

Cotton Comments

Cotton Variety Selection

Bill Robertson
Extension Agronomist -
Cotton

Fred Bourland
Director/Professor -
Cotton Breeding



The purpose of the University of Arkansas Cotton Variety Test is to provide an unbiased comparison of cotton varieties. Information included is intended to facilitate variety selection by identifying the potential adaptability of varieties to particular cotton-growing regions of the state. Bourland et al. (2000) documented several unintentional biases inherent to the testing program. These include management associated with varieties expressing herbicide and insect resistance. The biases tend to cancel each other so that no great advantage is given to any particular variety. Recognizing the genetic differences among entries is the ultimate goal of the test; therefore, all varieties are treated the same way. No specialized production inputs were implemented with respect to genetically enhanced varieties. Roundup Ready® varieties, Bollgard® varieties, and conventional varieties were all treated equally with respect to weed and insect control.

The Arkansas Cotton Variety Test was conducted at the Northeast Research and Extension Center at Keiser, the Delta Branch Station at Clarkedale, the Cotton Branch Experiment Station at Marianna, and the Southeast Branch Experiment Station at Rohwer.

A test with irrigation was conducted at each site, and a test without irrigation was conducted at Keiser and Marianna. Entries were separated into those tested for the first time (first-year entries not included in this report) and those having been entered in the Arkansas Cotton Variety Test the preceding year. Additionally, varieties could be entered in north Arkansas locations (Keiser-irrigated, Keiser-non-irrigated, and Clarkedale-irrigated), south Arkansas locations (Marianna-irrigated, Marianna-non-irrigated, and Rohwer-irrigated), or all.

One-Year Results

Yield and yield components as well as plant characteristics and fiber quality parameters are included in the one-year test results. Cultural practices including, but not limited to, fertility, irrigation, weed control, insect control, harvest preparation and harvest timing were consistent across all entries within each location. Each location was managed by the respective station personnel in such a manner as to insure that the needs for each entry were met while placing no particular entry at any advantage or disadvantage of another.

Two- and Three-Year Averages

These varieties make up much of the new varieties as well as the industry standards of today. Multi-year averages can reveal much about a variety's adaptability to a particular region across various environments that occur year to year.

Agronomic Characteristics

Leaf pubescence is a factor many consider when selecting varieties. Problems sometimes associated with hairy leaf types can often be avoided through the use of harvest-aid programs that promote drop of green leaves. Leaf pubescence can range from very little hair or smooth leaf to very hairy.

Earliness of varieties can be influenced more by management practices than genetic differences fixed within the variety. Generally, maturity relationships among varieties will remain similar across variable environments. Earliness as measured percent open at or near defoliation is an effective tool to compare relative maturity of varieties tested.

*Arkansas Is
Our Campus*

Visit our web site at:
<http://www.uaex.edu>

Of the fiber quality parameters, micronaire is perhaps the most affected by weather and management. Discounts as a result of high micronaire have been a problem for all Arkansas cotton producers. Varieties with above average micronaire will require differing strategies for harvest aid timings compared to below average varieties to avoid the potential for significant discounts. Application of harvest aids must be timely for varieties that tend to have high micronaire. Delaying harvest aid applications until 70% to 75% open will result in an increased percentage of discounts. Methods are available to assist in timing harvest aid applications to better manage quality. Contact your local county Extension agent for more details.

Recommendation

Variety selection should be independent of selecting a weed or insect control program. Variety performance in these trials was evaluated using standard production practices for non-transgenic varieties. Additional yield or reduced input cost of a transgenic variety may be necessary to compensate for fees associated with the value-added traits.

When comparing varieties, don't simply choose the top-yielding variety at any single location or year. Varieties that consistently produce yields near the top are often easier to manage than those that produce at the top in some locations and near the bottom at others. Pay particular attention to yield ranking in irrigated as well as dryland locations. This will help identify varieties that may tolerate stress better than others.

