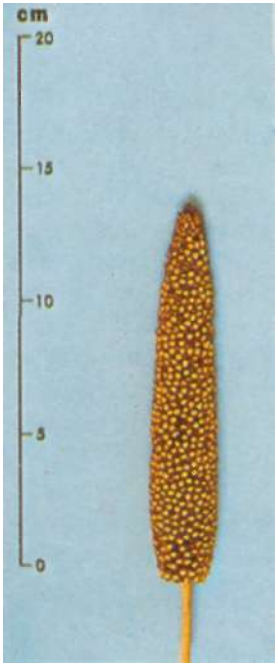
Pearl Millet
Male-Sterile Line ICMA 2
and its Maintainer Line ICMB 2



- A d_2 gene dwarf (ca 0.75 m)
- Tillers profusely (4 tillers per plant)
- Matures early (ca 42 days to flowering)
- Has large grains (ca 12 g 1000^{-1})
- Has good general combining ability
- Can be used to produce short and tall hybrids

ICRISAT

Plant Material Description no. 5

International Crops Research Institute for the Semi-Arid Tropics
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1985

Purpose of Description

ICMA 2 and ICMB 2 (designated as AKM 2068-12-1 and BKM 2068-12-1 by Kansas State University) were jointly issued for breeders' use by Kansas State University and ICRISAT. The All India Coordinated Millets Improvement Project recommended these lines in 1984 for large-scale distribution and utilization in the production of experimental hybrids.

Origin and Development

Seed stocks (designated as AKM 2068 and BKM 2068, respectively) were obtained from Fort Hays Branch Experiment Station, Kansas State University, USA. The maintainer line was derived at Hays, Kansas, by crossing Tift 23DB with PI 185642. Tift 23DB is a maintainer line of Tift 23DA developed at Tifton, Georgia, USA. PI 185642 was collected in 1949 from a market in Kumasi, Ghana, and supplied by the Southern Region, Plant Introduction Experiment Station, Georgia, in 1971. AKM 2068 was derived by backcrossing the initial maintainer line seven times into the cytoplasm of Tift 23DA with continuing pedigree selection. ICMA 2 and ICMB 2 were selected from AKM 2068 and BKM 2068 for downy mildew resistance in the downy mildew nursery at ICRISAT Center following two generations of plant(A) x plant(B) crossing with pedigree selection.

Synonyms. 8A/8B; 843A/843B; AKM 2068-12-1/BKM 2068-12-1.

Performance

Parental lines. The expression of male-sterility of ICMA 2 has remained stable over sites and seasons with good seed-set under open pollination. ICMB 1 is a profuse pollen-shedder. About *5%* downy mildew has been observed in ICMA 2 and ICMB 2 (as compared with 55-75% in the susceptible check hybrid, NHB 3) in the downy mildew nursery at ICRISAT Center. It is as susceptible to ergot and smut as the released and widely used male-sterile lines 5141A and 111A.

Hybrids. In a preliminary yield trial (Trial I) ICMA 2 hybrids yielded more than 5141A hybrids, and the best hybrid on ICMA 2 yielded about as much as the best plot of the highest-yielding check hybrid MBH 110 (Table 1). In another preliminary yield trial (Trial II) with untested pollinators, ICMA 2 hybrids, on the average, yielded 22% less than MBH 110 and the best hybrid on ICMA 2 also yielded 22% less than the highest-yielding plot of MBH 110. In both trials, however, ICMA 2 hybrids yielded at a much higher level than

the widely cultivated commercial hybrid BJ 104. In both trials, ICMA 2 hybrids flowered about 5 days earlier and measured about 40 cm shorter than MBH 110. Being a d_2 gene dwarf, ICMA 2 provides an opportunity for breeders to produce hybrids with a wide height range.

Table 1. Grain yields (kg ha^{-1}) of ICMA 2 hybrids at Hisar, rainy season 1983.

	Trial I[1]		Trial II[2]	
Hybrids	Mean	Range	Mean	Range
ICMA 2 hybrids	2180	1510-2950	2850	910-4000
5141A hybrids	2040	1490-3150	nd	nd
MBH 110 (check)	2431	1770-2970	3650	2610-4630
BJ 140 (check)	1480	950-1760	2280	1280-2720

1. Mean of 18 hybrids on each A line. Three repeat plots of each check in each of the three replications.
2. Mean of 49 hybrids on each A line. Four repeat plots of each check in each of the three replications.

Table 2. Morphological characters of male-sterile line ICMA 2, ICRISAT Center, dry (summer) season 1984.

Character	5141A (check)	ICMA 2
Time to 50% bloom (d)	51	42
Plant height (cm)	85	72
Head length (cm)	15	12
Head girth (cm)	5.2	6.3
Effective tillers/plant	4.0	4.1
1000-grain mass (g)	6.3	12.5

Plant Characters

ICMA 2 and ICMB 2 are d_2 dwarfs, and about 75 cm in height (Table 2). Both lines flower simultaneously and are early in flowering. ICMA 2 tillers profusely (4-5 basal heads/plant) including substantial nodal tillering till the end

of the crop cycle. It has small, well exserted heads with naked pinkish tips. The foliage stays green until near-maturity.

Seed Characters

The grain is bold, 12 g 1000^{-1}, globular, and light gray in color.

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ISBN 92-9066-099-6 ICR 86-0012