REGISTRATION OF GERMPLASM

Registration of 12 Glandless Cotton Germplasm Lines with Improved Fiber Strength:
TX-8702gl to TX-8713gl

Twelve germplasm lines of cotton (Gossypium hirsutum L.), designated TX-8702gl through TX-8713gl (Reg. no. GP-607 to GP-618, PI 584530 to PI 584541), were released by the Texas Agricultural Experiment Station (TAES) in August 1994. These lines combine increased fiber strength with the glandless seed and plant phenotype (i.e., glg2glg3). Fiber strength of the lines averaged 38.9 kN m kg⁻¹ (or 16%) higher than ‘Paymaster 145’, which was released by Cargill Hybrid Seeds for production on the Texas High Plains. Boll size in these lines ranged from 4 to 24% larger than Paymaster 145. All the lines except TX-8708gl displayed longer fiber than Paymaster 145; all had lower lint yields (4-33%) and lint percentages (0.3-3.6%).

TX-8702gl is an individual plant selection from an F₅ population following a cross of ‘Gregg XL-35’ and Dunn 11LG. Gregg XL-35 is an obsolete glandless cultivar developed by Gregg Seed Farms; Dunn 11LG is a glandless line developed by Dunn Seed Farms, Inc. TX-8702gl had bolls 20% larger and fiber 3% longer and 11% stronger than Paymaster 145.

TX-8703gl is an individual plant selection from an F₅ population of a cross between Gregg XL-35 and ‘CHI-411’. CHI-411 was an F₁ hybrid from Cotton Hybrids, Inc. TX-8703gl compared favorably with Paymaster 145 in boll size (+20%), fiber length (+2%), strength (+16%), and micronaire (+0.2 units).

TX-8704gl and TX-8707gl are single plant selections from F₅ bulk populations derived after crossing Gregg XL-35 with CA-1786-76B. CA-1786-76B is a glandless line released in 1976 by the Texas Agric. Exp. Stn. at Lubbock. It resulted from a series of complex crosses involving “Stormrider”, “Stonewall Smoothleaf”, an early maturing line designated C.B. 3051 (Yugoslav), a nectarless line, and ‘Del Cerro’. TX-8704gl produced the strongest fiber among these lines. Fiber strength of TX-8704gl and TX-8707gl exceeded that of Paymaster 145 by 22 and 19%, respectively; however, lint yield in the two lines was reduced 33 and 25%, respectively. Boll size in each was 16 and 20% higher, respectively; fiber length was 6% higher in both.

TX-8705gl and TX-8713gl are individual plant selections from F₅ and F₄ populations, respectively, following a cross between Gregg XL-35 and CA-2150-76B. CA-2150-76B is a glandless line derived from a cross between CA-1786 and CA-1073 and released in 1976 by the TAES at Lubbock. CA-1073 was the result of a complex series of crosses involving several strains tolerant of verticillium wilt (caused by Verticillium dahliae Kleb.). Fiber strength of both lines averaged 38.9 kN m kg⁻¹ (or 16%) higher than Paymaster 145, and the largest bolls (+24%) of TX-8706gl exceeded that of Paymaster 145 by 22 and 19%, respectively; however, lint yield in the two lines was reduced 33 and 25%, respectively. Boll size in each was 16 and 20% higher, respectively; fiber length was 6% higher in both.

TX-8706gl is a single plant selection from F₄ derived from a cross between ‘Paymaster 784’ and ‘CHI-411’. This line has the highest lint yield (only 4% less than Paymaster 145) and the largest bolls (+24%) of any in the group. It has a relatively high micronaire value (+0.2 units) and has 0.5% more elongation (+0.9%) compared with Paymaster 145; 4% longer and 5% stronger than the check.

TX-8708gl and TX-8709gl are F₄ individual plant selections derived from a cross of Dunn 11LG and ‘Paymaster 145’. TX-8708gl had the highest fiber elongation percent (+2%) compared with Paymaster 145 (4% longer) in the group. F₄ TX-8709gl resulted from the same cross of Dunn 11LG and ‘Paymaster 145’. TX-8709gl displayed 16% longer fiber, 11% higher micronaire units than the check. It exhibited shorter length (-3%) than the check. As expected with the shortest fiber, it displayed the highest uniformity ratio (+2%). TX-8709gl had the smallest bolls in the group (+2%) and the lowest micronaire (-0.5 units) of any fiber.

TX-8710gl resulted from an F₂ individual plant selection derived from a three-way cross of Gregg XL-35/Dunn 14LG/EPSM 4A-1-2 line exhibited high fiber strength; it came from Source Material (EPSM) developed by P.J. Lyerly. TX-8710gl was the longest fiber in this group of lines. Its fiber was 17% stronger than Paymaster 145, and its bolls were 12% larger.

TX-8711gl was derived from an F₂ plant selection of a cross Gregg XL-35/CA-2150-76B/CA-1786-76B/TX-GN-80. Its fiber was 5% longer, 11% stronger, and had 0.5% more micronaire units than Paymaster 145; its bolls were 12% larger.

TX-8712gl is an individual plant selection of a glandless line designated NM1499 acquired from New Mexico State University. This line had 14% larger bolls and 13% stronger fiber than Paymaster 145.

Small quantities of seed (25 g) may be obtained from the corresponding author until seed supplies are exhausted.

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References and Notes

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