

# Arizona Upland Cotton Variety Testing Program, 1999

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## *Abstract*

*Each year the University of Arizona conducts on-farm variety trials across the state to evaluate the performance of upland cotton varieties. These tests provide many segments of the industry with unbiased, independent data on the performance of varieties from several seed companies when tested side-by-side under typical production practices. Ten trials were planted in the cotton producing areas of the state, ranging from Wellton in Yuma county to Kansas Settlement in Cochise county. Seed companies entered a maximum of two varieties per location resulting in eight to thirteen commercially available varieties per test. The results show that many varieties performed well at several locations, indicating good adaptation to Arizona conditions.*

## **Introduction**

Variety selection is the first and perhaps most critical choice cotton producers make each season. Many sources of information are available to producers to help them choose a good variety. The University of Arizona conducts several variety trials in order to provide growers with unbiased head-to-head comparisons of several varieties from different seed companies within a particular region.

The Arizona Upland Variety Testing program is our most intensive testing program. The trials in this testing program are conducted at several locations throughout all cotton producing regions of the state on grower's fields using their equipment and cultural practices. The test plots are large-scale "strip plots" that are replicated and randomized using proper field-plot techniques. Several seed companies enter the varieties they feel have the best chance of producing high yields of good quality fiber. The varieties included in the trials have already undergone testing in previous years and usually show good potential before they are placed in this large-scale strip test. The results of these trials are the closest possible to obtaining on-farm experience with a particular variety.

The purpose of this report is to present the results of our 1999 State-wide Upland Cotton Variety test.

## **Methods**

We planted trials at ten locations in 1999 - Wellton, Buckeye, Glendale, Maricopa, Coolidge, Stanfield, Marana, Solomon, Ft. Thomas, and Kansas Settlement. Eight to thirteen varieties were planted at each site. Varieties included in the 1999 tests were submitted to the university by the cooperating seed companies or public breeding programs which included Deltapine, Paymaster, Stoneville, Sure-Grow, AgriPro, Helena Cotton Research, Aventis, and New Mexico State University. Most tests were conducted on grower-cooperator fields, with plots (individual varieties) being a minimum of four rows wide (38 to 40 inch spacings), and extending the full length of the irrigation run. All treatments (varieties) were arranged in a randomized complete block design with three or four replications. The plots at Ft Thomas, Solomon and Kansas Settlement were two rows wide. We machine harvested at least two rows per plot and weighed the seedcotton harvested from each plot. Subsamples of the harvested seedcotton were ginned for turnout estimates, and lint samples were sent to the Phoenix classing office for HVI fiber quality analysis.

All data were analyzed statistically in a manner consistent with the experimental design by use of analysis of variance methods (Steel and Torrie, 1980), and procedures outlined by the SAS Institute (SAS, 1988). The six locations in Central Arizona contained eight varieties in common. A combined analysis of variance across all six locations was conducted on those eight varieties to obtain performance data on a regional scale.

## **Results and Discussion**

We grouped the results of the 1999 trials into three different regions of the State - Yuma, Central and Eastern.

The top yielding varieties in the Yuma region were STV474, SG747, and BXN47 (Table 1). These varieties also produced the highest micronaire values in the test. STV474 has shown good yields in several tests in previous years as well as in this test in 1999 (Silvertooth et al, 1999).

The highest yielding varieties across all locations in central Arizona included DP448B, HCR9257, SG747, and PM1560BG (Table 2). Of these four lines, DP448B and HCR9257 produced fiber with premium mics and showed the best overall fiber quality. DP675 produced the best fiber quality of all eight lines included in the test. Data for the six trials included in the region are presented in Tables 3-8.

In Eastern Arizona, PM1560BG, PM1440, SG747 showed consistently high yields across locations (Tables 9-11). FiberMax 989 was the top yielding variety in Cochise county. In previous years, PM1560BG and FiberMax 989 have produced good yields in Eastern Arizona (Lee et al, 1999; Silvertooth et al, 1999).

The data presented in this report are a good source of information on the performance of these varieties, but they only represent a starting point for determining the actual performance of a given variety on each individual farm. Other sources of information should be considered when making varietal choices. Seed companies also provide performance data for their varieties. Other growers in the area may have experience with a particular variety. Once the decision to try a new variety is made, incorporating that new variety into each cultural program should proceed in increments. Growers should test it on a limited scale at first to see first-hand how the variety performs on their own farm and to gain experience on the cultural needs of the variety.

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**Table 1. Performance of nine upland cotton varieties at Wellton, Az - 1999**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Stoneville	STV 474	1495 a	5.7	112	28.6
Sure-Grow	SG 747	1468 a b	5.6	109	26.4
Stoneville	BXN 47	1435 a b	5.5	113	28.8
Sure-Grow	SG 125	1396 b c	5.4	112	26.9
AgriPro	AP 7115	1395 b c	5.0	112	28.6
Deltapine	DP 388	1381 b c	5.2	111	29.8
Sure-Grow	SG 821	1333 c	5.5	110	28.6
Deltapine	Deltapine 50	1209 d	5.2	113	27.2
AgriPro	AP 6101	1062 e	5.0	118	32.3
LSD (P $\leq$ 0.05)		80	Planting Date: 9 March 1999		
C.V. (%)		4.1	Harvest Date: 9 Sept 1999		

\* Means followed by the same letter are not significantly different at (P<0.05) according to SAS, ANOVA  
LSD=Least Significant Difference.