Every variety has its strengths and weaknesses. The challenge is to identify them and adjust management strategies to enhance strengths while minimizing the weaknesses. Ultimately, the best experience is based on first-hand knowledge. Evaluate yield and quality parameters of both the university and county testing programs to learn more about new varieties. The entire data set may be viewed online at www.arkansasvarietytesting.org.

Three-year averages are much more meaningful in terms of evaluating the performance of a variety. If three-year averages do not exist for the varieties you are most interested in, express your concerns and the value you place on this information to your seed companies. For some older varieties, data from previous publications may be useful.

Based on yield results, it is clear that growers should try some of the newer varieties on some acreage. But do not plant the farm in new varieties. Try them on limited acreage to see how they perform on your farm. Be very cautious in terms of acres planted to newer varieties if multi-year testing is not available.

References

- Bourland, F.M., N.R. Benson, and W. C. Robertson. 2000. Inherent biases in the Arkansas cotton variety testing program. pp.547-549. *In* Proc. Beltwide Cotton Production Res. Conf., San Antonio, TX. 4-8 Jan. 2000. National Cotton Council, Memphis, TN.

Table 1. Results of the 2004 Cotton Variety Test across six Arkansas test sites.

Variety	Lint		Lint		Stand	r	Ht.	r	Open		Mic	r	Fiber properties							
	yield	r	frac.	r					bolls	r			Len.	r	Unif.	r	Str.	r	Elo.	r
	lb/a		%						no./ft				cm		%		in.		%	
ST5599BR	1487	1	40.4	13	3.8	10	113	5	55	20	4.4	18	1.17	10	84.6	19	32.1	9	7.7	22
ST5242BR	1484	2	40.6	12	3.6	17	106	14	65	5	4.4	20	1.12	24	84.6	22	28.3	23	8.0	14
DP444BG/RR	1459	3	42.5	3	4.4	2	104	20	73	1	4.0	25	1.16	15	85.3	9	29.7	20	8.0	15
ST4892BR	1412	4	41.6	7	3.8	11	113	4	65	5	4.6	7	1.13	21	84.7	18	30.5	12	8.4	6
ST4793R	1389	5	41.8	5	3.5	22	114	2	66	3	4.7	2	1.12	23	84.4	24	30.3	15	8.3	9
