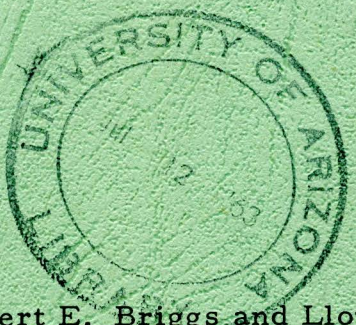
Report 213 February 1963

UPLAND COTTON

VARIETY TESTS 1961



Robert E. Briggs and Lloyd L. Patterson

Agricultural Experiment Station
UNIVERSITY OF ARIZONA
Tucson, Arizona

UPLAND COTTON VARIETY TESTS 1961[1]

Robert E. Briggs and Lloyd L. Patterson[2]

In 1961, experimental upland (Gossypium hirsutum) cotton variety tests in Arizona were conducted at the University of Arizona's Experiment Farms at Yuma, Marana, and the Cotton Research Center, Tempe. A test was also conducted at Safford in cooperation with a grower. These tests are part of a continuing program to compare yield and fiber properties of promising new strains and varieties with existing varieties.

Two types of variety tests were involved -- the Regional Variety Tests and the Miscellaneous Variety Tests. Four varieties -- Acala 4-42, Deltapine 15, Coker 100 and Lankart 57 -- were included in the Regional Variety Tests as part of an across-the-cotton-belt testing of these major varieties. In addition, the following commercial Acala varieties and promising advanced strains from Arizona, California, and New Mexico were also included in the Regional Tests at Yuma, Marana, and the Cotton Research Center, Tempe, Arizona:

Arizona	California	New Mexico
Acala 44-10	AXTE (experimental)	1517C
227 (experimental)	509N (experimental)	1517D
		B-479 (experimental)

[1]The assistance of Mr. Carl Curtis who made his land and equipment available for one of the variety tests and to other University personnel who helped conduct these cotton variety tests is gratefully acknowledged by the authors.

[2]Associate Agronomist, Department of Agronomy, Arizona Agricultural Experiment Station, Tucson, Arizona, and Research Associate in Agronomy, Cotton Research Center, Tempe, Arizona.

Miscellaneous Variety Tests included various commercially grown cotton varieties from across the cotton belt. One Arizona experimental strain was also included in tests at Yuma and the Cotton Research Center and a New Mexico experimental strain was included in the test at Safford. The test at Marana was not harvested for yield because of a poor stand.

All variety tests consisted of four-row plots 40 to 50 feet long with six replications. Twenty-five bolls were picked for boll and fiber determinations from four replications prior to the first picking for yield in all tests except the miscellaneous test at Marana where three replications were used. Boll and fiber data from all tests include lint percent, upper half mean fiber length (UHM), fiber strength, fiber fineness and the average number of bolls per pound of seed cotton. The upper half mean fiber length is given in inches. Strength and fineness values are indices: a higher value indicates greater strength or coarser fiber, respectively.

The center two rows of each plot were harvested for yield. Two hand pickings were made for yield in the tests at Marana, Safford, and the Cotton Research Center. The tests at Yuma were harvested with one machine and one hand picking.

Cultural practices throughout the season such as irrigation, fertilization, insect control and other production practices were the same for all varieties in each test.

Data were analysed statistically to determine real differences between varieties. Yield results were evaluated by means of Duncan's Multiple Range

Test which permits yield of any variety to be compared with any other variety. The Least Significant Difference (LSD) method was used in evaluating fiber property differences. With the LSD, only the check variety (principal variety grown in your area) should be compared with any other variety in the test.

Calculated lint yields, boll and fiber determinations, and plant heights for the Regional Variety Tests at Yuma, Cotton Research Center and Marana are given in Tables 1 through 3, respectively. In these tests, Deltapine 15 and AXTE were the only two entries in the top yielding group at all three locations. The New Mexico varieties and strain and Lankart 57 were among the low yielding entries at all locations. The plant stand of Lankart 57 was only fair at all three locations.

Yield, fiber results and plant heights of the Miscellaneous Variety Tests at Yuma and the Cotton Research Center are included in Tables 4 and 5, respectively. Fiber results and plant heights of the test at Marana are included in Table 6. Yield, fiber properties, and plant heights of the test at the Curtis Farm, Safford, are shown in Table 7. Two or three year lint yield averages are given for those varieties which were grown in successive years in the Miscellaneous Variety Tests at Yuma, Cotton Research Center and at the Curtis Farm, Safford.

In the 1961 miscellaneous variety test at the Cotton Research Center, yields of the Stoneville varieties were outstanding followed by Wescot. In the Yuma miscellaneous test, less than 90 pounds of lint per acre separated the first five entries of the top yielding group. At Safford, yield of Deltapine Smooth Leaf, 1517D, Wescot, Acala 44-10 and Auburn 56 were not significantly different.

