B-B (Restoration on A₁, A₄, A₅)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (115 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Small (17 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Cylindrical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Obovate
1000-grain weight	Medium (9.4 gm)



Restorer parent

ICMR 19333 : ((MC 94 C2-S1-3-2-2-2-1-3-B-B x ICMR 312 S1-3-2-3-2-1-1-B-B)-B-22-2-3-3-B-BxR-lines bulk (22680-22692/S11))-2-2-1-4-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (129 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Small (17 cm)
Panicle diameter	Thick (3.3 cm)
Panicle shape	Cylindrical-Lanceolate
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 19444 : ((MC 94 C2-S1-3-2-2-2-1-3-B-B x ICMR 312 S1-3-2-3-2-1-1-B-B)-B-22-2-3-3-B-BxR-lines bulk (22680-22692/S11))-2-4-3-1-B-B (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Late (54 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (134 cm)
Number of productive tillers	Low (3)
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Thick (3.7 cm)
Panicle shape	Lanceolate
Panicle density	Very compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 19555: (MC 94 C2-S1-3-1-1-2-3-2-B-1-B-B-Bx (20216-20249))-4-1-1-2-4 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (48 days)
Anther color	Brown
Node pigmentation	Green
Plant height	Short (130 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Medium (25 cm)
Panicle diameter	Thick (3.5 cm)
Panicle shape	Cylindrical-Lanceolate
Panicle density	Semi-compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (10 gm)



Restorer parent

ICMR 19666: (((((MC 94 S1-34-1-B x HHVBC)-16-2-1) x (IP 19626-4-2-3))-B-18-2-3-2-2-BxAIMP 92901 S1-296-2-1-1-3-B-1-6-B-B)-B-11-2 x (B 282 x S10B-38)-2-1-5-1-1)-2-5-2 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (138 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Medium (21 cm)
Panicle diameter	Thick (3.1 cm)
Panicle shape	Cylindrical
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Bold (11 gm)



Restorer parent

ICMR 19777: {[(MC 94 S1-34-1-B x HHVBC)-16-2-1] × (IP 19626-4-2-3)-B-1-1-2-3-2-B-1 x IP No. 17843-1-1)}-21-2-3-7-B-B (Restoration on A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Very late (55 days)
Anther color	Brown
Node pigmentation	Green-Brown
Plant height	Short (143 cm)
Number of productive tillers	Low (2)
Panicle exertion	Complete
Panicle length	Medium (24 cm)
Panicle diameter	Medium (2.7 cm)
Panicle shape	Cylindrical
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)



Restorer parent

ICMR 19888: ((MC 94 C2-S1-3-2-2-2-1-3-B-B x AIMP 92901 S1-488-2-1-1-4-B-B)-B-8-3-1-2-B-Bx (22720-22726/S11))-8-5-3-5 (Restoration on A₁, A₄)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium(50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (138 cm)
Number of productive tillers	Monoculm
Panicle exertion	Complete
Panicle length	Small (20 cm)
Panicle diameter	Thick (3.2 cm)
Panicle shape	Conical-Candle
Panicle density	Compact
Seed color	Grey
Seed shape	Globular
1000-grain weight	Medium (10 gm)



Restorer parent

ICMR 19999: (MC 94 C2-S1-3-2-2-2-1-3-B-B x ICMR 312 S1-3-2-3-2-1-1-B-B)-B-34-4-2-B-Bx (22669-22675/S11)-5-1-1-3-B (Restoration on A1, A4)

Key Characteristics

Growth habit	Erect
Days to 50% Flowering	Medium (50 days)
Anther color	Yellow
Node pigmentation	Green
Plant height	Short (113 cm)
Number of productive tillers	Monoculm
Panicle exertion	Partial- Complete
Panicle length	Small (20 cm)
Panicle diameter	Thick (3.2 cm)
Panicle shape	Cylindrical-Lanceolate
Panicle density	Compact
Seed color	Deep grey
Seed shape	Globular
1000-grain weight	Medium (9 gm)





About

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a pioneering, international non-profit scientific research for development organization, specializing in improving dryland farming and agri-food systems. The Institute was established in 1972, by a consortium led by the Ford Foundation and the Rockefeller Foundation and with the support from the Government of India. ICRISAT works with global partners to develop innovative science-backed solutions to overcoming hunger, malnutrition, poverty and environmental degradation on behalf of the 2.1 billion people who reside in the drylands of Asia, Sub-Saharan Africa and beyond.

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