Registration of Parental Lines

REGISTRATION OF ND252, ND253, AND ND254
PARENTAL LINES OF MAIZE

ND252, ND253, and ND254 are yellow dent (Zea mays L.) (Reg. no. PL64, PL65, and PL66) inbred lines developed at the Agricultural Experiment Station, North Dakota State University, Fargo. These lines, alone and in hybrid combinations, were evaluated for yield and agronomic performance. ND252, ND253, and ND254 were released because of their apparent potential as parents to produce early hybrids with good yields, low ear moisture, and good resistance to lodging. These inbreds are adapted to short season areas such as central and eastern North Dakota.

ND252 (Reg. no. PL64) was selected from a cross of two Wisconsin inbreds (W775 × W771), and is a sister line to ND245 and ND246. It was self-pollinated for eight generations with selection for desired plant and ear traits. ND252 silks about 5 days later than ND245 and about 4 days earlier than CM105 at Fargo, N. Dak. This inbred typically produces medium-short plants with ears borne slightly above midway up the stalk. Plants have short, wide leaves and medium-sized tassels. Long, slender ears have 10 to 14 rows of shallow kernels borne on medium long shanks. ND252 was rated moderately resistant to head smut [caused by Sphecoleotheca reitiana (Kuhn) Clint], intermediate in reaction to common smut [caused by Ustilago maydis (DC) Cda.], and resistant to common rust (caused by Puccinia sorghi Schw.) in a 1981 trial (1). In diallel tests in eastern and central North Dakota, ND252 contributed low ear moisture at harvest and good resistance to stalk and root lodging to its hybrids. General combining ability (GCA) effects for yield tended to be higher than those for sister lines ND245 and ND246. Maturity classification of ND252 is AES200.

ND253 (Reg. no. PL65) was selected from (W59 × W116), a cross of two early Wisconsin inbreds. It was self pollinated for eight generations with selection for plant and ear traits during each generation. ND253 produces medium-height plants with similar ear placement as ND252. Plants have large tassels and long, narrow leaves. Ears with 14 to 18 rows of medium-sized kernels are borne on short shanks. ND253 plants silk about 8 days later than ND252 plants. In North Central Corn Breeding Research Committee (NCR-2) tests in 1982, ND253 was rated resistant for wheat streak mosaic virus (WSMV); intermediate for Diplodia stalk rot [caused by Diplodia maydis (Berk.). Sacc.], maize dwarf mosaic virus (MDMV), corn lethal necrosis (CLN) [a combination of maize chlorotic virus (MCMV) and either WSMV or MDMV], Southern leaf blight [caused by Helminthosporium maydis (Nisik and Miyake)], and resistance to first generation of European corn borer (Ostrinia nubilalis Höhner), and susceptible to maize chlorotic dwarf virus (MCDV), Northern leaf blight (caused by Helminthosporium turicium Pass.), and eyespot (caused by Kabatiaella zeal Narita and Kiratsuka). ND253 had moderately high stalk crushing strength and intermediate root pulling resistance. In North Dakota trials (1), this inbred was rated moderately resistant to head smut, common smut, and common rust. ND253 produced high GCA effects for yield and near-average GCA effects for ear moisture at harvest in diallel trials. It had the best GCA effects for stalk lodging and above average GCA for root lodging resistance in an 11 parent diallel grown in 1982. ND253 is late AES200 or early AES300 maturity.

ND254 (Reg. no. PL66) was selected from Rumanian Syn. D with seven generations of self-pollination and selection for plant and ear traits. ND254 plants silk about the same time as ND252 plants and are very short with ear placement slightly below midpoint of the stalk. Plants have short, wide leaves and medium-sized tassels. Medium-long ears with 16 to 20 rows of small kernels are borne on medium-long shanks. In the 1982 NCR-2 trials, ND254 was rated resistant to WSMV; moderately resistant to first generation European corn borer; intermediate for MDMV, CLN, and eyespot; and susceptible to MCDV, Northern leaf blight, Southern leaf blight, Diplodia stalk rot, and second generation European corn borer. It was rated low for stalk crushing and root pulling resistance. In North Dakota trials (1), ND254 appeared resistant to head smut, moderately resistant to common rust, and somewhat susceptible to common smut. Hybrids involving ND254 in diallel studies were high yielding, near average for ear characteristics of PI 466705 are quite similar to those of Daws.

Small amounts of seed can be obtained from the Wheat Breeding and Production Unit of the USDA-ARS, Pullman, WA 99164, which will maintain seed of the two lines.

C. J. Peterson, Jr., R. E. Allan, J. A. Hoffmann, AND R. J. Metzger (1)

References and Notes


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