**Table 2. Performance of eight upland cotton varieties in Central Arizona - 1999\*\*.**

Company	Variety	Lint lbs/A*	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Deltapine	DP 448B	1348 a	4.4	114	28.5
Helena	HCR 9257	1335 a	4.6	113	28.7
Sure-Grow	SG 747	1264 a b	5.1	111	26.1
Paymaster	PM 1560BG	1254 a b c	5.2	111	27.8
Paymaster	PM 1440	1155 b c d	4.9	111	27.9
Deltapine	DP 675	1138 c d	4.5	114	30.8
AgriPro	AP 6101	1128 c d	4.7	117	30.0
Sure-Grow	SG 248	1080 d	4.7	116	30.1
LSD (P<0.05)		126			

\* Means followed by the same letter are not significantly different at (P<0.05) according to SAS, ANOVA  
LSD=Least Significant Difference.

\*\* Data are averages of the following six locations: Buckeye, Glendale, Coolidge, Maricopa, Stanfield, and Marana.

**Table 3. Performance of nine upland cotton varieties at Buckeye, Arizona - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Helena Cotton Research	HCR 9257	1376 a*	4.8	111	28.2
Deltapine	DP 448B	1204 b	4.7	111	27.7
Paymaster	PM 1440	1136 b c	5.1	108	26.9
Deltapine	DP 33B	1124 b c	5.0	114	29.3
Sure-Grow	SG 747	1102 b c	5.3	108	25.2
Sure-Grow	SG 248	1084 b c	4.9	114	29.7
Paymaster	PM 1560BG	1046 c d	5.4	108	27.4
Deltapine	DP 675	1039 c d	5.0	112	31.3
AgriPro	AP 6101	959 d	4.9	117	29.8
LSD ( $P \leq 0.05$ )		121	Planting Date: 15 April 1999		
C.V. (%)		7.43	Harvest Date: 15 November 1999		

\* Means followed by the same letter are not significantly different.

**Table 4. Performance of eight upland cotton varieties at Glendale, Arizona - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Deltapine	DP 448B	1307 a*	4.6	111	28.4
Deltapine	DP 675	1305 a	4.8	113	31.6
Sure-Grow	SG 747	1257 a b	5.2	108	25.6
AgriPro	AP 6101	1177 b c	4.9	114	30.5
Helena Cotton Research	HCR 9257	1139 b c d	4.5	111	29.8
Sure-Grow	SG 248	1117 c d e	4.8	112	29.8
Paymaster	PM 1440	1049 d e	4.9	108	27.6
Paymaster	PM 1560BG	998 e	5.1	107	27.5
LSD ( $P \leq 0.05$ )		127	Planting Date: 13 May 1999		
C.V. (%)		7.39	Harvest Date: 2 December 1999		

\* Means followed by the same letter are not significantly different.

**Table 5. Performance of nine upland cotton varieties at Coolidge, Arizona - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Paymaster	PM 1560BG	1531 a*	5.1	112	27.7
Deltapine	DP 33B	1471 a b	4.3	113	28.4
Deltapine	DP 448B	1459 a b	4.1	114	27.9
Helena Cotton Research	HCR 9257	1418 a b	4.2	113	28.9
Sure-Grow	SG 747	1392 b c	4.9	112	25.5
AgriPro	AP 6101	1293 c d	4.5	116	28.6
Paymaster	PM 1440	1210 d	4.8	113	28.2
Deltapine	DP 675	1208 d	4.0	114	29.6
Sure-Grow	SG 248	1206 d	4.4	118	29.4
LSD ( $P \leq 0.05$ )		112.3	Planting Date: 16 April 1999		
C.V. (%)		5.34	Harvest Date: 28 September 1999		

\* Means followed by the same letter are not significantly different.

**Table 6. Performance of eight upland cotton varieties at Maricopa, Arizona - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Helena Cotton Research	HCR 9257	1417 a*	4.7	117	29.7
Sure-Grow	SG 747	1303 a b	5.0	118	27.6
Paymaster	PM 1560BG	1287 a b	5.1	117	29.6
Deltapine	DP 448B	1238 b c	4.1	118	29.2
Paymaster	PM 1440	1129 c d	4.8	115	28.5
AgriPro	AP 6101	998 d e	4.5	124	30.2
Sure-Grow	SG 248	895 e	4.7	123	31.1
Deltapine	DP 675	893 e	4.3	121	32.1
LSD ( $P \leq 0.05$ )		142	Planting Date: 16 April 1999		
C.V. (%)		8.42	Harvest Date: 3 December 1999		

\* Means followed by the same letter are not significantly different.

