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Registration of B110, B111, B113, and B114 inbred lines of maize

Abstract

Inbreds B110 (Reg. no. PL-297, PI 607381), B111 (Reg. no. PL-298, PI 607382), B113 (Reg. no. PL-299, PI 607383), and B114 (Reg. no. PL-300, PI 607384) are yellow dent maize (*Zea mays* L.) lines developed cooperatively by the Iowa Agriculture and Home Economics Experiment Station and USDA-ARS. The lines were released 15 May 1998 because of their potential value as sources of germplasm in pedigree-selection breeding programs.

Disciplines

Agricultural Science | Agronomy and Crop Sciences | Plant Breeding and Genetics

Comments

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REGISTRATION OF PARENTAL LINES

Registration of B110, B111, B113, and B114 Inbred Lines of Maize

Inbreds B110 (Reg. no. PL-297, PI 607381), B111 (Reg. no. PL-298, PI 607382), B113 (Reg. no. PL-299, PI 607383), and B114 (Reg. no. PL-300, PI 607384) are yellow dent maize (*Zea mays* L.) lines developed cooperatively by the Iowa Agriculture and Home Economics Experiment Station and USDA-ARS. The lines were released 15 May 1998 because of their potential value as sources of germplasm in pedigree-selection breeding programs.

B110 was derived by single-seed descent from BS13(S)C5, a strain of BSSS that has undergone 12 cycles of recurrent selection primarily for grain yield (1). [BS13(S)C5-12-2] was selected because of its testcross performance with Mo17 at the S₃ generation ($F = 0.875$). On the basis of testcross performance, this line was advanced ear-to-row by five generations of self-pollination in a breeding nursery and included in a crossing nursery to produce single-cross seed with B97. The single cross, B97/B110, was included in yield trials conducted in 1994 (nine locations), 1995 (seven locations), 1996 (nine locations), and 1997 (14 locations). It exceeded the experiment mean in each year and was equal to the average of three commercial single-cross checks across locations and years. Grain moisture at harvest, root lodging, and stalk lodging were 2.4, 13.6, and 5.6% greater, respectively, than the average of the commercial hybrids averaged across locations and years.

B110 (an S₁₀ line) is a vigorous line that has excellent plant health with above average resistance to first- and second-generation European corn borer (*Ostrinia nubilalis* Hübner) and early infection by gray leaf spot (*Cercospora zea-maydis* Tehon & Daniels) and northern corn leaf blight [*Exserohilum turcicum* (Pass.) K.J. Leonard & Suggs]. Plant and ear heights and flowering date of B110 are similar to those for B73 and Mo17. Pollen production is good, and silk emergence coincides with pollen shed. B110 has ears with 16 rows of yellow-dent kernels on pink cobs, and its grain yield is similar to B84. Performance of B110 in crosses is similar to other lines of BS13 origin. Maturity classification is AES 700-800.

B111 was derived by single-seed descent from BSSS(R)C9, a strain of BSSS that had undergone nine cycles of reciprocal half-sib recurrent selection with BSCB1(R) as the tester for BSSS(R) (2,3). After seven generations of self-pollination without selection during inbreeding, the line [BSSS(R)C9-107-1-1-2-1] was evaluated in testcross with Mo17. Based on testcross performance, the line was included in a crossing nursery to produce the single-cross with B97. The B97/B111 single cross was included in trials conducted in 1994 (four locations), 1995 (seven locations), 1996 (nine locations), and 1997 (14 locations); average root lodging (7.6%) and yield (9.16 Mg ha⁻¹) of B97/B111 were similar to average root lodging (4.5%) and yield (9.12 Mg ha⁻¹) of three commercial hybrids included as checks in all trials, but grain moisture and stalk lodging for B97/B111 were 2.8 and 6.2%, respectively, greater than the average of the three commercial check hybrids.

B111 (an S₁₂ line) is a vigorous, healthy line that may possess tolerance to the European corn borer, gray leaf spot, and northern corn leaf blight. Plant and ear heights and flowering dates of B111 are similar to those for B73 and Mo17. Pollen

production is good, and silk emergence coincides with pollen shed. B111 has ears with 14 rows of yellow-dent kernels on pink cobs. Grain yield of B111 itself is less than that of B73 and B110, but B111 exhibits good performance in crosses. Maturity classification is AES 700-800.

