Registration of Arkot 9203–03 and Arkot 9203–17 Germplasm Lines of Cotton

Two breeding lines of cotton (Gossypium hirsutum L.) designated as Arkot 9203–03 (Reg. no. GP-853, PI 641157) and Arkot 9203–17 (Reg. no. GP-854, PI 641158) were released in 2005 by the Arkansas Agricultural Experiment Station. Arkot 9203–03 (tested as 9203–03–20) and Arkot 9203–17 (tested as 9203–17–12) were developed using the generalized procedures outlined by Bourland (2004).

The two sister lines were derived from a 1992 cross between ‘H-1330’ (Bourland, 1996) and ‘Delcot 344’ (Sappenfield, 1987). Within F2 populations grown at the Southeast Branch Station at Rohwer, AR, in 1993, bolls from visually superior individual plants were harvested and bulked. Plants derived from F3 seeds were selected using modified procedures of Bird (1982) to produce seeds for F4 progeny rows grown in 1995. Progenies designated as 9203–03 and 9203–17 were among the ones promoted and tested in replicated strain tests in 1996 and 1997. Individual plant selections from the F6 generation of these two strains (designated as 9203–03–20 and 9203–17–12) were evaluated as progenies in 1998 and 1999, then as strains in 2001 to 2004.

The two lines were included in 18 replicated field tests at four Arkansas Agricultural Research Station sites in the Mississippi River Delta and compared to ‘SG 747’ in 2001, ‘SG 105’ in 2002 to 2003, and ‘DP 444 BG/RR’ in 2004. Averaged across all tests, lint yield of Arkot 9203–03 was 10% greater than the check cultivars, and was significantly higher than the check cultivars in 9 of the 18 tests. Seed and lint indices for Arkot 9203–03 were similar to the check cultivars. The higher yields for Arkot 9203–03 were associated with producing more seed per area than the check cultivars. Yields of Arkot 9203–17 were essentially equal to the check cultivars in the 18 Arkansas tests, but exceeded ‘SG105’ and Arkot 9203–03 in tests at Tifton, GA, in 2002 and 2003.

Compared to the check cultivars, fibers of Arkot 9203–03 and Arkot 9203–17 tended to be finer (5% lower micronaire readings) and stronger (6 and 12% higher strength, respectively), but had lower elongation (8 and 12% less, respectively) than the check cultivars. Fibers of Arkot 9203–17 were 2% longer than the check cultivars and Arkot 9203–03.

Arkot 9203–03 and Arkot 9203–17 were 11 and 6% taller than the check cultivars, respectively. Although taller than the check cultivars, open boll ratings in 2003 and 2004 indicated that maturity of the lines did not differ from check cultivars. Measured over six tests, leaf pubescence of Arkot 9203–03 and Arkot 9203–17 averaged 4.4 based on a rating scale of 1 (smooth leaf) to 7 (very hairy) (Bourland et al., 2003).

Both lines display good host plant resistance traits. During selection, both lines were screened for resistance to races 1, 2, 7, and 18 of Xanthomonas campestris pv. malvacearum (Smith) Dye, the causal agent of bacterial blight. Resistance to these races conveys resistance to all known U.S. races of this pathogen. In subsequent tests, neither line exhibited symptoms of bacterial blight even after field inoculations with Xanthomonas campestris pv. dahliae. Wilted plants associated with Verticillium wilt (caused by Verticillium dahliae Kleb.) of both lines exceeded controls in a 2002 field test, but were equal to DP 444BR/RR in a 2004 National Cotton Fusarium Wilt Test. Resistance levels of both Arkot 9203–03 and Arkot 9203–17 to Fusarium wilt [caused by Fusarium oxysporum f. sp. vasinfectum (Atk.) Snyder & Hans.] were significantly higher than the resistant check, M-315 (Glass et al., 2004). In addition, both lines were more resistant to tarnished plant bug (Lygus hesperus (Palisot de Beauvois)) than the susceptible check, SG 105.

Arkot 9203–03 had the second highest yield in the 2003 Regional Breeders’ Net Test, but yielded to ‘SG105’ in 2002 to 2003, and ‘DP 444 BG/RR’ in 2004. Averaged across all tests, lint yield of Arkot 9203–03 was 10% greater than the check cultivars, and was significantly higher than the check cultivars in 9 of the 18 tests. Seed and lint indices for Arkot 9203–03 were similar to the check cultivars. The higher yields for Arkot 9203–03 were associated with producing more seed per area than the check cultivars. Yields of Arkot 9203–17 were essentially equal to the check cultivars in the 18 Arkansas tests, but exceeded ‘SG105’ and Arkot 9203–03 in tests at Tifton, GA, in 2002 and 2003. Compared to the check cultivars, fibers of Arkot 9203–03 and Arkot 9203–17 tended to be finer (5% lower micronaire readings) and stronger (6 and 12% higher strength, respectively), but had lower elongation (8 and 12% less, respectively) than the check cultivars. Fibers of Arkot 9203–17 were 2% longer than the check cultivars and Arkot 9203–03.

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