**Table 7. Performance of eight upland cotton varieties at Stanfield, Arizona - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Deltapine	DP 448B	1455 a*	4.9	113	28.8
Helena Cotton Research	HCR 9257	1381 a b	5.4	111	28.1
Sure-Grow	SG 747	1351 a b	5.4	112	27.8
Paymaster	PM 1560BG	1346 a b	5.4	112	28.6
Deltapine	DP 675	1314 a b	5.1	112	30.9
Paymaster	PM 1440	1311 a b	5.3	111	28.8
AgriPro	AP 6101	1216 b	5.2	117	31.3
Sure-Grow	SG 248	1008 c	5.2	116	31.2
Planting Date: 22 April 1999					
Harvest Date: 3 November 1999					

\* Means followed by the same letter are not significantly different.

**Table 8. Performance of eight upland cotton varieties at Marana, Arizona - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Deltapine	DP 448B	1427 a*	4.1	115	29.3
Paymaster	PM 1560BG	1315 b	5.0	108	26.1
Helena Cotton Research	HCR 9257	1277 b c	4.0	112	27.8
Sure-Grow	SG 747	1182 c d	4.7	111	24.7
Sure-Grow	SG 248	1173 c d	4.4	116	29.7
AgriPro	AP 6101	1125 d	4.1	115	29.4
Paymaster	PM 1440	1093 d	4.6	111	27.5
Deltapine	DP 675	1072 d	4.0	115	29.2
LSD (P≤0.05)		106	Planting Date: 16 April 1999		
C.V. (%)		6.00	Harvest Date: 1 November 1999		

\* Means followed by the same letter are not significantly different.

**Table 9. Performance of eleven upland cotton varieties at Ft. Thomas, AZ - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Paymaster	PM 1440	783 a	4.8	103	27.7
Sure-Grow	SG 747	744 a b	5.0	107	26.4
Deltapine	DP 5690RR	724 a b	4.1	108	31.8
Paymaster	PM 1560BG	688 a b	4.8	103	27.3
Sure-Grow	SG 501	679 a b	4.8	108	30.4
Aventis	FM 989	678 a b	4.2	111	31.9
Deltapine	DP 675	662 a b	4.3	105	29.5
AgriPro	AP 7115	624 b c	4.5	103	26.9
New Mexico State Univ.	1517-91	609 b c	4.4	113	31.7
Stoneville	ST BXN 16	609 b c	4.2	104	28.9
AgriPro	AP 9257	480 c d	4.5	105	28.4
LSD ( $P \leq 0.05$ )		158		Planting Date: 3 May 1999	
C.V. (%)		11.4		Harvest Date: 22 Nov 1999	

\* Means followed by the same letter are not significantly different at ( $P < 0.05$ ) according to SAS, ANOVA  
LSD=Least Significant Difference.

**Table 10. Performance of thirteen upland cotton varieties at Solomon, AZ - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Stoneville	BXN 47	1340 a	4.4	110	26.0
Paymaster	PM 1560BG	1286 a b	4.3	113	27.4
Sure-Grow	SG 747	1285 a b	5.1	111	25.0
Paymaster	PM 1440	1254 a b c	4.9	111	26.5
Sure-Grow	SG 501	1224 a b c d	4.4	115	27.8
AgriPro	AP 6101	1195 a b c d e	4.5	113	29.4
Sure-Grow	SG 125	1189 a b c d e	4.4	114	25.9
Aventis	FM 989	1136 b c d e f	4.1	112	28.3
AgriPro	AP 9257	1133 b c d e f	4.0	111	27.4
Deltapine	DP 90	1078 c d e f g	4.2	110	29.3
Deltapine	DP 5690RR	1054 d e f	4.1	110	28.5
Deltapine	DP 675	1023 e f g	3.9	113	29.4
Stoneville	BXN 16	1003 e f g h	4.4	108	25.6
LSD ( $P \leq 0.05$ )		195		Planting Date: 23 April 1999	
C.V. (%)		8.5		Harvest Date: 10 Nov 1999	

**Table 11. Performance of eleven upland cotton varieties at Kansas Settlement, AZ - 1999.**

Company	Variety	Lint lbs/A	Micronaire	Fiber Length (100ths)	Strength (GM/Tex)
Aventis	FM 989	1198 a	3.4	112	30.1
Paymaster	PM 1560BG	1191 a b	3.9	109	27.1
New Mexico State Univ.	1517-95	1138 a b c	3.7	113	32.2
New Mexico State Univ.	1517-99	1114 a b c	3.4	118	32.0
Stoneville	BXN 16	1049 a b c d	3.5	104	27.3
New Mexico State Univ.	1517-91	1029 a b c d	3.6	112	30.2
Sure-Grow	SG 125	1021 a b c d	3.8	111	25.8
Sure-Grow	SG 404	1006 b c d	4.1	110	28.0
Deltapine	DP 5409	996 c d	3.8	110	26.2
Deltapine	DP 675	993 c d	3.4	113	30.0
AgriPro	AP 7115	901 d	3.5	106	26.4
LSD ( $P \leq 0.05$ )		190		Planting Date: 22 April 1999	
C.V. (%)		8.1		Harvest Date: 10 Nov 1999	