History of extra-long staple cottons

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HISTORY OF
EXTRA-LONG-STAPLE COTTONS

by
Joseph C. McGowan

A Thesis Submitted to the Faculty of the
DEPARTMENT OF HISTORY
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF ARTS
In the Graduate College
THE UNIVERSITY OF ARIZONA

1 9 6 0
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APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

H. E. BATEMAN
Associate Professor of History
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INTRODUCTION

Extra-long staple cotton, highly important commodity to the economies of Egypt and Sudan, is a specialized product. They produce ninety per cent of all the world supply of this variety. In a lesser degree this is also true of Peru. These three countries export most of their cotton crops.

Only the United States, the smallest in production among the four extra-long staple growing nations, consumes the bulk of its own domestic crop and imports more foreign cotton of this variety than grown at home.

To illustrate the relative importance of the industry in these respective countries, the following data for 1956 is presented:

<table>
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<th>Value of X-L-S Export</th>
<th>% of All X-L-S to All Exports</th>
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<tr>
<td>Production</td>
<td>out of production</td>
<td></td>
</tr>
<tr>
<td>Egypt (UAR)</td>
<td>178.1</td>
<td>46%</td>
</tr>
<tr>
<td>Peru</td>
<td>19.9</td>
<td>23%</td>
</tr>
<tr>
<td>Sudan</td>
<td>106.0</td>
<td>98%</td>
</tr>
<tr>
<td>United States</td>
<td>15.7</td>
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\(^{1}\)International Cotton Advisory Committee, Report on Extra-Long Staple Cotton, (Washington: May 1959), p. 6. The United States export reported above for 1956 is out of proportion to normal. Prior to 1956, U.S. exports were insignificant. The table also included Aden, a country of seventy-seven square miles in Southwest Arabia, a protectorate of Great Britain. In 1956, Aden grew extra-long staple cotton valued at $5,200,000, and all was exported.
From this tabulation it is apparent that extra-long staple cotton is a minor product in the United States compared to the production of the other countries growing this variety.

The United States Department of Agriculture sponsored the development of American-Egyptian cotton, first commercially grown in 1912, in response to the demands of American mills for a fiber competitive in quality and price with Egyptian cotton coming into this country at a rate in excess of 100,000 bales yearly at the start of the twentieth century. At that time Sea Island, the existing American extra-long staple, was highly priced in comparison with Egyptian cotton and much in demand from foreign mills. By 1919 Sea Island production was less than 7,000 bales and subsequently went out of production.

The inter-relation of Pima cotton and foreign extra-long staple varieties is so close that the full account of its history requires the relating of the experiences and extent of production in all extra-long staple cotton producing countries of the world. That is why it has been deemed pertinent to review the history of this industry in all nations where grown.

Accordingly, the subject is treated in two parts: (1) World Production of Extra-Long Staple Cottons; (2) The Pima Cotton Industry in the United States. This treatment
has compelled an extension of the original planned scope of the subject.

For example, the effect of the United States' tariff and import quota laws on nations growing extra-long staple cotton is treated in the chapters given over to the cotton history of the countries involved. As another example, the Pima variety, bred in the United States by Doctor T. H. Kearney and his staff, was used in certain varieties developed in Egypt and Peru. Thus the importance of including the histories of extra-long staple growth in all countries concerned is emphasized.

Acknowledgments

In the way of personal comment, this thesis would never have been written had it not been for the willing assistance of the professors in the Department of History of the University of Arizona, particularly Doctor Herman E. Bateman who has struggled through massive non-descript material never used and still kept a high level of courtesy while holding the finished product to reasonable size. The University of Arizona library staff were most helpful.

Officials in cotton associations, E. S. McSweeney of the Arizona Cotton Growers' Association and Robert Shuler of Arizona Cotton Planting Seed Distributors, rendered
courteous assistance. W. K. Shaw, Jr., and personnel of
the Shaw Cotton Company at Phoenix, answered every request
for information. In fact, I would give great credit to
the Shaw company for keeping extra-long staple cotton as
an important industry in the Salt River Valley.

Others, to whom I am indebted, include W. W. Pickrell
of Phoenix, who arranged a personal interview with Paul W.
Litchfield of the Goodyear Company and Kenneth E. McMicken
of Goodyear Farms, prime forces in the Pima cotton indus­
try from 1916. Pickrell's knowledge of old-time history
furnished good background material. Doctor Raymond E.
Seltzer in the Agricultural Economics Department of the
University of Arizona College of Agriculture took the time
to read most of the thesis and smoothed the copy in numer­
ous instances.

