Registration of Seven Pubescent Multi-Adversity Resistant (MAR-6) Germplasm Lines of Upland Cotton

Seven pubescent multi-adversity resistant (MAR) germplasm lines of upland cotton (*Gossypium hirsutum* L.) from the MAR-6 germplasm pool were released by the Texas Agricultural Experiment Station (TAES) in April 1997. These lines, designated as CAHUGARPIH-1-88 (Reg. no. GP-672, PI 602998), CD3HHCABCUH-1-88 (Reg. no. GP-673, PI 602999), CD3HCAHUGH-2-88 (Reg. no. GP-674, PI 603000), CD3HCHULBH-1-88 (Reg. no. GP-675, PI 603001), CAB3CABCH-1-89 (Reg. no. GP-676, PI 603002), CD3HCABCUH-1-89 (Reg. no. GP-677, PI 603003), and LBBCDOAKH-1-90 (Reg. no. GP-678, PI 603004), were developed by the TAES-MAR Cotton Genetic Improvement Program using specific seed, seedling, and plant selection procedures and techniques to develop cotton with higher levels of resistance to pests (insects and plant pathogens) and abiotic stresses. In addition, selections are made for increased yield potential, earliness, and fiber and seed quality traits.

Performance evaluations were conducted over 2 to 3 yr in eight nurseries in Texas (8) to determine levels of resistance to adversities (insects, plant pathogens, and drought). In addition, the lines were tested at two locations in the Coastal Bend region of Texas. Levels of resistance to pests were determined in comparisons with cotton lines and cultivars having known levels of resistance and susceptibility to those pests. The lines also were compared with ‘Tamcot CAB-CS’ (2), ‘Tamcot HQ95’ (5), and ‘Tamcot Sphinx’ (6) for lint yield, earliness, boll size, gin turnout, lint percentage, and fiber quality traits.

These pubescent lines have similar levels of resistance to insects and pathogens as the MAR-6 glabrous germplasm (8) and significantly higher levels of broad-spectrum resistance to six insects and eight pathogens than the earlier-released MAR germplasm (7). All seven lines are highly resistant to the bacterial blight pathogen [*Xanthomonas campestris* pv. *malvacearum* (Smith) Dye]. All are glanded and nectaried, and have normal bract and leaf types.

CAHUGARPIH-1-88 originated from a cross between CAHUGS-1-84 and a line from Argentina, Pora Inta (ARPIH-2-84). This line is very pubescent, has the *B₁B₂B₇* genes for bacterial blight resistance, and displays a standability similar to Tamcot Sphinx. CAHUGARPIH-1-88 is later maturing than the Tamcot cultivars and has excellent fiber quality. Fiber strength is 40.2 kN m kg⁻¹ stronger than Tamcot CAB-CS and 28.4 kN m kg⁻¹ stronger than Tamcot HQ95. Fiber uniformity and fineness (micronaire reading) are significantly greater than those of Tamcot CAB-CS and Tamcot HQ95.

CD3HHCABCUH-1-88 was developed from a cross between CDP37HH-1-85 [a selection from ‘Tamcot CD3H’ (3)] and a line from Argentina, Chaco Inta (ARCI-1-84). This line has the *B₁B₂B₉B₇* genes for bacterial blight resistance, and fiber strength averages 296.3 kN m kg⁻¹. It has improved levels for resistance to phymatotrichium root rot (caused by *Phymatotrichum omnivorum* (2)). CD3HHCABCUH-1-88 is later maturing than Tamcot CAB-CS and Tamcot HQ95. It is a very pubescent line, 11.2% earlier than Tamcot CAB-CS and Tamcot HQ95.

CD3HCAHUGH-2-88 was developed from the cross CD3H × CHULBH-1-85. It has the *B₂B₇B₉B₇* genes for bacterial blight resistance, and improved levels for resistance to pathogens causing phymatotrichium root rot, verticillium wilt (*Verticillium dahliae* Kleb.), and the fusarium wilt-root-knot nematode complex. Fiber strength averages 266.8 kN m kg⁻¹ and earliness of CD3HCHULBH-1-88 are similar to Tamcot HQ95.

CABCD3CAB-1-89 was developed from cross CABUCCD3-1-86 [later released as Tamcot CAB-CS] and Tamcot CAB-CS. It has the *B₂B₇B₉B₇* genes for bacterial blight resistance and an average fiber strength of 274.7 kN m kg⁻¹. This line produced lint yield similar to the Tamcot cultivars and has a stronger fiber than Tamcot CAB-CS and Tamcot HQ95.

CD3HCABCUH-1-89 was developed from the cross CDP37HH-1-85 × CABCHUH-1-86. It has improved levels of resistance to phymatotrichium root rot and verticillium wilt, has the *B₂B₇B₉B₇* genes for bacterial blight resistance, is similar to Tamcot HQ95, but the line is later in maturity and has a longer fiber than the Tamcot cultivars.

LBBCDOAKH-1-90 is a very pubescent type from a cross between LBBCDOAKH-1-87 (MAR-5 release [7]) and a line from Central Africa, BOUAK 86-87. It has the *B₂B₇B₉B₇* genes for bacterial blight resistance. LBBCDOAKH-1-90 has a high yield potential and fiber quality averages 29.2 mm, and fiber strength averages 215 kN m kg⁻¹. It is later in maturity than Tamcot CAB-CS and Tamcot HQ95.

These lines should be useful to commercial cotton breeders in the development of pubescent cultivars with broad and high levels of resistance to insects and pathogens, and high yield and fiber quality. Small quantities of seed lines are available for distribution upon written request to the corresponding author.

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References and Notes