

Pima Improvement

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Three experimental Pima strains (P15, P17 and E1044) were evaluated extensively in 1965. P15 was grown throughout the cotton growing areas of the state with major emphasis at the lower elevations. E1044, P17 and, to a lesser extent, P18 were evaluated mainly at the higher elevations. P15 is considered to be best adapted at the lower valleys where it begins fruiting early and low on the plant, and continues fruiting throughout the season. E1044, P17, and P18, when grown at low altitudes, generally do not set fruit until later in the season, and are rank and unproductive. It appears as if P15 has more tolerance to the higher temperatures of the lower valleys. E1044 and P17 are best adapted at the higher elevations where they set fruit relatively low, have a desirable plant height, and are productive.

The lint yields and gin turnouts of these strains along with other experimental strains, S-1, and S-2 are included in the Pima Regional Strain Tests (Table 1). P15 was among the more productive strains at the three locations. P17 was among the more productive only at Marana. CB58 yielded well at all locations; however, its fiber is generally shorter and weaker than Pima S-2. Table 2 gives lint yields and gin turnouts for replicated strip plantings at the Safford Experimental Station and the Cotton Research Center. The results from similar strip plantings are given by counties elsewhere in this report (Graham County - John Sears, Pinal County - Sam Stedman, and Maricopa County - Chuck Farr). Seven tests are included from Graham County, three tests from Pinal County and one test from Maricopa County. Other tests were grown but weather conditions have delayed second pickings and final yields are not available.

In Graham County (high altitude), P15 was earliest, had the shortest plants, and yielded well in the four tests where it was included (Safford Exp. Sta., Scott Pace, Carl and Phil Curtis, and Farrell Layton). P17 and E1044 yielded well as compared with S-1 or S-2, and they were significantly different in yield only at Farrell Layton's. P17 and E1044 were taller, began fruiting higher on the plant, and were later than Pima S-2. P18 was somewhat erratic. It yielded well in the test on the Dale Clonts farm and yielded poorly at the Curtis farm.

In Maricopa and Pinal Counties, the yields of P15 and S-2 were not significantly different. They had similar plant heights and began fruiting at about the same height on the plant. In 1963 and 1964, P15 began fruiting lower on the plant and had a shorter plant than S-2. Perhaps the cooler weather during the early portion of the 1965 fruiting season allowed both to fruit relatively low on the plant. P15 appears to have more heat tolerance than S-2 and under somewhat higher temperatures during the early part of fruiting season, it is likely to fruit lower, be more productive and have a shorter plant than S-2.

Table 1. Regional Pima Tests - Cotton Research Center, Peoria and Marana, 1965

	Cotton Research Center		Peoria (Bennett farm)		Marana	
	Lint/Acre	Percent Lint	Lint/Acre	Percent Lint	Lint/Acre	Percent Lint
S-1	550cd	31.8	761b	32.1	817bc	32.0
S-2	640abc	34.2	831b	35.6	994a	35.9
E1044	484d	31.8	559c	31.8	835bc	32.4
P15	660ab	32.9	1003a	35.1	1013a	35.2
P17	549cd	33.3	524c	34.9	945a	35.1
P18	330e	31.9	717b	34.2	810c	34.3
Stroman						
Pima #1	595bc	33.2	820b	34.2	918ab	34.8
CB58	703a	33.5	1075a	34.6	969a	34.2

At a given location, yields followed by the same letter are not significantly different.

Table 2. Pima Strip Tests - Safford Experimental Station and Cotton Research Center, 1965

	Lint/Acre	Gin Turnout
(Safford Experimental Station)		
S-2	701a	35.7
P15	719a	34.8
P17	729a	35.0
P18	608a	34.2
E1044	649a	32.9
(Cotton Research Center)		
S-2	1018a	33.8
P15	1095a	33.0

At a given location, yields followed by the same letter are not significantly different.

Table 3. Ginning and fiber properties, and yarn strength data from Pima strip plantings, 1965*

Strain	Percent lint	Fiber 2.5%	Span 50%	Length 66.7%	Fiber strength (T ₁)	Fiber fineness (Micronaire)	Strength 22's yarn
<u>A and F Bergero, Scottsdale, Ariz.</u>							
S-2	36.1	1.44	.72	.55	34.3	3.84	192
P15	36.0	1.45	.75	.57	35.1	3.91	192
P17	35.5	1.52	.76	.58	36.4	3.85	194
E1044	32.6	1.49	.75	.56	34.3	3.53	189
<u>Jack Bennett, Peoria, Ariz.</u>							
S-2	34.8	1.39	.69	.52	32.6	3.97	186
P15	35.1	1.45	.73	.55	32.7	4.05	185
<u>Joe Wiehl, Gilbert, Ariz.</u>							
S-2	36.4	1.43	.74	.56	32.5	4.01	184
P15	36.4	1.43	.72	.56	33.3	4.04	188
<u>James Hamilton, Queen Creek, Ariz.</u>							
S-2	37.3	1.43	.73	.55	32.8	3.86	189
P15	37.1	1.43	.74	.56	33.5	3.86	190
<u>W. Wuertz, LaPalma, Ariz.</u>							
S-2	35.0	1.45	.74	.55	32.7	3.63	186
P15	35.1	1.45	.73	.54	32.7	3.65	185
<u>C. B. Shiflet, Coolidge, Ariz.</u>							
S-2	36.1	1.40	.71	.54	32.2	3.83	176
P15	36.0	1.48	.74	.55	31.6	3.98	178
<u>Emmett Grasty, Maricopa, Ariz.</u>							
S-2	35.1	1.45	.74	.55	32.5	4.10	186
P15	35.5	1.48	.75	.57	31.5	4.00	184
<u>Allan McFaddin, Maricopa, Ariz.</u>							
S-2	36.0	1.37	.70	.53	34.1	3.95	188
P15	36.3	1.43	.74	.56	33.6	4.15	192
P17	36.2	1.45	.71	.53	35.1	3.78	193
<u>Cotton Research Center, Phoenix</u>							
S-2	35.4	1.40	.68	.50	33.2	3.84	-
P15	35.6	1.41	.70	.51	33.4	3.87	-
<u>Art Pacheco, Marana, Ariz.</u>							
S-2	36.0	1.41	.72	.54	31.2	3.69	181
P15	35.5	1.48	.75	.57	31.7	3.64	184
P17	34.9	1.51	.75	.56	32.7	3.75	181
E1044	33.6	1.50	.76	.57	30.0	3.64	178

