Registration of 14 Primitive Derived Cotton Germplasm Lines with Improved Fiber Strength

The ARS-USDA and the Mississippi Agricultural and Forestry Experiment Station released 14 primitive derived cotton (*Gossypium hirsutum* L.) germplasm lines (Reg. no. GP-822 through GP-835, PI 639148 through PI 639161) with improved fiber strength in 2004. These lines were derived from photo-periodic primitive race accessions that were converted to day-neutrality and selected for improved fiber strength. The germplasm release designation, registration number, and PI number of each line are given in Table 1.

The procedure for developing the germplasm lines is briefly described. Detailed information on their development and evaluation was reported by McCarty et al. (2003, 2004a, 2004b). The lines were derived from day-neutral selections from crosses of cultivars with day-length sensitive primitive race accessions (Percival, 1987). Crosses were made, the F₁ generation was self-pollinated at the Cotton Winter Nursery, Tecoman, Colima, Mexico, and the F₂ generation was grown in the field at Mississippi State, MS.

M75–1 was developed from a cross between ‘Deltapine 16’ (PI 529251, DPL16) and the primitive accession T75 (PI 549138) where day-neutral flowering habit was selected in the F₂. This day-neutral selection was then backcrossed to T75. A single high fiber strength day-neutral plant was selected in the BC₁F₂. A single high strength plant was selected in the two succeeding generations.

M1388–1, M1388–2, and M1388–3 were developed from a cross between ‘DESS66’ (PI 529520) (Bridge and Chism, 1978) and accession T1388 (PI 415112). A high fiber strength, day-neutral plant was selected in the F₂ and F₃. Three high strength plants were selected in the F₄ from which M1388–1, M1388–2, and M1388–3 were derived.

M239–1 through M239–7 was developed from a cross between DPL16 and accession T239 (PI 163693) where day-neutral flowering habit was selected in the F₂. This day-neutral selection was then backcrossed three times to T239, each time selecting for the day-neutral flowering habit in the F₂ following each backcross. A high strength day-neutral plant was selected in the BC₃F₂. In the BC₃F₃, three high strength plants were selected. From progeny of these three plants, seven selections were made in the BC₄F₄ from which M239–1 through M239–7 were derived.

M237–1, M237–2, and M237–3 were developed from a cross between DPL16 and accession T237 (PI 163657) where day-neutral flowering habit was selected in the F₂. This day-neutral selection was then backcrossed to T237, two BC₁F₂, day-neutral, plants were selected for superior fiber length and strength. From these two plants, three BC₁F₃ plants were selected and from their progeny, three BC₄F₄ plants were selected from which M237–1, M237–2, and M237–3 were derived.

The F₁-derived plant selections of all crosses were advanced to the F₄ via bulk-self increase. The F₅ generation was evaluated. The strength for the germplasm lines day-neutral selection was then backcrossed to T75. A single high strength day-neutral plant was selected in the BC₁F₂. M239–7. These lines represent diverse germplasm... high strength germplasm, parental line, or genetic stock. From progeny of these three plants, seven selections were made in the BC₄F₄ from which M239–1 through M239–7 were derived.

Small quantities of seed of these germplasm lines are obtained from the corresponding author. Registries are asked to make appropriate recognition of the germplasm if it is used in the development of germplasm, parental line, or genetic stock.

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References


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