Pima S-1 Cotton

A Better Long-Staple Variety for Arizona?

By W. E. Bryan
Plant Breeding

Most cotton growers believe that before any substantial acreage of long staple cotton can be grown profitably in Arizona it will be necessary to have a variety with (1) high yield of lint per acre; (2) strong lint with good spinning quality; (3) plant type suitable for mechanical harvesting; and (4) wide adaptation, so that it can be grown throughout the entire long-staple area, requiring only a single variety.

It is the purpose of this article to show to what extent the Pima S-1 variety conforms to the requirements as set forth above, as determined from the data of 1952. The plots were located on five different stations, extending from Yuma, Arizona, with a growing season of 348 days to State College, New Mexico, with a growing season of 208 days. This difference in growing conditions should give some idea as to the extent of adaptation of the Pima S-1 variety.

Yield of Lint. As shown by the table, the average lint yield of Pima S-1 for the five stations was 869 pounds per acre, while that of Pima 32 was 753 pounds per acre. This represents an increase of 15.4 percent of Pima S-1 over Pima 32 in lint per acre. It is also of interest to compare the lint yields of the two varieties at each of the five stations. Pima S-1 significantly outyielded Pima 32 at each of the five stations with the exception of the Sacaton where the yields were practically the same.

Since yield is considered the best indication of adaptation when a variety is grown under different climatic and soil conditions, we may safely conclude that Pima S-1 has satisfactory adaptation. Of course, this does not mean that Pima S-1 or Pima 32 yields equally well at all the five stations, as an inspection of the table will show that they do not. Yuma, Arizona, with a growing period of 140 days longer than that of State College, New Mexico, would certainly be expected to give the greater yield for the simple reason that the cotton plant has more time in which to set its crop at Yuma.

Comparison of Pima S-1 and Pima 32 Cotton Varieties for Lint per Acre, Bolls per Pound, Percent Lint, Lint Index and Fiber Properties at Five Designated Stations in 1952. Compiled from Data Furnished by Mr. R. H. Peebles, U. S. Field Station, Sacaton, Arizona.

	Yuma	Mesa	Sacaton	State College of New Mexico	Ysleta	Average
Bolls per pound:						
Pima S-1	144	157	139	93	108	128
Pima 32	164	174	135	113	122	145
Percent lint:						
Pima S-1	32.5	32.3	33.6	35.6	37.1	34.2
Pima 32	27.8	27.2	29.6	31.3	32.5	29.6
Lint index:						
Pima S-1	5.7	6.1	6.2	7.6	7.5	6.6
Pima 32	4.7	4.7	5.1	6.2	6.4	5.4
Fiber length, inches, Upper half mean:						
Pima S-1	1.30	1.37	1.33	1.38	1.32	1.34
Pima 32	1.34	1.35	1.37	1.48	1.42	1.39
Fineness (Micronaire):						
Pima S-1	3.51	3.54	3.57	3.92	3.88	3.68
Pima 32	2.92	2.82	3.22	3.45	3.37	3.15
Strength (Pressley units):						
Pima S-1	8.98	9.55	9.25	8.78	9.10	9.13
Pima 32	9.37	9.79	9.85	9.60	10.03	9.72
Lint per acre, pounds:						
Pima S-1	1022	937	730	737	922	869
Pima 32	873	825	743	539	785	753

However, it will be seen from the table that Pima S-1 produced 737 pounds of lint per acre, while Pima 32 had a yield of 539 pounds per acre at State College, New Mexico. This yield of 200 pounds of lint per acre for Pima S-1 in excess of Pima 32 emphasizes the greater adaptation of Pima S-1.

Lint Percent and Lint Index. The lint percentage of Pima S-1 was significantly higher than that of Pima 32 at each of the five stations. The average lint percentage of Pima S-1 was 34.2, while that of Pima 32 was 29.6. Since the seed weights of the two varieties were nearly the same at all the stations, it is safe to conclude that the increased lint percentage and lint index of Pima S-1 over those of Pima 32 were due partly, but not entirely, to a more abundant set of fibers on the seed of Pima S-1. Pima S-1, having a coarser fiber than that of Pima 32 would be expected to have a greater lint percent and a greater lint index even with the same abundance of lint on the seed because the individual fibers weigh more per unit length.