DP432RR	1374	6	40.8	10	3.6	19	108	10	62	12	4.5	8	1.14	17	85.1	14	30.4	13	8.5	3
DP434RR	1368	7	42.7	2	3.6	18	108	8	62	12	4.2	22	1.20	2	85.8	3	27.5	25	8.0	16
DP393	1356	8	41.7	6	3.7	14	103	21	65	7	4.4	15	1.18	6	85.7	4	31.2	11	8.6	2
FM958LL	1355	9	41.0	8	4.3	4	100	25	60	14	4.4	19	1.19	3	85.3	10	34.3	3	7.8	21
ST4646B2R	1353	10	39.2	20	3.8	12	114	3	66	2	4.5	13	1.14	18	84.5	23	29.9	17	8.2	12
PHY410R	1349	11	39.5	19	4.4	3	108	9	58	17	4.6	6	1.16	13	85.6	5	31.4	10	8.9	1
FM960BR	1311	12	40.2	15	4.4	1	105	18	50	24	4.4	16	1.13	20	84.6	20	36.4	2	8.1	13
FM966LL	1290	13	40.3	14	4.0	8	105	17	50	22	4.1	23	1.17	8	85.9	1	36.7	1	7.7	23
PM1218BG/RR	1281	14	40.0	17	4.1	5	106	15	66	4	4.8	1	1.11	25	84.6	21	29.9	18	8.2	10
ST5303R	1274	15	39.6	18	3.9	9	112	6	63	8	4.5	12	1.13	22	85.3	11	34.0	4	8.4	5
DP494RR	1246	16	42.2	4	3.5	21	107	11	50	23	4.6	3	1.19	3	85.3	8	33.6	5	8.3	8
BCG28R	1240	17	40.2	16	3.4	24	102	23	63	9	4.6	4	1.17	8	84.7	17	30.1	16	7.7	24
DP451B/RR	1239	18	37.1	24	3.7	13	110	7	60	15	4.5	9	1.18	7	85.5	6	28.5	22	7.9	19
FM989BR	1236	19	38.6	21	3.3	25	105	19	58	18	4.1	24	1.18	5	85.4	7	32.7	7	7.8	20
DP424BGII/RR	1231	20	37.5	23	4.1	7	106	16	59	16	4.4	14	1.15	16	85.0	15	28.6	21	8.3	7
DP449BG/RR	1202	21	40.7	11	4.1	6	103	22	56	19	4.5	10	1.16	14	85.1	13	33.1	6	8.2	11
BCG24R	1198	22	40.9	9	3.5	23	107	13	62	11	4.6	5	1.14	19	84.9	16	29.9	19	8.5	4
DP555BG/RR	1189	23	44.2	1	3.6	16	115	1	46	25	4.5	10	1.16	12	84.3	25	30.3	14	7.3	25
DP436RR	1144	24	35.8	25	3.6	20	101	24	63	9	4.3	21	1.17	10	85.3	12	27.8	24	8.0	17
BCG295	1125	25	38.5	22	3.7	15	107	12	52	21	4.4	17	1.21	1	85.8	2	32.1	8	7.9	18
Mean	1304		40.3		3.8		107		60.0		4.4		1.16		85.1		31.2		8.1	
Var. LSD 0.10	75		0.9		0.3		5		4.0		0.2		0.01		0.5		1.1		0.2	
Loc. LSD 0.10	35		0.4		0.1		2		ns		0.1		0.01		0.2		0.5		0.1	
C.V.%	11.9		3.2		14.8		9.0		14.3		5.4		1.8		0.8		5.1		3.3	
R-sq x 100	72.2		84.9		74.6		76.0		70.9		75.6		84.1		76.3		85.5		82.9	
Prob (var x loc)	0.03		0.44		<.001		0.64		0.02		0.002		0.38		0.27		0.66		0.05	

