REGISTRATION OF PARENTAL LINES

Registration of B411, B416, and B418
Parental Lines of Cotton

Three parental restorer lines of cotton (*Gossypium hirsutum* L.), B411 (Reg. no. PL-12, PI 583851), B416 (Reg. no. PL-13, PI 583852), and B418 (Reg. no. PL-14, PI 583853) were released jointly by the USDA-ARS and the Texas Agricultural Experiment Station in 1994. B411, B416, and B418 possess a strong fertility-restorer gene that should be useful in producing hybrid cottonseed using the *G. harknessii* Brandegee cytoplasmic male sterility. Because of the high fertility restoration in all F1 hybrids produced from B411, B416, and B418, we surmise that these lines may also possess the fertility enhancer factor described by Sheetz and Weaver (4). The three lines are glabrous, a trait which reduces fiber trash content and imparts some resistance to the bollworm (*Helicoverpa zea* (Boddie)), tobacco budworm (*Helicoverpa virescens* (F.); syn *Heliothis virescens*), and sweetpotato whitefly (*Bemisia tabaci* (Genn.)). That glabrousness has exhibited near-complete dominance in F1 hybrids. The three lines are early in maturity and highly resistant to *Xanthomonas campestris* pv. *malvacearum* (Smith) Dye, the bacterial blight pathogen.

The restorer lines B411, B416, and B418 (also tested as 8RA4-A6-314-4, 8RA4-A6-314-6, and 8RA4-A6-314-6-1, respectively) were derived from a cross between 8RA4, a fertility-restoring male parent, and A6 BC1, a cytoplasmic male-sterile female parent. 8RA4 resulted from an individual plant selection in a fertility-restoration breeding line (provided by L.L. Ray, then of the Texas Agric. Exp. Stn., Lubbock) on the ‘Tamcot 788’ (3) genetic background. The resulting selection, designated 506-2-87, was then subjected to the multi-adversity resistance (MAR) selection process (2). Two plants were selected by this procedure, bulked, and designated as 8RA4. A6 BC1 was developed from a cross and subsequent backcross of BLLCABS-3-86 (a glabrous line developed by L.S. Bird and K.M. El-Zik, Texas Agric. Exp. Stn., College Station) with a ‘Tamcot CAMD-E’ (1) male-sterile line (received from R.F. Holland, then of DeKalb-Pfizer Genetics, Axtell, TX).

After intentionally crossing 8RA4 and A6 BC1, five individual plant selections for abundant pollen production were made in the F2. Subsequent individual plant selections for abundant pollen production from the F3 progeny row number 314 led to lines B411 and B416. Restorer line B418 was derived from a plant selection in the greenhouse for increased pollen production from the F4 of B416. The F5 progeny rows of B411 and B418 were rogued for offtypes, and test crosses with male-sterile lines to confirm fertility restoration. Throughout line development, plants were self pollinated to prevent contamination.

In three tests conducted at Weslaco, TX, in 1992-1993, hybrids derived using these three lines exhibited complete fertility, seedling cold tolerance, seedling vigor, lint yield, lint percentage; and were earlier in flowering compared with ‘Deltapine 50’ and ‘Stoneville 132’. Fiber strength ranged from 256.0 to 263.9 kN m kg⁻¹, 2.5% span fiber length from 26.7 to 27.7 mm, elongation from 7.7 to 9.1%, E₂ elongation of 4.3 to 4.5 units, compared with Deltapine 50 with fiber strength of 246.2 kN m kg⁻¹, 2.5% span fiber length of 27.7 mm, E₂ elongation of 8.4%, and micronaire of 4.8 units.

These parental lines provide breeders with characteristics capable of producing hybrids with potential, fiber quality, seedling cold tolerance, and resistance to several biotic stresses. Limited quantities of seed are available for distribution upon written request to the corresponding author. Appropriate recognition is requested when these lines contribute to the development of a new cultivar or hybrid.

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References and Notes


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