

**NOTICE OF RELEASE OF ARKOT 9202 AND ARKOT 9208 GERMPLASM LINES OF COTTON**

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The Arkansas Agricultural Experiment Station announces the release of two noncommercial breeding lines of cotton, *Gossypium hirsutum* L., designated Arkot 9202 and Arkot 9208. The lines were developed using the generalized procedures outlined by Bourland (2004). Both lines were derived from crosses made in 1992 with a common parent, the breeding line GA 88-166, obtained from Shelby Baker, University of Georgia at Athens, Coastal Plain Experiment Station, Tifton, GA. The second parents of Arkot 9202 and Arkot 9208 were 'H1330' (Bourland, 1996) and Ark 8603-05, respectively. Ark 8603-05 is a breeding line developed from a cross of Miscot 7853 (Bourland and White, 1989) and Miscot 7918 (Bourland et al., 1990).

Within F<sub>2</sub> populations grown at Southeast Branch Station at Rohwer, AR, in 1993, bolls from visually superior individual plants were harvested and bulked. Plants derived from F<sub>3</sub> seeds were selected using modified procedures of Bird (1982) to produce seeds for F<sub>4</sub> progeny rows grown in 1995. Progenies designated as 9202-24 and 9208-05 were among the ones promoted and tested in replicated strain tests in 1996 and 1997. Individual plant selections from the F<sub>6</sub> generation of these two strains were evaluated as progenies in 1998 and 1999. Two of these selections produced Arkot 9202 (tested as 9202-24-13) and Arkot 9208 (tested as 9208-05-01).

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 2002-2003, and 'DP 444 BG/RR' in 2004 (Tables 1 and 2). Mean lint yields of the lines over all tests were similar to check cultivars, but lint yields of Arkot 9202 and Arkot 9208 were significantly higher than yields of the check cultivars in five and three of the 18 tests, respectively. Arkot 9202 tended to yield relatively better in north Arkansas locations while Arkot 9208 tended to yield better in south Arkansas sites. Yields of both lines were comparable to SG 105 in tests at Tifton, GA, in 2002 and 2003 (Table 3).

<b>Years</b>	<b>Loc<sup>1</sup></b>	<b>Line/- significance<sup>2</sup></b>	<b>Lint yield</b>	<b>Lint fract</b>	<b>Plant ht</b>	<b>Micro- naire</b>	<b>Len- gth</b>	<b>Unif. index</b>	<b>Stren- gth</b>	<b>Elon- gation</b>
			<b>lb/a</b>	<b>%</b>	<b>cm</b>		<b>in.</b>	<b>%</b>	<b>g/tex</b>	<b>%</b>
03	Man	9202-24-13	1014	40.7	85	4.6	1.15	82.3	31.3	8.5
03	Man	<i>H,E,L</i>	<i>1,0,0</i>	<i>0,1,0</i>	<i>1,0,0</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>
03	Man	9208-05-01	831	36.2	85	3.8	1.13	82.3	32.8	8.9
03	Man	<i>H,E,L</i>	<i>0,1,0</i>	<i>0,0,1</i>	<i>0,1,0</i>	<i>0,0,1</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>
03	Man	sl check	917	41.0	78	4.4	1.15	83.8	29.8	8.2
01-04	K-ir	9202-24-13	1150	40.4	108	4.1	1.17	84.8	29.8	7.2
01-04	K-ir	<i>H,E,L</i>	<i>3,2,0</i>	<i>1,4,0</i>	<i>1,3,0</i>	<i>1,0,4</i>	<i>2,1,2</i>	<i>0,4,1</i>	<i>0,5,0</i>	<i>0,2,3</i>
01-04	K-ir	9208-05-01	1024	38.8	101	4.8	1.22	85.8	31.7	8.0
01-04	K-ir	<i>H,E,L</i>	<i>1,4,0</i>	<i>0,4,1</i>	<i>0,4,0</i>	<i>2,3,0</i>	<i>4,1,0</i>	<i>0,4,1</i>	<i>4,1,0</i>	<i>0,5,0</i>
01-04	K-ir	sl check	1087	39.1	100	4.6	1.17	85.9	29.9	7.9
01,02,04	C-ir	9202-24-13	1111	40.3	133	3.9	1.17	84.5	29.6	6.5
01,02,04	C-ir	<i>H,E,L</i>	<i>1,2,0</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>0,1,2</i>	<i>0,3,0</i>	<i>0,2,1</i>	<i>0,3,0</i>	<i>0,1,2</i>
01,02,04	C-ir	9208-05-01	1089	38.0	123	4.4	1.19	85.4	31.0	7.4
01,02,04	C-ir	<i>H,E,L</i>	<i>0,2,1</i>	<i>0,2,1</i>	<i>0,2,1</i>	<i>2,1,0</i>	<i>2,1,0</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>1,2,0</i>
01,02,04	C-ir	sl check	1240	39.9	125	4.0	1.17	85.2	29.9	7.0