Personal friends have given inspiration and assistance
in buoying me up under the stress of extended labor. James
L. King, while enjoying a trip to the Caribbean with his
wife, stated my case to an official of the W. R. Grace
Company, which resulted in official data prepared by the
Peruvian government coming to me for use on the section on
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celebrate my attainment of a B.A. degree from the University
of Arizona in 1955, has been constantly applying the burr
on me to get this job done.
And, most of all, I must express gratitude for the patience and encouragement of Mary Donnelly McGowan, who wrote a daughter in Canada recently that she "was sick unto death" of the thesis project, nevertheless has been the guiding light that kept me on the job. Had she not maintained my confidence and given her encouragement, the task would have remained unfinished.

I must acknowledge and thank my son-in-law and daughter, Mr. and Mrs. Kenneth J. Bayly, for organizing a typing crew to get this into acceptable form. They were so anxious for the "old man" to get his M.A. that they bent supreme effort to getting the typing done in a brief time. A thanks, too, to the firm of Hirsch, Van Slyke & Richter, who made available four typewriters for the job, and to Mrs. Corrine Murphy, Mrs. Ted Offert, and Mrs. Allen McGinnis, and others who extended themselves to meet established deadlines.

If there is any accomplishment in this, the work was done by many.
PART I

WORLD PRODUCTION OF
EXTRA-LONG STAPLE COTTON
CHAPTER I

SEA ISLAND: FIRST EXTRA-LONG STAPLE COTTON

The United States is the world's greatest cotton-producing nation, a position it has consistently held since the early nineteenth century. At one time, 1892-93, this country grew three times as much cotton as the rest of the world combined.¹ Currently, that is since 1950, domestic production has been more than a third of the world supply. The United States is producing three times as much cotton as either India, or the Union of Soviet Socialist Republics, now vying for second place in world cotton volume.

In only four countries of the more than sixty growing some cotton is extra-long staple cotton produced in important volume. In this group the United States ranks last, behind Egypt, Sudan, and Peru. The United States has long been the prime source of raw material to the cotton mills of the world, but in the extra-long staple industry this country assumes the role of the importer. In the final decade of the nineteenth century (1890-1899) the United States produced 89,000,000 bales of all types of cotton, exported 60,967,000 bales, and imported 920,000 bales. The importations were

almost all extra-long staple cotton, shipped both direct from Egypt and through the Liverpool, England, market.

Sea Island, "the longest, finest, and most valuable cotton grown in the world,"\(^2\) was first grown in the United States in 1786 from seed received from the Bahama Islands, an area from which Columbus is reputed to have taken Sea Island samples to Europe in 1492. Although there are early references to cotton cultivation in Virginia, (1621), South Carolina, (1664), and Georgia, (1735), as long as England ruled the colonies cotton production was discouraged as an industry.\(^3\) Moreover, separating seed from lint was a slow and tedious task, a condition which was not relieved until after the invention of the saw cotton gin by Eli Whitney in 1793. Consequently, cotton as an industry did not attain its status of real importance in the United States until the nineteenth century.

**History of Growth: 1790-1919.**

The first successful crop of Sea Island was grown by William Elliott on Hilton Head Island, near Beaufort, South Carolina, in 1790. Although production of this extra-long


staple cotton extended later to interior regions of Georgia, and in the 1850's to Florida, the finest staples were always grown on the Sea Islands, James, Edisto, John and Wadmalaw.

South Carolina Sea Island cotton commanded some fantastic prices in its early history. In 1825 Kinsey Burden of that state sold sixty bales at $1.10 per pound and in another year received $1.25 a pound at a time when the price of upland was, nine and a quarter cents. Burden sold two bales of Sea Island in 1828 at two dollars a pound, an all-time record price ever paid for cotton.4

The Carolina Sea Island, comprising about thirty-five per cent of the cotton marketed at Charleston, was a very special product. The comparatively few growers exercised extreme care in seed selection, in growing, in clean picking and in assuring uniformity. The demand for this extra-fine and high-priced cotton was limited to the export trade. It was not baled as other cotton but put up in bags seven and a half feet long and two and a half feet in diameter. The bagged cotton, often with the grower's brand, was a Carolina Sea Island trade-mark. The normal prices ranged from thirty to sixty cents a pound. There was a fairly uniform demand for a few hundred bags with a staple of two inches and over for which a higher price, from fifty to eighty cents was paid.5


The Carolina Sea Island bags were filled by hand and pressed lightly in a hand-screw press after all stained and weak cotton had been removed. The interior Sea Island cotton of Georgia and Florida was packed with a steam press into bales weighing about 400 pounds each, of the same size and shape of the upland cotton bale. They were covered with heavy burlap and secured by sewing with strong cord instead of the steel bands used on upland bales.