Boll Size. The table shows that the average number of *bolls per pound* for Pima S-1 for the five stations was 128, while that for Pima 32 was 145. Boll size of Pima S-1 was 13.2 percent greater than that for Pima 32.

It is of interest to note that increased boll size is not associated with increased yield of lint per acre, at least under the conditions of this experiment. At Yuma, for example, the number of bolls per pound was 144, and yield of lint was 1022 pounds per acre for Pima S-1, while at State College, New Mexico, bolls per pound were 93 and yield of lint per acre was 737 pounds.

Fiber Properties. The longer fibers of Pima 32 are longer than those of Pima S-1 as indicated by the *upper half mean* in the table, but the *mean fiber length* (not shown in the table) of Pima S-1 is somewhat greater than that for Pima 32, showing that Pima S-1 has a greater uniformity lint factor which is considered to be an advantage in spinning performance. The fiber of Pima S-1 is consistently coarser than that of Pima 32 at each of the five stations as shown by micronaire determinations in the table.

The fiber of Pima 32 is distinctly stronger than that of Pima S-1. The average strength in Pressley units for Pima 32, and Pima S-1 were 972, and 913 respectively. The results of the spinning tests for 1952 are not available, but the tests for previous years indicate that Pima S-1 is about

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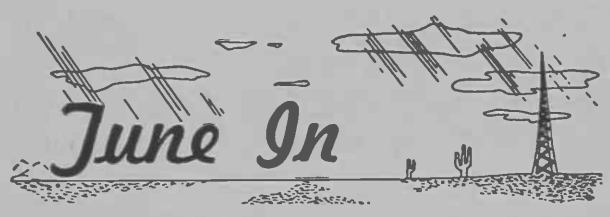

DAILY (EXCEPT SUNDAY)

KTAR, Phoenix, 6:15 a.m. — Farm Front — Maricopa County Extension Agent. (6:10 a.m. on Saturdays)

MONDAYS

KYMA, Yuma, 7:00 a.m. — On the Farm Front.

MONDAY THROUGH FRIDAY

KYUM, Yuma, 7:20 a.m. — Yuma County Agricultural Extension Service Radio Program.

TUESDAYS AND THURSDAYS

KCLS, Flagstaff, 6:15 a.m. — Your County Agent Reports.

FRIDAYS

KCKY, Coolidge,Casa Grande, 4:00 p.m. — Pinal County Farm and Home Program.

SATURDAYS

KGLU, Safford, 1:00 p.m. — Stepping Along with the Agricultural Extension Service.

Does Arizona 44 Meet Trade Needs?

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tiplied by Arizona's 1952 Upland production of 904,200 500-pound bales, this shows an increased return to Arizona producers of $678,150 due to the greater staple length of A-44.

Fringe Benefit

A benefit more difficult to measure, but not less important, is the increased interest of mills in Arizona cotton evidenced by the increasing number of salaried representatives of Eastern merchants appearing in the Phoenix market. These buyers have direct mill outlets for large quantities of Arizona cotton, and their presence has resulted in substantial improvements in the buying basis during the past year. If Arizona is able to continue her volume of A-44, and to eliminate undesirable varieties from production, these buyers will continue to come into the Phoenix market to buy Arizona cotton.

Cantaloup Pests Have Enemies, Too

(From page 8)

cifically to control an infestation occurring on the crop at the time, and not as a preventive measure. It is not desirable to make routine applications when the plants have reached a certain stage of development.

Take Care!

Parathion is extremely toxic to humans and should be used only by a trained operator who will assume full responsibility and enforce the precautions prescribed by the manufacturers.