01-04	M-ir	9202-24-13	910	41.2	115	4.3	1.17	84.5	29.9	7.1
01-04	M-ir	<i>H,E,L</i>	<i>0,6,0</i>	<i>1,5,0</i>	<i>1,4,0</i>	<i>0,6,0</i>	<i>2,4,0</i>	<i>0,6,0</i>	<i>1,4,1</i>	<i>0,2,4</i>
01-04	M-ir	9208-05-01	961	37.8	111	4.5	1.21	85.6	32.0	7.9
01-04	M-ir	<i>H,E,L</i>	<i>1,5,0</i>	<i>0,6,0</i>	<i>1,4,0</i>	<i>2,4,0</i>	<i>5,1,0</i>	<i>1,5,0</i>	<i>2,4,0</i>	<i>1,5,0</i>
01-04	M-ir	sl check	940	39.4	109	4.5	1.15	84.6	31.3	7.9
02-04	R-ir	9202-24-13	1445	41.5	119	4.4	1.16	84.4	30.7	6.4
02-04	R-ir	<i>H,E,L</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>2,1,0</i>	<i>0,2,1</i>	<i>0,3,0</i>	<i>0,3,0</i>	<i>0,3,0</i>	<i>0,0,3</i>
02-04	R-ir	9208-05-01	1502	39.2	119	4.7	1.22	85.3	31.7	6.9
02-04	R-ir	<i>H,E,L</i>	<i>0,3,0</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>1,2,0</i>	<i>3,0,0</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>0,2,1</i>
02-04	R-ir	sl check	1293	39.0	109	4.7	1.16	85.1	30.5	7.1
01-04	All	9202-24-13	1059	40.4	113	4.1	1.17	84.3	29.9	6.8
01-04	All	<i>H,E,L</i>	<i>5,13,0</i>	<i>3,15,0</i>	<i>6,10,0</i>	<i>1,10,7</i>	<i>4,12,2</i>	<i>0,16,2</i>	<i>1,16,1</i>	<i>0,6,12</i>
01-04	All	9208-05-01	1058	37.8	109	4.5	1.20	85.3	31.5	7.6
01-04	All	<i>H,E,L</i>	<i>3,15,0</i>	<i>0,15,3</i>	<i>2,13,1</i>	<i>7,10,1</i>	<i>14,4,0</i>	<i>1,16,1</i>	<i>8,10,0</i>	<i>2,15,1</i>
01-04	All	sl check	1055	38.9	105	4.4	1.17	85.2	29.9	7.5

<sup>1</sup>Locations included irrigated tests at Manila (Man), Keiser (K-ir), Clarkedale (C-ir), Marianna (M-ir) and Rohwer (R-ir) plus non-irrigated tests at Keiser (K-ni) and Marianna (M-ni).

<sup>2</sup>H,E,L = no. of tests that line was significantly higher (H), equal to (E) and lower (L) than check cultivars.

<b>Table 2. Yield components for 9202-24-13 and 9208-05-01 in Arkansas test sites from 2001 through 2004.</b>						
Years	Loc. <sup>1</sup>	Line/Significance <sup>2</sup>	No. of seed/acre	Lint index	Seed index	Fibers/seed
			mil	g	g	ca. no.
03	Man	9202-24-13	6.181	7.5	10.7	17513
03	Man	<i>H,E,L</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>	<i>0,1,0</i>
03	Man	9208-05-01	5.699	6.6	11.6	19093
03	Man	<i>H,E,L</i>	<i>0,1,0</i>	<i>0,0,1</i>	<i>0,1,0</i>	<i>0,1,0</i>
03	Man	sl check	5.653	7.4	10.6	17524
01-04	K-ir	9202-24-13	7.569	6.9	10.0	20160
01-04	K-ir	<i>H,E,L</i>	<i>1,4,0</i>	<i>0,4,1</i>	<i>0,3,2</i>	<i>2,2,0</i>
01-04	K-ir	9208-05-01	6.365	7.4	11.5	18200
01-04	K-ir	<i>H,E,L</i>	<i>0,4,1</i>	<i>1,4,0</i>	<i>3,2,0</i>	<i>0,3,1</i>
01-04	K-ir	sl check	6.723	7.2	10.8	18877
01,02,04	C-ir	9202-24-13	7.723	6.3	9.1	18045
01,02,04	C-ir	<i>H,E,L</i>	<i>0,3,0</i>	<i>0,2,1</i>	<i>0,3,0</i>	<i>1,0,1</i>
01,02,04	C-ir	9208-05-01	7.741	6.5	10.1	17136
01,02,04	C-ir	<i>H,E,L</i>	<i>0,1,2</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>0,2,0</i>
01,02,04	C-ir	sl check	8.685	6.4	9.3	18142
01-04	M-ir	9202-24-13	5.979	7.1	10.2	18309
01-04	M-ir	<i>H,E,L</i>	<i>0,5,1</i>	<i>0,6,0</i>	<i>1,3,2</i>	<i>1,3,1</i>
01-04	M-ir	9208-05-01	6.303	7.0	11.2	17219
01-04	M-ir	<i>H,E,L</i>	<i>2,4,0</i>	<i>0,6,0</i>	<i>3,3,0</i>	<i>0,5,0</i>
01-04	M-ir	sl check	6.399	7.0	10.5	18259
02-04	R-ir	9202-24-13	9.302	7.2	10.0	19394
02-04	R-ir	<i>H,E,L</i>	<i>0,3,0</i>	<i>1,2,0</i>	<i>0,1,2</i>	<i>2,1,0</i>