Table 1
Yield and Fiber Data
Regional Variety Test
Yuma Branch Station, 1961

Elevation 50 feet

Variety	Calculated Lint Yield per acre*	Plant height at maturity	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
	lbs.	in.		in.			
Deltapine 15	1325 a	46	39.5	1.04	3.03	4.75	75
AXTE	1239 ab	48	37.3	1.07	3.65	4.50	70
Acala 4-42	1194 ab	49	39.1	1.06	3.81	4.36	63
509N	1179 ab	47	36.9	1.05	3.53	4.71	79
227	1169 b	56	37.6	1.11	3.86	4.50	75
Coker 100	1119 bc	41	36.2	1.04	2.95	4.43	81
1517D	1007 cd	50	34.3	1.18	4.10	4.39	73
Acala 44-10	999 cd	59	37.3	1.08	3.48	4.35	63
1517BR-1	964 d	54	36.4	1.12	3.63	4.18	69
B-479	904 d	47	34.8	1.13	3.97	4.15	75
Lankart 57	897 d	34	40.1	0.98	2.80	4.85	57
LSD 1%			1.2	0.04	0.21	0.30	5

*Yields of any two means followed by the same letter are not significantly different at the 5% level.

Table 2
Yield and Fiber Data
Regional Variety Test
Cotton Research Center, 1961

Elevation 1100 feet

Variety	Calculated Lint Yield per acre*	Plant height at maturity	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
	lbs.	in.		in.			
Deltapine 15	1459 a	39	37.7	1.02	3.00	4.79	81
AXTE	1421 a	47	35.6	1.07	3.48	4.71	67
509N	1413 ab	49	33.3	1.05	3.44	4.81	77
Acala 44-10	1403 ab	54	35.5	1.09	3.39	4.70	62
Coker 100	1346 ab	38	34.7	1.04	3.02	4.64	85
Acala 4-42	1342 ab	47	36.1	1.07	3.51	4.78	60
227	1299 b	61	35.1	1.10	3.69	4.76	68
1517D	1178 c	52	32.3	1.20	3.77	4.59	72
1517BR-1	1161 c	46	34.0	1.10	3.38	4.55	71
B-479	1089 c	51	33.1	1.12	3.87	4.54	70
Lankart 57	1084 c	25	37.1	0.96	2.70	5.08	61
LSD 1%			1.5	0.04	0.24	0.25	6

*Yields of any two means followed by the same letter are not significantly different at the 5% level.

Table 3
Yield and Fiber Data
Regional Variety Test
Marana Farm, 1961

Elevation 2000 feet

Variety	Calculated Lint Yield per acre*	Plant height at maturity	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
	lbs.	in.		in.			
AXTE	1518 a	42	35.8	1.09	3.30	4.58	63
Deltapine 15	1481 ab	38	38.6	1.02	2.82	4.44	77
Coker 100	1437 abc	37	36.0	1.05	2.77	4.66	76
509N	1419 bc	44	34.8	1.08	3.35	4.83	71
Acala 4-42	1416 bc	43	37.7	1.07	3.44	4.48	58
227	1370 cd	53	36.8	1.10	3.42	4.51	65
Acala 44-10	1361 cd	51	36.6	1.10	3.21	4.51	55
1517BR-1	1311 de	44	36.0	1.10	3.31	4.38	67
1517D	1274 e	47	33.8	1.17	3.57	4.46	63
B-479	1108 f	43	34.4	1.14	3.59	4.35	66
Lankart 57	1096 f	28	38.1	0.97	2.58	4.76	57
LSD 1%			1.0	0.03	0.19	0.30	4

*Yields of any two means followed by the same letter are not significantly different at the 5% level.

Table 4
Yield and Fiber Data
Miscellaneous Variety Test
Yuma Branch Station, 1961

Elevation 50 feet

Variety	Calculated lint yield per acre*		3 Year Average Yield 1959-61	Plant height at maturity	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
	lbs.		lbs.	in.		in.			
221	1698	a	1432**	58	37.8	1.14	3.68	5.00	70
DeKalb 220	1677	ab		52	36.5	1.05	3.08	4.45	73
Stoneville 7	1640	abc	1466**	49	38.5	1.05	2.94	4.81	84
Deltapine Smooth Leaf	1619	abc	1436	47	39.1	1.06	3.09	4.94	80
Stoneville 3202	1613	abc		50	36.9	1.00	2.82	4.35	82
Stardel	1542	abcd	1441	52	38.5	1.04	3.13	4.61	90
Acala 4-42	1473	bcde		55	38.2	1.07	3.75	4.56	60
Coker 124C	1471	bcde		52	36.0	1.04	3.00	4.48	73
Acala 44-10	1439	cde	1247	64	36.8	1.09	3.52	4.46	59
DeKalb 501-2	1387	cde		55	35.3	1.12	3.57	4.13	64
Auburn 56	1310	de		51	34.3	1.04	3.07	4.37	74
DeKalb 108	1282	de		50	34.6	1.02	3.03	4.30	68
Wescot	1267	de		59	36.3	1.07	3.26	4.59	77
Dixie King	1183	e		51	34.1	1.03	3.00	4.31	64
LSD 1%					1.6	0.05	0.24	0.31	7

* Yields of any two varieties followed by the same letter are not significantly different at the 5% level.

