Registration of Arkot 9315 and Arkot 9409
Germplasm Lines of Cotton

Two breeding lines of cotton, *Gossypium hirsutum* L., designated Arkot 9315 (Reg. no. GP-866, PI 641707) and Arkot 9409 (Reg. no. GP-867, PI 641708) were released by the Arkansas Agricultural Experiment Station in 2005. The combinations of yield adaptation, early maturation, and specific host plant resistance traits of these lines make the lines valuable to cotton breeding programs.

Both Arkot 9315 and Arkot 9409 were developed using the generalized procedures outlined by Bourland (2004). Both lines were derived from crosses of a common parent, Arkot 8606 (Bourland and Benson, 2002), and with SG39 in case of Arkot 9315 and 'SG125' in case of Arkot 9409. SG 39 was derived by direct selection from SG 125.

Within F2 populations grown at Southeast Branch Station at Rohwer, AR, in 1995 (for Arkot 9315) and 1996 (for Arkot 9409), bolls from visually superior individual plants were harvested and bulked. Selected plants from the bulk F3 populations were harvested individually to produce F4 progeny rows grown replicated tests in 1998 and 1999 were lines 9315-33 and 9409-21. Individual plant selections from the F6 generation of 9315-33 were evaluated as progenies in 1999 and 2000; one of these produced Arkot 9315 (tested as 9315-33-21). Similarly, individual plant selections from the F6 generation of 9409-21 were evaluated as progenies in 2000; one of these selections produced Arkot 9409 (tested as 9409-40-08).

From 2001 through 2004, the two lines were compared with 'SG 105' and 'PSC 355' in 10 replicated field tests at four Arkansas Agricultural Research Station sites, in two tests at an off-station site in northeast Arkansas, in three tests at Tifton, GA, and in two tests at Leland, MS. Mean lint yields of the lines over all Arkansas tests were similar to check cultivars. Lint yields of Arkot 9315 were significantly higher than SG 105 in four of the 14 tests, while yields of Arkot 9409 were significantly less than SG 105 in four of the 14 tests. Comparing the two lines, Arkot 9409 yielded relatively better at Clarkdale and Mariana, while Arkot 9315 produced higher yields at all other Arkansas locations. Both lines yielded significantly less than the check PSC 355 at Tifton, GA, in 2002 and Arkot 9409 yielded significantly less than either check at Tifton, GA, in 2004. Otherwise, yields of Arkot 9315 and Arkot 9409 were statistically equal to the two check cultivars in the five tests conducted in Georgia and Mississippi.

In Arkansas tests, basic yield components, i.e., lint index and number of seed per acre, of Arkot 9409 were similar to check cultivars. In contrast, yields of Arkot 9315 were derived from relatively fewer seed per acre and more lint per seed (lint index) than the check cultivars. According to Lewis et al. (2000), the combination of yield components associated with Arkot 9315 should contribute to more stable yield production. Seed size of Arkot 9315 tended to be about 10% larger than seed size of Arkot 9409 and the check cultivars. Lint percent-

Arkot 9315 and Arkot 9409 have been evaluated for resistance to diseases (bacterial blight, Fusarium wilt, and seedling disease) and to pests (tarnished plant bug). During selection, both lines were resistant to multiple races of *Xanthomonas campestris pv. malvacearum* (Smith) Dye, the causal agent of bacterial blight. Resistance to the multiple races conveys resistance to all known U.S. races of this pathogen. In subsequent tests, both lines exhibited symptoms of bacterial blight after inoculation with the pathogen. In 2002, Arkot 9315 had significantly less wilted plants associated with Verticillium wilt (caused by *Verticillium dahliae* Kleb.) than Arkot 9409 and PSC 355. However, Arkot 9409 had significantly more wilted plants in 2004 than Arkot 9315 and the two checks. Resistance to seedling disease (caused by *Fusarium solani* [Kühn]) than Arkot 9315 and the two checks, while Arkot 9315 displayed higher resistance than PSC 355. In 2004 greenhouse test, Arkot 9409 had significantly less wilted plants associated with Verticillium wilt (caused by *Verticillium dahliae* Kleb.) than Arkot 9315 and the two checks. In the three locations (Hartsville, SC, Mississippi State, MS, and Bossier City, LA), and in two tests at an off-station site in northeast Arkansas, in three tests at Tifton, GA, and in two tests at Leland, MS. Mean lint yields of the lines over all Arkansas tests were similar to check cultivars. Lint yields of Arkot 9315 were significantly higher than SG 105 in four of the 14 tests, while yields of Arkot 9409 were significantly less than SG 105 in four of the 14 tests. Comparing the two lines, Arkot 9409 yielded relatively better at Clarkdale and Mariana, while Arkot 9315 produced higher yields at all other Arkansas locations. Both lines yielded significantly less than the check PSC 355 at Tifton, GA, in 2002 and Arkot 9409 yielded significantly less than either check at Tifton, GA, in 2004. Otherwise, yields of Arkot 9315 and Arkot 9409 were statistically equal to the two check cultivars in the five tests conducted in Georgia and Mississippi.

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References