Pima S-1 Cotton

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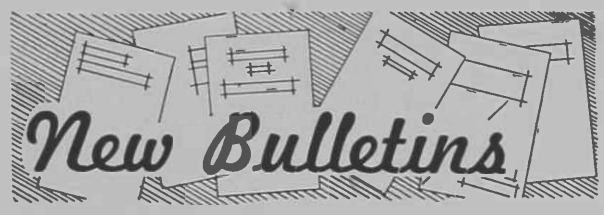
equal to Egyptian Karnak cotton, but not quite as good as Pima 32 or Amsak.

Type of Plant. Pima S-1 was bred originally for a plant height of 40 to 50 inches at Tucson on a medium heavy soil with normal irrigation. Pima S-1, when grown under these conditions, produces a plant which can be harvested with the cotton picker, provided defoliation is sufficiently complete.

But when Pima S-1 is grown on a heavy, fertile soil, such as alfalfa sod and irrigated heavily, it may grow considerably higher than 50 inches, as has happened in the Salt River and Yuma valleys. Under such conditions it is no longer a "Dwarf Pima," but even here it does not grow as high as Pima 32 or Amsak.

Present Status. Considering the lint yield per acre, lint quality, spinning performance and growth adaptation, Pima S-1 seems to have some promise as a commercial variety and the seed is being increased for a more extended acreage. With more experience in growing Pima S-1, it may be possible to obtain maximum yields of lint without at the same time growing too tall a plant.



Ask your County Agricultural Agent for a copy of any of these new bulletins or circulars. They are free to Arizona farmers and stockmen.

Experiment Station

Bulletin 246, "Cost of Pumping Irrigation Water, Pinal County, 1951."

Forty wells in Pinal County were used in this detailed survey of pumping costs by electric and gas powered pumps. Data are shown by graphs and tables. Procedures and results are covered in the text.

Extension Service

Circular 148-Revised, "Fruit Insect Control Hints."

This is a 1953 revision of the extension recommendations for control of deciduous fruit-tree pests in Arizona. Specific information is given.

Circular 179-Revised, "Cotton Insect Control, 1953."

Complete, up-to-date cotton insect control information is supplied, including hints on airplane application of insecticides.

Miniature Farm On U of A Campus

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Mohave soil. After cropping these soils for thirteen years, the nitrogen content of the two reached a temporary equilibrium point midway between that of the virgin soils. After another six years the nitrogen content of the Gila soil associated with the alfalfa rotation had remained constant while that of the Mohave soil had shown a serious slump. In both cases the soils in the "wheat-hegari" rotation had an unfavorably low nitrogen content.

The low nitrogen content of wheat grown on soils depleted in nitrogen is a direct reflection of the fertility of the soil. Certainly the discriminating buyer will choose the wheat with the highest protein content. This can only be grown on ground well supplied with nitrogen. The nitrogen content of the wheat grown on Gila soil in the wheat-hegari rotation was reduced by 50% during 23 years of cropping as a result of using a rotation lacking a legume. When it is realized that wheat is priced on the basis of its protein content the importance of maintaining a high nitrogen content in the soil becomes apparent.

Nitrogen Content of Wheat Grain
Gila Soil — 1952

	% nitrogen	% protein
Alfalfa rotation	2.5	15.6
Wheat—hegari rotation	1.25	7.8

This experiment disproves the old saying that only water is required to make a desert soil bloom. Experiments and practice have shown that desert soils cannot maintain a high level of productivity without the use of good cropping and fertilization practices. Inasmuch as Arizona's agriculture is becoming of age and most of the cropped land consists of Red Desert Soils it appears that fertilization must become a standard practice on these soils to maintain high yields and to insure crops of high nutritional quality.

Circular 203-Revised, "Defoliating Cotton in Arizona, 1953."

This is a complete revision of last year's circular. Latest available information on defoliating is included.

Circular 204-Revised, "Requirements for Arizona 4-H Club Work."

This circular lists in detail the requirements for all 4-H projects available in the state. It is for use of 4-H members and leaders.