B113 was derived from BS11(FR)C9, a strain of BS11 that had undergone nine cycles of reciprocal full-sib recurrent selection with BS10 as the tester for BS11 (4). B113 was developed from one of the lines [BS11(FR)C9-3237-12-1] that was included in the intermatings that formed BS11(FR)C10. This line was evaluated in testcross with B73 at the S₂ generation. On the basis of testcross performance, the line was advanced ear-to-row by seven generations of self-pollination in a breeding nursery and included in a crossing nursery to produce single-cross seed with B73, B84, B105, and four recycled B73 lines. Single-cross trials were conducted in 1996 (six locations) and 1997 (four locations). Yields (8.22 Mg ha⁻¹) of the single crosses that included B113 as one parent were similar to the yields (8.04 Mg ha⁻¹) of three commercial check hybrids, averaged across locations and years. Percentages of grain moisture, root lodging, and stalk lodging were 3.6, 4.0, and 3.9%, respectively, greater than the average of the commercial check hybrids with similar percentages of dropped ears. B113 has good combining ability with lines that include BSSS germplasm.

B113 (an S₉ line) is a vigorous line with excellent plant health and leaves that have an upright orientation with light green color. It seems to have above-average tolerance to first- and second-generation European corn borer, gray leaf spot, and northern corn leaf blight. Excellent stay-green is maintained throughout the growing season. B113 has good pollen production, and silk emergence coincides with pollen shed. Grain yield of B113 itself is similar to that of B73. Ears have 16 to 18 rows of semi-dent kernels on red cobs. Date of flowering is similar to B73 and Mo17. Maturity classification is AES 800.

B114 was derived from the same program that developed B103, B107, and B108 (5,6). B114 was developed from a line (CIMMYT Pool 41-C15-19-2-1-1-1-1-1) that was testcrossed with A632 at the S₅ generation. On the basis of testcross performance, the line was advanced ear-to-row by self-pollination in a breeding nursery and included in the crossing nurseries to produce single-cross seed with A632, A681, B100, B104, B105, and W570. Single-cross trials were conducted at five locations in northern Iowa in 1994, 1995, and 1997. Average yield across locations and years of single crosses that included B114 as one parent was 8.58 Mg ha⁻¹ compared with the average yield of 8.94 Mg ha⁻¹ for the commercial check hybrids. Average performance of B114 crosses for other agronomic traits was similar to the average of the commercial check hybrids, except B114 crosses had 5.4% greater stalk lodging.

B114 (an S₁₀ line) has good pollen production, silk emergence coincides with pollen shed, and flowering date is similar to B73 and Mo17. B114 seems to contribute to fast dry-down in crosses. Grain yield of B114 itself is similar to A632. Ears have 12 to 14 rows of yellow, semi-dent kernels on pink cobs. B114 is susceptible to second-generation European corn borer, but it seems to have tolerance to first-generation European corn borer, gray leaf spot, and northern corn leaf blight. Maturity classification is AES 500-600.

Seed of B110, B111, B113, and B114 is maintained by the Iowa Agriculture and Home Economics Experiment Station and is distributed upon request (100 seeds per request) by the Committee for Agricultural Development, 117 Curtiss Hall, Iowa State University, Ames, IA 50011-1010.

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7. A.R. Hallauer and P.R. White, Dep. of Agronomy, Iowa State Univ., Ames, IA 50011; K.R. Lamkey, USDA-ARS, Corn Insects and Crop Genetics Res. Unit, Ames, IA 50011. Joint contribution from the Corn Insects and Crop Genetic Research Unit, USDA-ARS, Dep. Agronomy, Iowa State Univ. and Journal Paper no. J-17796 of the Iowa Agric. and Home Econ. Exp. Stn., Ames, IA. Project no. 3495. Registration by CSSA. Accepted 31 Mar. 2000. *Corresponding author (mlents@iastate.edu).

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