NOTICE OF RELEASE OF ARKOT 8303 GERMPLASM LINE OF COTTON

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The Arkansas Agricultural Experiment Station and the Mississippi Agricultural and Forestry Experiment Station announce the release of a noncommercial breeding line of cotton, *Gossypium hirsutum* L., designated as Arkot 8303. Arkot 8303 possesses superior fiber quality and host plant resistant traits, and is particularly adapted to silty loam soils in the northern Mississippi River delta.

Arkot 8303 originated from a 1983 cross between Miscot 7801 and Miscot 7824 (Bourland and White, 1992), and was tested as 8303-54. Individual plant selections were made from the F_2 and F_3 populations in 1984 and 1985, respectively. Procedures of Bird (1982), modified to permit selection for lateral root development, were used to select from the bulked F_3 seed to produce a line designated as 8303-54.

Agronomic traits of Arkot 8303 were compared to 'DES 119' in 14 tests from 1987 through 1993 at experiment stations in Arkansas and Mississippi (Table 1). Over all tests, Arkot 8303 yielded significantly less than DES 119. but yields of the two genotypes were equal in nine tests on silty loam soils at Clarkedale and Marianna. Arkot 8303 averaged 16% less yield than DES 119 at Rohwer, Keiser, and two central Mississippi sites. Compared to DES 119, Arkot 8303 matured significantly earlier and had significantly longer and stronger fibers. Leaf pubescence of Arkot 8303 is less than DES 119, and is similar to 'Stoneville 132'.

Level of resistance to tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), displayed by Arkot 8303 was similar to DES 119 and other released cultivars and germplasm lines (Table 2). During its selection, Arkot 8303 was 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 the pathogen. In the Regional Cotton Fusarium Wilt Test at Tallassee, AL, resistance of Arkot 8303 to fusarium wilt [caused by *Fusarium oxysporum* f. sp. *vasinfectum* (Atk.) Synd. and Hans.] was equal to the resistant check in each of four years (Table 3). Averaged over the four years, wilted plants for Arkot 8303, the resistant check, and the susceptible check were 24, 31, and 83%, respectively.

Small quantities of Arkot 8303 seed may be obtained for breeding purposes from F.M. Bourland, Department of Agronomy, Plant Science 115, University of Arkansas, Fayetteville, AR 72701.

References

1. Bird, L.S. 1982. The MAR (Multi-Adversity Resistance) system for genetic improvement of cotton. Plant Dis. 66:172-176.

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3. Maredia, K.M., N.P. Tugwell, B.A. Waddle, and F.M. Bourland. 1994. Technique for screening cotton germplasm for resistance to tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois). Southwestern Entomologist 19:63-70.

Table 1. Yield and fiber properties of Arkot 8303 and DES 119 over 14 tests from 1987 through 1991.

					Fiber properties		
Genotype	Lint yield	First pick	Lint fraction	Micro-naire	Length	Strength	Elong-ation
Arkot 8303	961	82.7	37.5	4.34	1.16	28.3	8.7
DES 119	1046	79.7	37.6	4.41	1.12	26.8	9.0
LSD 0.05	47	1.2	ns	ns	0.01	1.3	ns
Pr. (GXE)	0.01	0.03	0.04	0.19	0.04	0.70	0.20

1/ Tests conducted at Stoneville, MS (1987), Mississippi State, MS (1987), Keiser, AR (2 tests in 1991), Clarkedale, AR (1988, 1989 1990, and 1991), Marianna, AR (1988, 1989, 1990, and 2 tests in 1991), and Rohwer, AR (1991).

Table 2. Plant bug damage[1] for Arkot 8303 and released germplasm lines and cultivars at Clarkedale, Arkansas in 1988.

Genotype	Anthers damaged	Squares damaged
	%	%
Arkot 8303	16	59
Miscot 8001	19	54
Miscot 8004	18	61
Miscot 8006	15	56
DES 119	12	42
Stoneville 506	21	52
LSD 0.05	10	21

1/ Plant bug damage was estimated by cutting 12 squares/plot in 2 replications, then examining anthers using method of Maredia et al. (1994). Damage was expressed as estimated average percentage of anthers discolored and as percentage of squares with any discolored anthers. Data were extracted from a test of 28 entries.

Table 3. Performance of Arkot 8303 in the Regional Fusarium Wilt Tests at Tallassee, AL.

	Wilted plants by year:			
Genotype	1988	1989	1990	1991
	%	%	%	%
Arkot 8303	23	21	24	30
Resistant check, McNair 235	8	36	-	-
Resistant check, S-35	-	-	36	-
Resistant check, Auburn 56	-	-	-	44
Susceptible check, Rowden	67	93	80	93
LSD 0.05	27	36	29	29

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