

REGISTRATION OF PARENTAL LINES

Registration of Pearl Millet Parental Lines ICMA 88004 and ICMB 88004

ICMB 88004 (Reg. no. PL-24, PI 583799) pearl millet [*Pennisetum glaucum* (L.) R. Br.] is the maintainer line of ICMA 88004 (Reg. no. PL-25, PI 583798), which is the seed parent of the single-cross grain hybrid ICMH 356. ICMB 88004 and ICMA 88004 were released in January 1993 by the Ministry of Agriculture, Government of India ICMB 88004 and ICMA 88004 were developed by the Genetic Enhancement Division, Asia Center, of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Andhra Pradesh, India.

The male-sterile line ICMA 88004 derives its A_1 cytoplasm from 81A (ICMA 1) (1). ICMB 88004 was developed by 10 generations of selfing in a half-sib progeny (Togo-11) of the same early-maturing, large-seeded landrace from northern Togo that was the source of the commercial open-pollinated cultivar ICTP 8203 (2). During the process of inbreeding, visual selection was made for high seed yield potential, large seed size, good selfed seedset, earliness, and high level of resistance to downy mildew [caused by *Sclerospora graminicola* (Sacc.) J. Schrot.], An S_1 progeny (Togo-11-5) derived from the half-sib progeny and its corresponding male-sterile hybrid (81A X Togo-11-5) were established as an A-B pair during the 1981 postrainy season. Individual plants selected from the S_1 progeny were further selfed and backcrossed onto individual plants of the sterile hybrid. This scheme of selection and selfing in the maintainer progeny with concurrent backcrossing onto individual plants of the sterile backcross progeny led to the identification of four pairs of BC_7-S_{10} progenies. On the basis of a higher level of downy mildew resistance and greater general combining ability, one pair, ICMA 88004 and ICMB 88004, was selected in 1988.

In yield trials conducted in 11 year X location environments, ICMA 88004 had a mean seed yield of 191 t ha^{-1} , required 49 d to 50% flowering, and had a mean plant height of 14 in, which were similar to the highest-yielding commercial male-sterile line, ICMA 841 (3). The 1000-seed mass of ICMA 88004 (12.5 g) is 52% higher than that of 841A. During the February 1993 postrainy season planting at ICRISAT Asia Center, flowering of ICMA 88004 under an extended daylength of 15.5 h was delayed by 18 d compared with flowering under the normal daylength of 12.5 h. ICMA 88004 is highly resistant to downy mildew. Disease incidence in 15 downy mildew nurseries in India and in greenhouse inoculation tests at ICRISAT Asia Center varied from 0 to 10% for ICMA 88004, compared with 0 to 25% for ICMA 841 and 29 to 96% in the susceptible hybrid, NHB 3. ICMB 88004 is similar to ICMA 88004 for these characters, except that it flowers 1 to 2 d later. ICMB 88004 is a prolific pollen producer. The stigmas of both lines remain receptive for 2 to 3 d, which is 1 to 2 d less than ICMA 841.

The most distinguishing feature of ICMA 88004 and ICMB 88004 is yellowish seedling foliage color. This is expressed well when daily maximum temperatures are $<40^\circ\text{C}$. Recessive inheritance of this trait permits early detection and removal of off-type plants from seed production plots. The purple color of nodes, basal internodes, flag leaf sheath margin, and glumes is a combination of characters unique to these lines. All of these characters are dominant and hence are expressed in their hybrids. These lines have candle-shaped panicles, 13 to 16

cm in length. Seeds are globular in shape and deep gray in color. Under daily maximum temperatures $>40^\circ\text{C}$, the flag leaves of these lines may display a firing symptom.

Breeder seed of ICMA 88004 and ICMB 88004 will be maintained by the Genetic Enhancement Division, ICRISAT Asia Center, and have been made available to several seed-producing agencies in India. Germplasm quantities of these two lines will be provided for research purposes upon request.

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References and Notes

1. Anand Kumar, D.J. Andrews, R.P. Jain, and S.D. Singh. 1984. ICMA-1 and ICMB-1 pearl millet parental lines with A1 cytoplasmic-genic male sterility system. *Crop Sci.* 24:832.
2. Rai, K.N., K. Anand Kumar, D.J. Andrews, A.S. Rao, A.G.B. Raj, and J.R. Witcombe. 1990. Registration of 'ICTP 8203' pearl millet. *Crop Sci.* 30:959.
3. Singh, S.D., P. Singh, K.N. Rai, and D.J. Andrews. 1990. Registration of ICMA 841 and ICMB 841 pearl millet parental lines with A1 cytoplasmic-genic male sterility system. *Crop Sci.* 30:1378.
4. K.N. Rai, A.S. Rao, and C.T. Hash, Genetic Enhancement Division, ICRISAT Asia Center, Patancheru, AP, 502 324, India. Approved as Journal Article no. 1712 by ICRISAT. Registration by CSSA. Accepted 31 Dec. 1994. *Corresponding author.

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