Table 2. Two-year (2003-2004) average lint yields (lb/A) for cultivars at the six locations of the 2003-2004 Arkansas Cotton Variety Test.

Variety	Keiser		Keiser		Clarkedale		North		Marianna		Marianna		Rohwer		South		All	
	Irrigated	r	Non-irrig.	r	Irrigated	r	Avg.	r	Irrigated	r	Non-irrig.	r	Irrigated	r	Avg.	r	loc.	r
ST5599BR	1332	3	1149	2	1265	4	1249	3	1221	2	1163	2	1732	1	1372	1	1310	1
ST5242BR	1343	2	1205	1	1201	6	1250	2	1237	1	1169	1	1600	3	1335	2	1292	2
DP444BG/RR	1444	1	1092	5	1356	1	1297	1	1104	6	949	9	1600	2	1218	4	1257	3
ST4892BR	1238	7	1103	3	1305	2	1215	4	1149	4	1028	3	1578	4	1251	3	1233	4
ST4646B2R	1225	10	961	13	1128	10	1104	9	1109	5	958	8	1414	6	1160	6	1132	5
DP393	1186	14	1062	6	1098	13	1115	8	1059	9	995	5	1335	12	1129	8	1122	6
FM960BR	1202	12	1011	9	1145	9	1119	7	1092	7	932	12	1297	19	1107	9	1113	7
ST4793R	1238	6	985	10	1282	3	1168	5	1025	11	975	7	1139	25	1046	14	1107	8
DP434RR	1149	18	862	22	1077	15	1029	20	1151	3	947	11	1440	5	1179	5	1104	9
FM958LL	1250	4	925	15	1227	5	1134	6	1004	13	906	14	1314	16	1074	10	1104	10
DP432RR	1190	13	917	17	1083	14	1063	15	1085	8	947	10	1395	8	1142	7	1103	11
PM1218BG/RR	1170	17	1017	7	1032	18	1073	13	1029	10	846	17	1344	10	1073	11	1073	12
ST5303R	1186	15	934	14	1151	8	1090	10	919	18	863	16	1353	9	1045	15	1067	13
DP424BGII/RR	1219	11	964	12	982	20	1055	17	935	17	995	4	1275	20	1068	12	1061	14
FM989BR	1172	16	909	18	1155	7	1078	12	1014	12	902	15	1168	23	1028	17	1053	15
PHY410R	1242	5	903	19	1125	11	1090	11	966	15	777	19	1306	17	1016	18	1053	16
FM966LL	1094	21	1015	8	1042	17	1050	18	1002	14	762	22	1330	13	1031	16	1041	17
BCG28R	1236	8	922	16	1023	19	1060	16	900	20	796	18	1336	11	1011	19	1035	18
DP436RR	1039	25	874	20	971	21	961	25	887	21	987	6	1325	14	1066	13	1014	19
DP451B/RR	1138	19	853	24	1112	12	1034	19	959	16	661	25	1321	15	980	23	1007	20
DP449BG/RR	1082	24	846	25	1046	16	991	22	878	22	909	13	1231	21	1006	20	999	21
DP494RR	1230	9	1102	4	879	25	1070	14	824	24	721	24	1205	22	916	24	993	22
BCG24R	1093	22	859	23	947	22	966	23	915	19	775	20	1306	18	998	21	982	23
DP555BG/RR	1087	23	868	21	943	23	966	24	818	25	770	21	1395	7	994	22	980	24
BCG295	1099	20	977	11	906	24	994	21	837	23	725	23	1157	24	906	25	950	25
Mean	1195		972		1099		1089		1005		898		1356		1086		1087	

Table 3. Three-year (2002-2004) average lint yields (lb/A) for cultivars at the six locations of the 2002-2004 Arkansas Cotton Variety Test.

Variety	Keiser		Keiser		Clarkedale		North		Marianna		Marianna		Rohwer		South		All	
	Irrigated	r	Non-irrig.	r	Irrigated	r	average	r	Irrigated	r	Non-irrig.	r	Irrigated	r	average	r	loc.	R
ST5599BR	1263	2	1089	1	1130	1	1160	1	1254	1	1106	1	1767	1	1375	1	1268	1
ST4892BR	1116	5	1079	2	1103	2	1099	3	1217	2	994	3	1675	2	1295	2	1197	2
DP444BG/RR	1272	1	1029	3	1103	3	1135	2	1171	3	951	5	1624	3	1249	3	1192	3
FM960BR	1118	4	999	4	997	6	1038	5	1123	4	959	4	1427	7	1170	4	1104	4
ST4793R	1153	3	979	5	1046	4	1059	4	1110	5	910	7	1372	13	1130	5	1095	5
PM1218BG/RR	1071	9	942	6	936	10	983	6	1077	7	843	11	1452	4	1124	6	1054	6
ST5303R	1080	8	854	9	989	8	974	8	965	12	923	6	1448	5	1112	8	1043	7
FM989BR	1098	7	838	10	992	7	976	7	1095	6	867	9	1247	14	1070	14	1023	8
DP555BG/RR	1059	10	874	8	937	9	957	9	998	10	828	13	1412	9	1079	11	1018	9
DP451B/RR	1041	11	793	13	1011	5	948	10	1067	8	756	14	1411	10	1078	12	1013	10
BCG28R	1099	6	877	7	858	13	945	11	958	13	845	10	1428	6	1077	13	1011	11
DP436RR	986	14	824	11	882	12	897	13	928	14	1038	2	1379	12	1115	7	1006	12
DP449BG/RR	1007	13	793	14	916	11	905	12	1024	9	877	8	1396	11	1099	9	1002	13
BCG24R	1027	12	811	12	854	14	897	14	997	11	834	12	1415	8	1082	10	990	14
Mean	1099		913		982		998		1070		909		1461		1147		1073	