*Based on 200-boll samples.

Strain	Percent lint	Fiber 2.5%	Span 50%	Length 66.7%	Fiber strength (T ₁)	Fiber fineness (Micronaire)	Strength 22's yarn
<u>Scott Pace, Solomon, Ariz.</u>							
S-2	38.1	1.36	.69	.52	31.5	3.90	172
P15	37.9	1.42	.71	.54	31.2	3.75	176
P17	37.4	1.50	.75	.57	33.0	3.88	184
P18	36.7	1.45	.73	.54	33.0	3.65	184
E1044	35.3	1.43	.68	.51	29.6	3.50	171
<u>Lee Hunt, Thatcher, Ariz.</u>							
S-1	37.1	1.37	.70	.52	31.5	3.58	179
P17	37.4	1.49	.73	.56	33.4	3.81	186
E1044	36.5	1.44	.69	.52	31.2	3.55	173
<u>Dale Clonts, Solomon, Ariz.</u>							
S-2	38.6	1.37	.69	.53	30.8	3.53	177
P17	37.6	1.47	.72	.54	33.6	3.95	181
P18	37.7	1.42	.72	.54	33.6	3.58	183
E1044	36.5	1.44	.71	.53	31.4	3.77	171
<u>Larry Carpenter, Solomon, Ariz.</u>							
S-2	35.6	1.43	.67	.49	28.8	3.73	166
P15	37.3	1.49	.71	.53	32.3	3.73	178
P17	36.7	1.51	.71	.53	32.5	3.80	178
E1044	36.0	1.52	.74	.54	31.7	3.85	179
<u>Bob Colvin, Eden, Ariz.</u>							
S-2	37.3	1.38	.71	.53	31.6	3.93	172
P17	35.1	1.50	.75	.57	33.8	3.86	181
E1044	33.7	1.46	.70	.52	30.1	3.51	177
<u>Max Green, Safford, Ariz.</u>							
S-2	39.4	1.29	.62	.47	30.7	3.98	171
P17	38.6	1.41	.67	.51	31.4	3.93	171
E1044	37.0	1.34	.63	.48	29.2	3.57	166
<u>Carl and Phil Curtis, Safford, Ariz.</u>							
S-2	37.2	1.36	.66	.49	29.2	3.88	165
P15	38.3	1.44	.72	.54	30.1	3.83	175
P17	36.1	1.51	.72	.54	30.7	3.94	178
P18	34.9	1.45	.72	.54	30.0	3.70	177
E1044	34.9	1.44	.71	.54	28.0	3.67	169
<u>Farrell Layton, Thatcher, Ariz.</u>							
S-1	37.0	1.37	.69	.52	30.4	3.54	177
S-2	38.9	1.39	.70	.53	31.0	3.87	170
P15	39.0	1.41	.69	.52	31.1	3.76	172
P17	38.1	1.48	.70	.53	32.3	3.74	179
E1044	36.7	1.41	.68	.51	30.7	3.58	167

Table 3 shows the ginning and fiber properties, and yarn strengths for these strains in the various strip tests. At low altitudes, P15 appeared to have more stability for fiber length than did S-2. Where S-2 was relatively long, P15 was of similar length. Where S-2 was shorter (Peoria and Coolidge), P15 was longer than S-2. At the higher elevations, P15, P17 and E1044 all had longer fiber than S-1 or S-2, with the longest fiber being from P17.

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Long Staple Cotton Breeding

H. Muramoto and W. E. Bryan

The major objective of the long staple cotton breeding program has been to develop breeding methodology for the incorporation into one strain, the desirable characteristic of high yields, superior spinning quality and good agronomic traits.

From the research in breeding methodology advanced strains yielding 15 to 20 percent better than Pima S-2 have been selected. These selections were made out of a multiple cross and composite gene pool method. The following table shows the comparison of CB - 58 (Composite B) and Pima S-2 in 1963 and 1964 at Marana, Arizona.

	1963 Lint/A	1964 Lint/A	1965 Lint/A
Pima S-2	962	690	Not available due
CB-58-3-1	1128	785	to severe storm loss.

The 1963 data include 2nd picking. The 1965 data are not available due to prolonged rains which caused severe storm loss in the field.

Several lines of storm-proof Pima cotton have been isolated and this desirable character is being incorporated into all advanced strains in our breeding program.

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