**Two year average, 1960-61.

Table 5
Yield and Fiber Data
Miscellaneous Variety Test
Cotton Research Center, 1961

Elevation 1100 feet

Variety	Calculated lint yield per acre*		3 Year Average Yield 1959-61	Plant height at maturity	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
	lbs.		lbs.	in.		in.			
Stoneville 7	1459	a	1430**	37	38.6	1.00	2.71	5.16	89
Stoneville 3202	1452	ab		34	37.9	0.95	2.62	4.84	86
Wescot	1370	bc		46	37.9	1.05	3.00	4.75	82
Deltapine Smooth Leaf	1358	c	1281	35	38.3	1.00	2.83	4.94	91
221	1318	cd		48	37.1	1.14	3.45	4.94	73
Stardel	1291	cde	1286	35	37.4	1.03	3.14	4.94	93
Auburn 56	1261	def		37	35.1	1.01	2.85	4.74	80
Acala 44-10	1255	def	1290	49	36.4	1.10	3.41	4.40	65
DeKalb 220	1248	def		37	36.1	1.01	2.87	4.78	80
DeKalb 501-2	1232	def		45	35.9	1.12	3.49	4.30	74
Coker 124C	1222	ef	1311	38	35.9	1.04	2.94	4.74	81
DeKalb 108	1206	ef		37	34.6	1.04	2.98	4.78	70
Acala 4-42	1184	fg	1321**	43	37.8	1.08	3.56	4.39	62
Dixie King	1113	g	1029	36	34.2	1.02	2.90	4.95	68
LSD 1%					1.0	0.04	0.19	0.32	7

*Yields of any two varieties followed by the same letter are not significantly different at the 5% level.

**Two year average, 1960-61.

Table 6
Fiber Data
Miscellaneous Variety Test
Marana Farm, 1961

Elevation 2000 feet

Variety	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
		in.			
Wescot	37.8	1.03	3.01	4.52	78
Stoneville 7	37.4	1.03	2.66	4.62	90
DeKalb 108	34.2	1.00	2.75	4.07	77
Dixie King	34.2	1.01	2.78	4.52	69
Coker 124C	35.3	0.99	2.79	4.30	82
Stoneville 3202	37.2	0.93	2.53	4.32	89
Auburn 56	34.2	0.98	2.86	4.27	81
Acala 4-42	38.3	1.06	3.55	4.30	64
Deltapine Smooth Leaf	37.7	0.99	2.97	4.27	91
DeKalb 220	35.9	0.99	2.80	4.25	81
Acala 44-10	36.2	1.04	3.25	4.45	60
DeKalb 501-2	35.6	1.07	3.40	4.28	64
LSD 1%	1.2	0.06	0.19	0.41	6

Table 7
Yield and Fiber Data
Miscellaneous Variety Test
Curtis Farm, Safford, 1961

Elevation 2900 feet

Variety	Calculated lint yield per acre*	3 Year Average Yield 1959-61	Plant height at maturity	Lint %	Fiber length U. H. M.	Fiber strength	Fiber fineness	Bolls per pound
	lbs.	lbs.	in.		in.			
Deltapine Smooth Leaf	1172 a		25	38.8	1.06	2.91	4.25	88
1517D	1171 a	1174	37	34.5	1.24	3.44	4.34	64
Wescot	1148 ab		35	38.2	1.10	2.89	4.55	72
Acala 44-10	1129 ab	1268	32	37.5	1.15	3.16	4.62	57
Auburn 56	1119 abc		27	35.5	1.04	2.75	4.44	77
DeKalb 501-2	1087 bcd		34	36.8	1.16	3.29	4.22	61
1517C	1045 cd	1144	31	35.8	1.17	3.45	4.08	66
1517BR-1	1038 d	1163	36	36.4	1.19	3.33	4.06	65
B-479	1010 d		38	35.2	1.18	3.52	4.25	65
LSD 1%				1.0	0.05	0.18	0.26	4

*Yields of any two varieties followed by the same letter are not significantly different at the 5% level.

Considering the 1961 yields and results from recent years, varieties which originated in the southeastern United States have given excellent yields in Arizona. Fibers of these southeastern varieties, however, have generally been shorter, weaker and coarser than Acala types. Some differences between varieties were undoubtedly masked in these variety tests where production practices were the same for all varieties in any one test. With the use of the same management practices for different varieties the yield potential of each individual variety can not be fully realized; instead, a gross comparison results. The final yield of any cotton variety is greatly influenced by management the crop receives throughout the season. In addition to management, cotton yield depends on other factors such as previous cropping history and the productivity of the soil. Thus, in selecting a variety many factors should be considered. Variety recommendations are published each year by the University of Arizona (Bulletin A-4) and can be obtained from the local County Agricultural Extension office or from the College of Agriculture of the University of Arizona.