REGISTRATION OF SIX SORGHUM GERMPLASM
RANDOM-MATING POPULATIONS

The USDA-ARS, and the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska, released six sorghum [Sorghum bicolor (L.) Moench] random-mating populations in May 1985. These populations were improved for one or more traits, including animal feed high grain yield. Pedigrees refer to reaction with Al cytoplasm. The diversity of these populations provides useful germplasm to public and private sorghum programs for either inbred line development or continued recurrent selection.

NP3R(S1)C4 (Reg. no. GP-202) was selected from NP3R, released in 1972 (1), after four cycles of SI family testing for increased grain yield. Comparison of the base cycle and the C4 indicated a yield advantage of 28% for the latter. The C4 should equal or exceed the C3. Standability has been materially improved in advanced cycles. The population segregates for ms.

NP5R(S1)C4 (Reg. no. GP-203) is a broad-based population formed by crossing 8 experiment station R lines, 42 partially converted R lines from Texas A&M University, and 59 segregates from R-line crosses made in Africa to ms; segregates in an earlier cycle of NP3R. Random mating and four cycles of SI family testing for yield improvement followed. Yield evaluation of SI families from the C3 revealed a 16% increase over the base. NP5R has high genetic diversity and considerable agronomic variability.

NP12B(S1)C2 (Reg. no. GP-204) was formed by crossing 39 yellow endosperm B-lines from Texas A&M University to ms; segregates in NP12B, also released in 1972 (1). After random mating, fertile plants were screened for absence of rps, recombined, and followed with two cycles of SI family testing for increased protein yield (protein percentage x kg/ha grain yield). NP12B is a source of new B lines, particularly those with yellow endosperm.

NP18B(S1)C2 (Reg. no. GP-205) is a reselection of a composite of PP2B and BR4B, unreleased populations from Purdue University that were developed by crossing sorghum varieties having good grain quality, particularly high grain protein, to ms; segregates in NP18B after recombination and mass selection in Nebraska for shorter plant height and earlier maturity, two cycles of SI family testing were practiced for increased protein yield. NP18B has grain quality attributes that make it a source of useful B lines.

NP20BR(M/S1)C2 (Reg. no. GP-206) is a broad-based population with several grain quality attributes. The population was formed from a composite of the following: A random sample of the unreleased Nebraska population NP7BR(MC3 that had been mass selected for increased grain protein content (1/3); a random sample of the unreleased Nebraska population NP17R that traced to Purdue materials having high grain protein and good grain quality (1/3); a group of F2 populations that had the opaque high lysine line P721 as a common parent (1/6); a random sample of the unreleased Nebraska base population NP13R that was formed from crossing NP3R with a large number of yellow endosperm R lines (1/12); and a random sample of RPIR, released in 1976 (3), for resistance to the greenbug [Schizaphus graminium (Rondani)] (1/12). After random mating, selfed-pollinated-plant mass selection was practiced one cycle for metabolizable energy (a trait involving chemical composition, caloric values, and in vitro digestion), which in turn was followed by one cycle of SI family testing for metabolizable energy. A small frequency of the antherless (al) gene from NP7BR exists in NP20BR, but the primary gene for recombination is ms. Upon inbreeding, NP20BR will provide a higher frequency of R lines than B lines.

NP21R(M)C4 (Reg. no. GP-207) was created by blending equal amounts of seed from 100 F1 experimental hybrids (2) followed by random mating that utilized the ms gene for recombination. Open-pollinated plant mass selection was then practiced for four cycles for increased seeds per panicle and increased 100-seed weight, both of which were significantly above the base population. NP21R has high yield capability, stiff stalk, and is of uniform combine height.

Breeders seed quantities of each population may be obtained from the USDA-ARS Sorghum and Wheat Research Unit, Department of Agronomy, University of Nebraska, Lincoln, NE 68583.

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References and Notes

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REGISTRATION OF RP2B(S1)C3(ECB) AND RP4BR(S1)C3(ECB) SORGHUM GERMPLASM

The Iowa Agriculture and Home Economics Experiment Station; the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska; and the USDA-ARS released two sorghum [Sorghum bicolor (L.) Moench] random-mating populations in June 1985 that carry resistance to second-generation (infestation during anthesis) European corn borers [Ostrinia nubilalis (Hubner)]. These populations represent the first attempt to improve sorghum through recurrent selection for resistance to this insect. They carry RP (regional population) designations.