REGISTRATION OF PARENTAL LINES

Registration of N211, N217, and N218
Parental Inbred Lines of Maize

Inbreds N211 (Reg. no. PL-288, PI 596354), N217 (Reg. no. PL-289, PI 596356), and N218 (Reg. no. PL-290, PI 596357) are yellow-dent maize (Zea mays L.) lines developed and released by the Nebraska Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska. N211 was released on 27 Mar. 1994, and N217 and N218 were released on 14 Mar. 1995, based on their potential as parents in hybrid seed production and as germplasm sources to be used in maize breeding programs. Selection of these lines was specifically based on their response to challenge by the component pathogens of corn lethal necrosis (CLN), maize chlorotic mottle virus (MCMV), and maize dwarf mosaic virus Race B (MDMV-B).

N211 was derived by self-pollination within an S2 family selected from NCLNA, a non-Stiff Stalk synthetic. This S2 was one of 10 component families of NCLNA Cycle 1 selected based on both disease resistance and testcross yield. The line was advanced ear-to-row by self-pollination to S5, with selection based on testcross performance. Additional selection among a group of S5 lines was based on corn lethal necrosis symptom development. Selfed progeny from the selected S5 plant were sibbed to increase seed. Seed is currently maintained by sibbing and bulking.

Based on measurements in Lincoln, NE, during 1993 and 1994, N211 averaged 190 cm in height. Plants are topped by a large tassel with green anthers and three to five branches. The ear has 12 to 14 kernel rows with relatively small kernels on a light red cob. N211 has excellent staygreen characteristics and requires 1410 heat units to pollen shed (AES 700). In hybrid combination, N211 has somewhat more moisture at harvest than later-flowering lines (e.g., B73), probably due to health of the plant after physiological maturity of the grain and a somewhat tight husk.

Based on greenhouse evaluations, N211 exhibits very good resistance to MCMV and moderate resistance to MDMV-B. Due to combined resistances, N211 exhibited relatively little CLN symptom development when evaluated in hybrid combination in replicated field plots mechanically inoculated with MCMV and MDMV-B. In the 1995 University of Nebraska Corn Lethal Necrosis Test (1), N211×N218 had the best disease rating and was ranked in the top 5% for grain yield in inoculated plots. The hybrid N211×N217 showed few CLN symptoms in this trial, but was among the lower yielding hybrids in uninoculated plots. N211×N217 generally does not yield as well as other hybrid combinations in the absence MDMV-B and MCMV infection. N209×N211, in the same trial, showed few CLN symptoms, and ear-to-row by self-pollination to S5 with selection for performance at each stage of inbreeding. Additional selection of S5 families was based on CLN symptom severity and general plant health. Seed was increased by sib-mating self-selected S5 plants. The inbreds are currently maintained by sibbing and bulking.

N217 and N218 are S5 lines averaging 180 and 170 cm in height, respectively, at Lincoln, NE, in 1992. They are classified in the AES 700 maturity grouping. N217 has a medium mature tassel with five to seven branches that sheds ample pollen. It has some prolific tendency, and a silk delay of 1 to 2 d has been observed under hot, dry environmental conditions. N218 has 12 to 14 kernel rows, pink cobs, and yellow kernels. Silks and anthers are green. N217 has a medium to large tassel with three to five tassel branches. Plants generally have 12 to 14 kernel rows and a pink cob. Silks and anthers are green. Based on replicated greenhouse performance at each stage of inbreeding, N217 and N218 have moderate resistance to MCMV, good resistance to MDMV-B, and moderate resistance to CLN.

N217 and N218 produce high grain yield and show good general plant health when crossed to LH51, based on Nebraska locations. Plants at these locations were tested for general plant health. Seeds were used for evaluation during line development. As parents in hybrid combinations, N217 and N218 crossed to N211 showed few CLN symptoms and should be useful in areas such as the Republican River valley of Nebraska and Kansas, where CLN is a problem. N218×N211 exceeds N217×N211 in grain production, with the CLN component pathogens. N218 has shown better resistance to MDMV-B.

N218 would be best adapted to south-central Nebraska and east toward the central U.S. Corn Belt. Breeder seed will be maintained by the Department of Agronomy, University of Nebraska-Lincoln, Lincoln, NE 68520-0722. Recipients of seed are asked to make appropriate recognition of the origin and if it is used to develop a new population, parentage.

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References and Notes
1. Doupnik, B. 1994. Corn lethal necrosis tests. Univ. of Nebraska Agronomy Dept. Series no. 11738. Registration by CSSA. Accepted 31 July 1997. *Corresponding author (smkaeppl@fac.stat.wisc.edu).
2. S. M. KAEPPLER, Dep. of Agronomy, Univ. of Wisconsin, Madison 53706-1597; D. D. GALUPHA, W. A. COMPTON (retired), Dep. of Agronomy, University of Nebraska, Lincoln, NE 68583-0915 and distributed upon written request. Recipients of seed are asked to make appropriate recognition of the origin and if it is used to develop a new population, parentage.