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REGISTRATION OF NP36 AND NP37, TWO RANDOM-MATING GRAIN SORGHUM POPULATIONS SELECTED FOR REDUCED DHURRIN CONTENT

NP36 AND NP37 GRAIN SORGHUM [*Sorghum bicolor* (L.) Moench] (Reg. no. GP-244 and GP-245; PI 535780 and PI 535781), two random-mating populations of grain sorghum, were developed cooperatively by the USDA-ARS and the Nebraska Agricultural Research Division and were released in April 1989. Both populations were selected for reduced dhuririn content, and they have potential value as sources of A- and B-lines of grain sorghum for use in producing low-dhuririn sorghum-sudangrass hybrids. NP37 also contains the *bmr-6* gene for brown midribs and, therefore, may be useful in producing sorghum-sudangrass or forage sorghum hybrids with brown midribs.

NP36 was selected from the population, RP2B (2), which was released in 1976 for greenbug [*Schizaphis graminum* (Rondani)] biotype C resistance. The source population of RP2B used in the development of NP36 also had undergone a single cycle of selection for resistance to the European corn borer [*Ostrinia nubilalis* (Hubner)]. NP36 has undergone eight cycles of S_1 family selection for lower dhuririn content. Two replications of 400 families in each cycle were assayed for dhuririn as measured by hydrocyanic acid potential (HCN-p), and remnant seed of the lowest 10% was composited and planted in isolation for random mating. Equal amounts of half-sib seed, harvested from approximately 500 genetic male-sterile (*ms_3*) plants, were bulked to constitute recombinant seed for that cycle. The bulked half-sib seed was planted in the USDA-ARS winter nursery in Puerto Rico, and S_1 families were generated for the next cycle of selection. With selected S_1 families being recombined in isolation in Nebraska during the summer months, and S_1 families being generated in Puerto Rico and assayed for HCN-p in Nebraska during the winter and spring months, one full cycle per year was obtained. Through 1988, eight full cycles of selection had been completed. The spectrophotometric assay for HCN-p (1) of 1-wk-old seedlings of the half-sib bulks from all cycles of selection except C_8 (which was not yet available when the assay was run), grown in the same test, resulted in the following values for means and standard errors (mg kg⁻¹ fresh weight, bulk of 10 seedlings per replication, six replications): Cycle C_0 —1035 \pm 27, C_1 —854 \pm 41, C_2 —768 \pm 36, C_3 —751 \pm 36, C_4 —660 \pm 10, C_5 —585 \pm 22, C_6 —561 \pm 23, C_7 —536 \pm 10, B-‘CK60’—1261 \pm 85, B-‘Redlan’—1124 \pm 50. The C_7 half-sib bulk had approximately 52% of the HCN-p found in the C_0 cycle. There was a decrease in HCN-p for each cycle of selection with an average decrease of 6.9% per cycle. The HCN-p of C_7 was 43 and 48%, respectively, of the values found in B-CK60 and B-Redlan. The released seed, a composite of half-sib seed harvested from male-sterile plants in Cycle 8, has not been assayed for HCN-p. The population segregates for genetic male-sterility (*ms_3*) has green midribs and purple plant color, white to brown caryopsis color, and averages 100 cm in height at maturity.

NP37 was formed by combining two random-mating populations of grain sorghum; one containing the *bmr-6* gene for brown midribs, the other being derived from population RP2B. The *bmr-6* gene was obtained from *bmr-6* B-Redlan germplasm developed at the Purdue Agricultural Experiment Station. Each of the two populations had undergone a single cycle of S_1 family selection for lower dhuririn content before being combined and three additional cycles after being combined. During the first random mating after the populations were combined, seed was harvested only from brown midrib plants that were also male-sterile. A bulk of the seed from male-sterile plants was planted in the USDA-

ARS winter nursery in Puerto Rico, and S_1 families were generated for the next cycle of selection. The S_1 families were assayed for dhurrin content, and remnant seed of the selected families was bulked and planted in isolation in Nebraska. All plants other than those with brown midribs were eliminated prior to anthesis so that random mating occurred only among brown midrib plants. The spectrophotometric assay for HCN-p of 1-wk-old seedlings, grown in the same test, resulted in the following values for means and standard errors (mg kg^{-1} fresh weight, bulk of 10 seedlings per replication, three replications): NP37 male-sterile bulk— 597 ± 30 , B-CK60— 1185 ± 15 , B-Redlan— 1043 ± 34 . The released seed is a composite of half-sib seed harvested from male-sterile plants in the third cycle after the two populations were combined. The population segregates for genetic male-sterility (ms_3), has brown midribs, purple plant color, white caryopsis color, and averages 110 cm in height at maturity.

Seed of NP36 and NP37 will be maintained and distributed by the Department of Agronomy, University of Nebraska, Lincoln, NE 68583. Germplasm amounts will be provided without cost to each applicant upon written request while supplies last. Recipients of seed are asked to make appropriate recognition of the source of the germplasm if it is used in the development of a new germplasm, parental line, cultivar, or hybrid.

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References and Notes

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