02-04	R-ir	9208-05-01	9.216	7.4	11.3	18142
02-04	R-ir	H,E,L	0,3,0	1,2,0	1,2,0	1,2,0
02-04	R-ir	sl check	9.706	6.9	10.7	17567
01-04	All	9202-24-13	7.169	6.8	9.9	17903
01-04	All	H,E,L	1,16,1	1,15,2	1,11,6	6,7,2
01-04	All	9208-05-01	7.009	6.9	11.0	16402
01-04	All	H,E,L	2,13,3	2,15,1	8,10,0	1,13,1
01-04	All	sl check	7.254	6.7	10.3	16884
<sup>1</sup> Locations included irrigated tests at Manila (Man), Keiser (K-ir), Clarkedale (C-ir), Marianna (M-ir) and Rohwer (R-ir) plus non-irrigated tests at Keiser (K-ni) and Marianna (M-ni).						
<sup>2</sup> H,E,L = no. of tests that line was significantly higher (H), equal to (E) and lower (L) than check cultivars.						

**Table 3. Performance of two Univ. of Arkansas cotton lines at Tifton, Georgia in 2002 and 2003.**

Yr	Strain	Lint yield lb/a	%ck	Lint fract. %	%ck	Mic	%ck	UHM in.	%ck	UI %	%ck	Str g/tex	%ck
02	9202_24_13	1618	110	41.0	104	4.3	83	1.09	101	83.3	99	28.0	94
02	9208_05_01	1488	101	40.2	102	4.9	94	1.15	106	84.4	100	30.7	103
02	SG105	1473		39.6		5.2		1.08		84.4		29.8	
02	LSD0.01	144		NS		0.3		NS		NS		1.6	
02	CV %	8.1		2.6		3.8		3.0		0.9		3.2	
03	9202_24_13	749	94	43.1	107	4.8	92	1.09	101	83.8	99	29.6	97
03	9208_05_01	843	106	40.7	101	5.0	96	1.12	104	83.7	99	29.9	98
03	SG105	793		40.1		5.2		1.08		84.8		30.6	
03	LSD0.10	135		1.0		NS		0.03		NS		1.3	
03	CV%	13.2		1.4		4.4		1.6		0.9		2.6	

In Arkansas tests, basic yield components, i.e. lint index and number of seed per acre, of the two lines were similar to check cultivars (Table 2). Compared to the check cultivars, Arkot 9202 tended to have a higher lint fraction and smaller seed size. Opposite trends were found for Arkot 9208. Fibers of Arkot 9202 tended to be finer (lower micronaire), longer (greater UHM), equal strength, and lower elongation than the check cultivars. In contrast, fibers of Arkot 9208 tended to be courser (higher micronaire), equal length, higher strength, and equal elongation in comparison to the check cultivars.

The two lines were taller than the check cultivars with Arkot 9202 being taller than Arkot 9208 (Table 1). Although taller than the check cultivars, open boll ratings in 2003 and 2004 indicated that maturity of the lines was similar to the check cultivars (Table 4). Over six tests, leaf pubescence of Arkot 9202 and Arkot 9208 averaged 5.1 and 3.3, respectively, based on a rating scale of 1 (smooth leaf) to 7 (very hairy) (Bourland et al., 2003).

