of backcrossing to the recurrent parent. In each line, the white inbred was produced by selfing the ninth backcross and selecting only white kernels.

Plants of SD54, whose recurrent parent is ND247, are ~120 cm tall, with ear placement ~55 cm above the ground. Tassels are small, and ears have white cobs. Ears are ~14 cm long and are borne on 4-cm shanks. There are 12 rows of flinty kernels. The line has good root, stalk strength, ear fill, and husk looseness. SD54 is AES200 maturity.

Plants of SD56, whose recurrent parent is ND250, are ~127 cm tall, with ear placement ~45 cm above the ground. Tassels are medium in size, and ears have white cobs. Ears, 12 cm long, are borne on 7-cm shanks with 14 rows of dent kernels. The line has good root and stalk strength, as well as strong vigor, good ear fill, and loose husks. SD56 is AES200 maturity.

Plants of SD57, whose recurrent parent is ND251, are ~81 cm tall, with ear placement ~40 cm above the ground. Tassels are medium in size. Ears, 12 cm long, are borne on 7-cm shanks. There are 14 rows of flinty kernels on a red cob. The line has good root and stalk strength, as well as good ear fill and loose husks. SD57 has less than optimum vigor. SD57 is AES200 maturity.

Plants of SD60, whose recurrent parent is W64A, are ~104 cm tall, with ear placement at ~48 cm above the ground. Tassels are medium in size. Ears are ~12 cm long and are borne on 7-cm shanks. There are 16 rows of flinty kernels on a light red cob. The line has good root and stalk strength, as well as strong vigor and loose husks. The ear fill is excellent. SD60 is AES400 maturity.

Plants of SD63, whose recurrent parent is CM105, are ~120 cm tall, with ear placement ~45 cm above the ground. Tassels are medium sized, and ears have 14 rows of flinty kernels on a white cob. Ears are ~17 cm long and are borne on 10-cm shanks. The line has good root and stalk strength, as well as excellent vigor and loose husks. SD63 has less than optimum ear fill. SD63 is AES300 maturity.

Plants of SD65, whose recurrent parent is A654, are ~125 cm tall. Tassels are small, and ears have white cobs. Ears, which are located ~50 cm above the ground, are 18 cm long and are borne on 10-cm shanks. There are 14 rows of flinty kernels. The line has good root and stalk strength, vigor, and ear fill, as well as loose husks. SD65 is AES300 maturity.

Plants of SD69, whose recurrent parent is A665, are ~112 cm tall, with ear placement ~48 cm above the ground. Tassels are medium in size, and ears have red cobs. Ears, 15 cm long, are borne on 6-cm shanks and have 14 rows of dent kernels. The line has good root and stalk strength, as well as good ear fill and vigor, and loose husks. SD69 is AES400 maturity.

All inbreds described above were tested in hybrid combinations at three locations in the summers of 1985, 1986, 1987, and 1988. SD54 yielded well with SD53 (9.4 Mg ha⁻¹) and SD63 (7.3 Mg ha⁻¹). SD56 performed well in combination with SD57 (7.6 Mg ha⁻¹) and SD59 (8.5 Mg ha⁻¹). SD57 produced high-yielding hybrids with SD56 (7.6 Mg ha⁻¹) and SD65 (7.7 Mg ha⁻¹). SD60 performed best in combinations with SD63 (9.0 Mg ha⁻¹), SD64 (9.1 Mg ha⁻¹), and SD65 (9.5 Mg ha⁻¹). SD63 performed well with SD54 (7.3 Mg ha⁻¹), SD59 (7.4 Mg ha⁻¹), and SD60 (9.0 Mg ha⁻¹). SD65 had high yields with SD57 (7.7 Mg ha⁻¹), SD60 (9.5 Mg ha⁻¹), and SD62 (8.7 Mg ha⁻¹). SD69 produced well in combination with SD62 (8.4 Mg ha⁻¹) and SD63 (8.3 Mg ha⁻¹). Checks included A632 × A619 (8.6 Mg ha⁻¹) and Pioneer-bred hybrid 390 (9.0 Mg ha⁻¹). Hybrids performed very consistently in 1985, 1986, and 1988. 1988 yields were significantly reduced because of drought. The LSD (0.05) for the combined trials was 0.95 Mg ha⁻¹. Because lines are of different maturities and breeding groups, data were not obtained using a common tester. Material tested was a mixture of equal amounts of reciprocal crosses. Some care should be used when comparing yields to general testers, because of differences in maturity. SD54, SD56, SD57, SD60, and SD65 are group A (Lancaster) lines, SD63 and SD69 are group B (Stiff Stalk) lines. Complete yield and quality data are available upon request.

Breeder seedstocks are maintained by South Dakota Foundation Seeds Stocks and can be obtained in germlasm quantities (50 kernels) from South Dakota State University Foundation Seed, Box 2125, Brookings, SD 57007.


References and Notes

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REGISTRATION OF SD50, SD53, SD55, SD59, AND SD73 PARENTAL LINES OF MAIZE

White dent inbred maize lines were developed at the Agricultural Experiment Station, South Dakota State University, Brookings: SD50 (Reg. no. PL-138; PI 538228), SD53 (Reg. no. PL-139; PI 538229), SD55 (Reg. no. PL-140; PI 538230), SD59 (Reg. no. PL-141; PI 538231), and SD73 (Reg. no. PL-142; PI 538232). These lines were evaluated for agronomic performance and in hybrid combination for yield and moisture. They were released, in March 1988, because of their potential to produce competitive hybrids in South Dakota.

These lines were developed by crossing each of several yellow dent inbred lines with SD316W, a white dent S.D. line, then backcrossing nine times. The yellow dent lines were the recurrent female parents. Because yellow kernels pollinated with pollen carrying the gene for white endosperm (a xenia effect) can be distinguished from kernels pollinated with pollen carrying the gene for yellow endosperm, those kernels carrying the white gene were identified in each cycle without selfing. Only those kernels identified as carrying the white allele were selected to be used as male in plants in the next cycle of backcrossing to the recurrent parent. In each line, the white dent inbred was produced by selfing the ninth backcross and selecting only white kernels.

Plants of SD50, whose recurrent parent is W153R, are ~60 cm tall with ear placement ~30 cm above the ground. Tassels are small, and ears have red cobs. Ears, ~20 cm long, are borne on 10-cm shanks and have 12 rows of flinty kernels. The line has good root and stalk length but has less than optimum vigor, ear fill, and husk looseness. SD50 is AES300 maturity.

Plants of SD53, whose recurrent parent is A632, are ~168 cm tall with ear placement ~100 cm above the ground. Tassels are medium in size. Ears, ~40 cm long, are borne on 14-cm shanks. There are 14 rows of dent kernels on a white cob. The line has good root and stalk strength, as well as strong vigor, good ear fill, and loose husks. SD53 is AES300 maturity.

Plants of SD55, whose recurrent parent is ND248, are ~120 cm tall, with ear placement ~60 cm above the ground. Tassels are medium in size, and ears have red cobs. Ears about ~30 cm long and are borne on 13-cm shanks. There