Registration of R228, R229, and R230 Parental Lines of Maize

R228 (Reg. no. PL-177, PI 592733), R229 (Reg. no. PL-178, PI 592734), and R230 (Reg. no. PL-179, PI 592735) are maize (Zea mays L.) inbreds developed by the Illinois Experiment Station of the University of Illinois at Urbana-Champaign, Urbana, IL, and released on 11 Apr. 1995. The three inbreds have potential value as sources of useful alleles to improve inbreds of Stiff Stalk and Lancaster genetic background. The inbreds were developed by crossing B73 or Mo17 to three Brazilian inbreds (1). The F1 crosses and one backcross to B73 or Mo17 were made by W.J. da Silva (Instituto de Biologia, Unicamp, Campinas, São Paulo, Brazil) in 1985 and 1986. One additional backcross was made to B73 at Urbana, IL, in 1986 during the development of R229 and R230. The three Brazilian inbreds were developed by da Silva and used in Brazilian double-cross hybrids. Pedigree selection for the recurrent parent phenotype and multiple leaf and stalk-rot resistance occurred during inbred development from the S1 to the S4 generations. Leaf diseases included (i) northern leaf blight [caused by Exserohilum turcicum (Pass.) K.J. Leonard & E.G. Suggs], (ii) Races 0 and 1 of southern leaf blight [caused by Bipolaris maydis (Nišikado & Miyake) Shoemaker], (iii) Races 1, 2, and 3 of northern corn leaf spot [caused by Bipolaris zeicola (G.L. Stout) Shoemaker], (iv) anthracnose leaf blotch [caused by Colletotrichum graminicola (Ces.) G.W. Wils.], and (v) eyespot [caused by Aureobasidium zeae (Narita & Hiratsuka) J.M. Dingley; syn. Kabatiella zeae Narita & Hiratsuka]. Plants were inoculated in the leaf whorl at the five-to-seven-leaf stage each generation. The inoculum contained ground leaf tissue collected from diseased plants the previous year, along with various other leaf pathogens grown on sterilized oat (Avena sativa L.) (2). Plants with the smallest amount of leaf area blighted were selfed at anthesis. Ten to 20 d after anthesis, the selfed plants were inoculated with spores from stalk-rot organisms. The spore suspension contained diplodia stalk rot [caused by Stenocarpella maydis (Berk.) Sutton; syn. Diplodia zeae (Schwein.) Lév.], anthracnose stalk rot [caused by Colletotrichum graminicola (Ces.) G.W. Wils.], giberella stalk rot [caused by Gibberella zeae (Schwein.) Petch], and fusarium stalk rot [caused by Fusarium moniliforme J. Sheld.]. Selection was for multiple disease resistance (1), recurrent parent phenotype, and early flowering during segregating generations. Ear-to-row selection was used in all generations of inbreeding, with selection first between and then within rows from the S1 to S4 generations.

R228 seed source was Mol7(900)Mol7BC1S6. The Brazilian inbred 900 was developed from the cultivar São Simão, a Cateto type. Plant type is similar to Mo17, but about 8 cm taller and later in maturity. R228 tassels and silks on the average 6 d later than Mo17. Tassels have yellow anthers, and silks are pink. Ears have 10 to 14 kernel rows, with white cobs and semident kernels. Average leaf area blighted for R228 was 25% in mid-September, vs. 63% for Mo17. R228 combines well with inbreds from Stiff Stalk genetic background. Three-year average grain yield (1991 to 1994) for the commercial hybrid. Maturity classification for R228 is AES800. Stalk lodging was comparable to commercial hybrids. R228 × LH217 had 1.0% stalk lodging, vs. 3.5% for a good commercial single-cross hybrid. R228 could serve as a good gene source to improve inbreds of Sooner-type inbreds.

R229 seed source was B73(479)B73BC2S. The Brazilian inbred 479 was derived from the cultivar San Luis Potosi type. Plant phenotype of R229 is similar to B73, with white cobs and yellow semident kernels. Plants of R229 tassel and silk about 5 to 7 d later than B73. Ear type is distinct from B73, with white cobs and yellow hard-textured dent-type kernels. Leaf area blighted of R229 was 67%, compared with 78% for B73 in mid-September. The inbred combines well with lines of both genetic backgrounds. R229 × LH217 produced a yield of 12.7 t ha⁻¹ (1993 to 1994), compared with 12.9 t ha⁻¹ for a good commercial single cross (1). Harvest grain moisture was higher for R229 × LH209: 22 g kg⁻¹ vs. 204 g kg⁻¹ for the commercial hybrid. Maturity classification for R229 is AES900. Stalk lodging was comparable to commercial hybrids. R229 × LH217 had 2.1% stalk lodging, vs. 2.5% for the commercial hybrid. R229 would be a good gene source for improving inbreds of Stiff Stalk genetic background.

R230 seed source was B73(509)B73BC2S. The Brazilian inbred 509 was developed from the cultivar Azteca type. Plant type is similar to B73, with white cobs and yellow semident kernels. Plants of R230 tassel and silk about 5 to 7 d later than B73, except that the inbred 900 was developed from the cultivar Sao Simao, a Cateto type. Plant type is similar to B73, except that R230 has white cobs, 14 to 16 kernel rows, white cobs, and yellow semident kernels. Leaf area blighted in mid-September was 62% for R230 vs. 63% for Mo17. In field trials conducted in 1991 to 1993, hybrid R230 averaged 10.2 t ha⁻¹, compared with an average of 10.1 t ha⁻¹ for two commercial check hybrids (1). Stalk lodging for R230 × LH217 was similar to the average of the commercial hybrids. Harvest grain moisture was similar to commercial checks (198 vs. 191 g kg⁻¹). Maturity classification for R230 is AES900. R230 could serve as an allele source for improving inbreds of Stiff Stalk genetic background.

Breeder seed of R229, R228, and R230 is available in 100-kernel lots from the corresponding author.

References and Notes