REGISTRATION OF PA778 AND PA860 PARENTAL LINES OF MAIZE

PA 778 (Reg. no. PL-162, PI 560081) and PA860 (Reg. no. PL-163, PI 560082) are yellow dent maize (Zea mays L.) inbreds developed at the Pennsylvania State University Agricultural Experiment Station. They were released in November 1991.

PA778 is an AES700 maturity line that was developed by crossing C103 to a source of the H95 gene. This F1 was then crossed to a C103 outcross that had good resistance to northern leaf blight (NLB) caused by Exserohilum turcicum (Pass.) K.J. Leonard & E.G. Suggs and excellent stalk strength. The combination was then backcrossed to a C103 derivative with the H1 gene. After selfing and selection in an ear-to-row manner for five generations, the line was evaluated first in a topcross test and then in several single cross combinations for grain yield, grain moisture, stalk strength, and disease reaction.

PA778 is shorter than C103, attaining a height of ≈130 to 140 cm, with ear placement at 65 to 70 cm. The plant produces a medium-green, spreading leaf and a medium-sized, spreading tassel. It is similar to C103 in grain yield and kernel type. The ears have ≈14 rows of medium-yellow dent kernels. The line silks 3 to 6 d earlier than C103 or Mol7. It has demonstrated good stalk strength as an inbred per se and in various crosses. In our tests, it has shown good resistance to northern leaf spot (NLS) caused by Bipolaris zeicola (G.L. Miyake), respectively. They rate =2 on a scale of 0 to 5 for northern leaf spot, caused by Bipolaris zeicola (G.L. Stout) Shoemaker (syn. Helminthosporium maydis Nisikado & Tsuchiya). They are resistant to gray leaf spot caused by Cercospora zeae-maydis, Tehon & E.Y. Daniels.

Both PA759 and PA760 were selected from the second of the original four selections. These lines were evaluated extensively in small lots (50 kernels) from M.W. Johnson, Agronomy Department, 116 ASI Bldg., University Park, PA 16802.

PA860 is an AES800 maturity line that was developed by selfing and selection from the third cycle of half-sib selection in a synthetic population made up of genotypes with ≥50% WF99 lineage. The line was first evaluated in a topcross test as an S4, then in several three-way and single-cross combinations for yield, grain moisture, stalk strength, and disease reaction.

PA860 is similar in maturity to B73. Under normal growing conditions, it attains a plant height of ≈170 cm, with an ear height of 80 cm. The plants have a medium-size, semispinging, branched tassel, and medium-green leaves with a spreading type pattern. The medium-yellow kernels tend to be small, semiround with little or no denting, produced on a small ear (15 to 20 cm) of 14 to 16 rows on a red cob.

PA860 has been evaluated extensively in various combinations across several environments of Pennsylvania long-season areas (AES700 to AES900 maturity) since 1982. It combines well with Iowa stiff stalk derivatives, especially B73 relatives. It has good stalk strength per se and in crosses. In our tests it has had good resistance to northern leaf blight and to northern leaf spot, but only intermediate resistance to gray leaf spot caused by Cercospora zeae-maydis, Tehon & E.Y. Daniels.

Breeder seed of these lines is maintained by the Pennsylvania Agricultural Experiment Station and is available in small lots (50 kernels) from M.W. Johnson, Agronomy Department, 116 ASI Bldg., University Park, PA 16802.

M. W. JOHNSON* (1)

References and Notes


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REGISTRATION OF PA759 AND PA760 PARENTAL LINES OF MAIZE

PA759 (Reg. no. PL-160, PI 560074) and PA760 (Reg. no. PL-161, PI 560075) are inbred lines of yellow dent maize (Zea mays L.) developed at the Pennsylvania State University Agricultural Experiment Station. These two AES700-maturity related lines have had extensive evaluation and were released in 1989.

Both PA759 and PA760 were developed in a line improvement program involving many backcrosses. They originated from a cross between PA761 × H73 after six cycles of backcrossing and selection using PA761 as the recurrent male parent. Two plants were selected from the first backcross; from each of these, two were selected after the second backcross. One selection from each of these was carried through the sixth backcross. At that time, several plants from each of the four selections were crossed to two single-cross testers and evaluated in replicated tests. Both PA759 and PA760 were selected from the second of the original four selections. These lines were evaluated extensively for yield, standability, maturity, and disease reaction in various single cross combinations from 1983 to 1990.

Days from planting to midsilk for both lines are similar to that of H95, but both lines dry down more rapidly after physiological maturity. Under good growing conditions, they attain a plant height of 180 to 200 cm, with an ear height of about 90 to 100 cm. Both develop dark green, semispinging leaves and a semierect, medium-size, reddish tassel with 6 to 8 branches. They produce an ear 25 to 30 cm in length, with 14 to 16 rows of medium size, flat, yellow kernels with reddish tinges and a light colored cap on a red cob. Stalk and root strength of both lines per se and in crosses are good.

The related cross of PA759 × PA760 is more vigorous than either inbred and can be used as a seed parent to produce a modified single cross. Both lines combine well with derivatives of Iowa Stiff Stalk, C103, and OH43 of varying maturities.

In our tests, PA759 and PA760 have shown average or above-average resistance to northern and southern leaf blights, caused by Exserohilum turcicum (Pass.) K.J. Leonard & E.G. Suggs and Bipolaris maydis (Nisikado & Miyake) Shoemaker (syn. Helminthosporium maydis Nisikado & Miyake), respectively. They rate =2 on a scale of 0 to 5 for northern leaf spot, caused by Bipolaris zeicola (G.L. Stout) Shoemaker.