REGISTRATION OF PARENTAL LINES

REGISTRATION OF 15 SORGHUM A- AND B-LINE INBREDS

The Iowa Agriculture and Home Economics Experiment Station released 15 pairs of A-line (male-sterile) and B-line (maintainer) sorghum [Sorghum bicolor (L.) Moench] inbreds as germplasm in March 1989 (Reg. no. PL-208 to PL-222; PI538360 to PI538374) that provide additional cytoplasmic and genetic diversity. The inbreds IA77 through IA84 were developed by backcrossing to transfer the A3 cytoplasm (7) from A3Tx3197 into several inbreds that are used currently as female parents in Al (milo) cytoplasm (6). Seed of A3Tx3197 (82CS8615 × 8614) was obtained from Dr. F. R. Miller, Texas A&M University, College Station, TX, with the A3 cytoplasm source tracing originally to IS1112C. Inbred Tx3197 was officially released in 1953 (2). Four backcrosses have largely regained the plant phenotype of each recurrent parent, but in the alternative A3 cytoplasm.

Differential responses in pollen fertility were obtained (5) from testcrosses onto female parents with A1, A2 (3), and A3 cytoplasm. Several male parents that restored fertility in A1 or A2 cytoplasm were nonrestorers in A3 cytoplasm, and one inbred restored fertility in A3 but not in A2 cytoplasm. The anthers of inbreds with A3Tx3197 (IS1112C) cytoplasm are small, shrunken, and pale yellow or white. This contrasts with anther characteristics of the A3Tx398 male-sterile inbred registered by Dr. K. F. Schertz, Texas A&M University, College Station, TX. A3Tx398 also has the cytoplasm of IS1112C, but the anthers were described as yellow and intermediate in size.

The inbreds IA85 through IA91 were developed by backcrossing to transfer the A4 cytoplasm (7) from A4Tx398 to several additional genotypes. Seed of A4Tx398 was obtained from Dr. K. F. Schertz, Texas A&M University, College Station, TX. An official release and registration of A4Tx398 has not been made, but Tx398 was released in 1949 (1). The source of A4 cytoplasm originally was IS799. A4 lines are large, yellow, and nondehiscent. Pollen fertility restoration of testcrosses onto male-sterile lines of different cytoplasms differed appreciably from that of crops in Al and A3 cytoplasm male steriles. Among 217 inbreds, four were classified as fertility restorers in A4 cytoplasm. The seed for distribution of IA85 through IA91 are from the BC3 generation.

Designations and parentage of the inbreds IA77 through IA84, and IA85 through IA91, are presented in Table 1 and 2, respectively. The inbreds are available individually or as a group in germplasm amounts (5 g per line) from the Committee for Agricultural Development, 2023 Agronomy Building, Iowa State University, Ames, IA 50011.

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References and Notes