5-1990

Registration of NP28 Sudangrass Germplasm, A Composite of 90 Low-Dhurrin Self-Pollinated Lines

Herman J. Gorz
United States Department of Agriculture

Francis A. Haskins
University of Nebraska - Lincoln, fhaskins@neb.rr.com

K. P. Vogel
United States Department of Agriculture, Ken.Vogel@ars.usda.gov

REGISTRATION OF NP28 SUDANGRASS GERMPLASM, A COMPOSITE OF 90 LOW-DHURRIN SELF-POLLINATED LINES

NP28 SUDANGRASS [*Sorghum bicolor* (L.) Moench] [formerly *S. sudanense* (Piper) Staph] (Reg. no. GP-236, PI 535772), a population developed cooperatively by the USDA–ARS and the Nebraska Agricultural Research Division, was released in April 1989. NP28 is a composite consisting of equal quantities of seed of 90 low-dhurrin, highly self-pollinated lines of sudangrass. Each of the lines was derived by seven or more generations of selfing following one or more crosses among seven sources of sudangrass germplasm. The sources included low-dhurrin selections from 'Piper'; low-dhurrin breeding lines from the University of Wisconsin; two sudangrass B-lines (maintainers for A1 cytoplasm) obtained from commercial sources; and three sudangrass cultivars (Piper, 'Greenleaf', and 'Sweet') that contained the ms_3 gene for genetic male-sterility. The ms_3 gene was obtained from Kansas lines that were derived from an initial cross and one backcross of the above three cultivars to NP2B (2), a random-mating population of sorghum (*S. bicolor*). About 20% of the composite of 90 lines resulted from crosses that involved male-sterile (ms_3ms_3) segregates as female parents, but the frequency of the ms_3 allele in the self-pollinated lines being released is unknown.

Each of the 90 lines contains germplasm from low-dhurrin selections of Piper and from at least one of the sudangrass B-lines. In addition, some lines contain one or two of the five other sudangrass sources listed above. The means ± SE and ranges, respectively, for various traits found in the 90 lines are as follows: height at maturity (cm)—199 ± 1.6, 150–220; maturity (days to anthesis)—59 ± 0.3, 53–66; and dhurrin level as measured by hydrocyanic acid potential [mg kg^{-1} fresh weight, based on a spectrophotometric assay (1) of extracts from first leaves of 1-wk-old seedlings, with one replication of a bulk of ten seedlings from each of the 90 lines]—163 ± 4.9, 84–286. All lines have tan plant color, glumes that are mostly straw colored, brown caryopsis color, and the midribs of leaves of all but one line are white with green midribs in the remaining line.

Since each of the lines is essentially homozygous, self-pollination of plants grown from the released seed will produce true-breeding lines that can then be evaluated for a variety of characteristics. Similarly, the pollen from individual plants being self-pollinated can also be used to produce experimental hybrids. The B or R reaction of the lines composited to make up NP28 is unknown and none of the lines has been evaluated for yield potential as pure lines or as hybrids. Many lines with foliar diseases were eliminated early in the selection process, but the reactions of the released lines to specific diseases also are unknown.

NP28 should have value primarily as a source of low-dhurrin lines and possibly also for deriving low-dhurrin sudangrass maintainer lines for A1 cytoplasm. The homozygosity of these lines also is of value because a large number of true-breeding lines can be generated with one generation of selfing. Seed of NP28 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.

H.J. GORZ,* F.A. HASKINS, AND K.P. VOGEL (3)

References and Notes

1. Gorz, H.J., W.L. Haag, J.E. Specht, and F.A. Haskins. 1977. Assay of *p*-hydroxybenzaldehyde as a measure of hydrocyanic acid potential in sorghums. Crop Sci. 17:578–582.
2. Nordquist, P.T., O.J. Webster, C.O. Gardner, and W.M. Ross. 1973. Registration of three sorghum germplasm random-mating populations. Crop Sci. 13:132.
3. H.J. Gorz (retired) and K.P. Vogel, USDA-ARS; and F.A. Haskins (retired), Dep. of Agronomy, Univ. of Nebraska, Lincoln, NE 68583. Cooperative investigations of USDA-ARS and the Nebraska Agric. Res. Division. Published as Journal Series Paper no. 8935, Nebraska Agric. Res. Division. Registration by CSSA. Accepted 31 Aug. 1989. *Corresponding author.

Published in Crop Sci. 30:758 (1990).