**Table 4. Results of single-location variables for two UA cotton lines in 2002, 2003, and 2004.**

Strain	2003 OB <sup>1</sup> ca. %	2004 OB ca. %	2002 Vert. <sup>2</sup> ca. %	2004 Vert. ca. %	2004 Fusarium <sup>3</sup> %	2003 TPB <sup>4</sup> %
9202-24-13	28	53	35	62	43	15
9208-05-01	26	58	35	64	53	.
PSC355	53	.	30	.	50	.
SG747/105	14	.	33	.	51	.
DP444BG/RR	.	51	.	68	.	.
FM960BR	.	36	.	57	.	.

ST4892BR	.	51	.	69	.	.
Frego bract (susceptible)	.	.	.	.	86	.
M-315 (resistant)	.	.	.	.	.	10
<sup>1</sup> Open bolls (OB) visually rated in 2003 and 2004 at Rohwer.						
<sup>2</sup> Incidence (ca. % of affected plants) of Verticillium wilt visually rated at Clarkedale in 2002 and 2004.						
<sup>3</sup> Fusarium wilt (% dead plants) in 2003 National Fusarium Wilt Test at Tallassee, AL.						
<sup>4</sup> Tarnished plant bug (TPB) at Keiser = % flowers with discolored anthers in test bordered with mustard in 2003.						

Arkot 9202 and Arkot 9208 displayed good host plant resistance traits. During selection, both lines were screened for resistance 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, neither line exhibited symptoms of bacterial blight even after field inoculations with the pathogen. In 2002, wilted plants associated with Verticillium wilt (caused by *Verticillium dahliae*, Kleb.) of both lines were less than 'PSC 355', but more than SG 105 (Table 4). In 2003, wilted plants of the lines were equal to DP 444BR/RR and 'ST 4892BR' but greater than 'FM 960BR'. In the 2004 National Cotton Fusarium Wilt Test at Tallassee, AL, response of Arkot 9202 to fusarium wilt [caused by *Fusarium oxysporum* Schlecht. F. sp. *vasinfectum* (Atk.) Snyd. & Hans.] was equal to the resistant check (Glass et al., 2004). In 2003, both lines were more resistant to tarnished plant bug (*Lygus lineolaris* (Palisot de Beauvois)) than the susceptible frego-bract check and equal to the check cultivars

Arkot 9202 and Arkot 9208 had the fifth and ninth highest yields of 19 lines evaluated in the 2003 Regional Breeders' Network Test (Table 5). These data suggest that the lines have wide adaptation. Yields of each line did not vary significantly from the highest yielding line at three of the eight locations. Over the eight locations, Arkot 9202 had second highest lint percent and Arkot 9208 had the second longest fiber length (Table 6).

Line	Over all	Albany, GA	Hartsville, SC	Keiser, AR	Miss.St, MS	Miss.St, ARS	Stoneville, MS	Tallassee, AL	Bossier City, LA
	lb/a	lb/a	lb/a	lb/a	lb/a	lb/a	lb/a	lb/a	lb/a
PSC 355	1278	1354	1648	821	1116	922	1862	1176	1325
FM 958	1252	1288	1744	759	1049	1063	1665	1285	1162
9202-24-13	1241	1275	1775	710	1064	1180	1705	1144	1081
DeltaPearl	1186	1156	1481	620	1116	1124	1404	1314	1275
9208-05-01	1177	1243	1535	857	1036	1049	1505	1276	914
Test mean	1161	1160	1495	761	1010	1036	1621	1146	1053
LSD (.05)	89	284	260	140	178	225	193	211	242

Line	Lint fract.	Boll size	Length	Uniformity	Strength	Elongation	Micronaire
	%	g	in.	%	g/tex	%	
PSC 355	40.8	5.11	1.12	84.8	32.6	9.8	5.0
FM 958	41.6	5.73	1.16	84.8	33.5	6.9	4.6
9202-24-13	42.3	5.54	1.13	84.1	30.3	8.2	4.4
DeltaPearl	41.1	5.17	1.18	84.3	32.2	7.2	4.7
9208-05-01	39.7	5.95	1.17	85.2	32.3	9.2	4.8
Test mean	40.7	5.66	1.14	84.6	32.1	8.7	4.7
LSD (.05)	0.6	0.27	0.01	0.4	0.5	0.2	0.1

The combinations of yield adaptation, fiber properties, and specific host plant resistance traits of these lines make the lines valuable to cotton breeding programs. Development of the two lines was supported in part by funding from

Cotton Incorporated. Small quantities of Arkot 9202 and Arkot 9203 seed may be obtained for breeding purposes from F.M. Bourland, P.O. Box 48, Northeast Research and Extension Center, Keiser, AR 72351. Unless specifically approved by the Arkansas Agricultural Experiment Station, the lines may not be used as recurrent parents in a breeding program.

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