In the years 1865 to 1890, Florida was the largest grower of Sea Island. Starting in 1890, Georgia took the lead and from 1893 to 1912, except in 1908, produced more than South Carolina and Florida together. Average total yearly crop, 1865 to 1912, was 55,407 bales of which about half went into the export trade. Though lagging in acreage and crop volume, the Carolina Sea Island was the backbone of the industry in that the interior growers were dependent upon Carolina seed to maintain quality. On the theory that seed "ran out," interior planters, crowded by upland, looked to the islands of James, Edisto, John, and Wadmalaw for fresh seed stock at least every third year.

In the first decade of the twentieth century, starting in 1902, the culture of Sea Island cotton was introduced into the West Indies. Expert Carolina growers were employed to teach farmers of St. Vincent, Antigua, Barbados and other islands how to grow Sea Island. Seed was provided from the best Carolina plantations. The project became so successful
that within five or six years the pressure of this new competition began to be felt.

The Carolina Sea Island growers decided to quit selling seed, not only to the West Indies but to Georgia and Florida planters and among themselves.

As a result there set in a general deterioration in the quality of Sea Island produced. Many farmers on the islands turned to upland short cotton. In 1913, James Island had more than 100 acres of upland; John and Wadmalaw islands had more short cotton than extra staple, and Edisto island had nearly as much. The nearness of upland on all sides contaminated the Sea Island at its fountainhead.\(^6\)

Hit by the boll weevil, Sea Island production was down to 6,916 bales in 1919; in 1924 only eleven bales of the once great Sea Island was grown. Many of the roller gins were transferred to the Southwest, the new home of the extra-long staple cotton industry in the United States.

**Strong Export Demand**

Sea Island cotton was a heavily-exported product. Prior to the American Civil War practically the entire crop was shipped to Europe. In the forty-eight years, 1865 to 1912, 47 per cent of the growth (yearly average of 26,392 bales)

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went into the export trade, 22,210 to Great Britain and 4,182 to the Continent, mostly France.

In 1870, only five per cent was consumed in the United States. Ten years later this had increased to thirty-five per cent, and by 1894 forty per cent was consumed domestically although the crop had increased 130 per cent in volume. In the first ten years of the twentieth century, 1900-1909, United States mills consumed 64.5 per cent of the total Sea Island crop, and in the next three years, 1910-1912, more than three-fourths of the total crop of the nation was used by domestic spinners. The increased home demand for Sea Island, from five per cent in 1870 to seventy-five per cent in 1910-12, was a part of the motor age launched in the first decade of the twentieth century. The strength of the extra-long staple was an essential to the high pressure cord tire in use until the 1920's.

Coincidentally, imports of Egyptian cotton continued to rise from 100,000 bales in 1900 to 183,786 bales in 1911 and 175,835 bales in 1912. After ten years of research and acclimatization, the first commercial American-Egyptian cotton crop was grown in 1912, a harvest of 375 bales from plantings

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7 Hammond, op. cit., p. 231.

8 Meadows, op. cit., appendix table 1, p. 16. Average crop, 1900-1909 was 91,119 bales; domestic consumption, 58,856 bales. Average crop, 1910-12, was 92,911 bales; domestic consumption, 69,891 bales.
by seventy-five farmers in the Salt River, Yuma, and Imperial valleys of the Southwest. After 1918, Sea Island ceased to be important in the extra-long staple market.

In the statistical history of the Sea Island cotton industry in the United States from 1865 to 1912, three states grew an average of 55,266 bales a year: Georgia, 25,678; Florida, 20,242; South Carolina, 9,346. The average price paid over this period was twenty-one cents per pound. The average upland price from 1880 to 1912, inclusive was 10.17 cents per pound. In the years 1902-1912, Sea Island prices averaged 24.41 cents per pound; upland, of comparative grades, 11,035 cents per pound. Egyptian cotton averaged 18.8 cents on the American market in these years. South Carolina Sea Island commanded a price of 29.07 cents, a premium over returns to the other extra-long staple growing states: Florida, 22.35 cents; Georgia, 21.8 cents per pound.

In the first thirteen years of the twentieth century, 1900-1912, Sea Island crops averaged 90,690 bales. In the

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9Ibid., table 1 shows a production of 6,699 bales of Sea Island by Texas and other: 3,974 in the period 1865-1878, 56 in 1880-82, and 2,669 in the years 1894-96. If these figures had been included in the yearly average production it would have added about 140 bales annually to the average.

10USDA Bureau of Agricultural Economics, Statistics on Cotton (Statistical Bulletin 99: June 1951) table 127, pp 150-51. Prices are spot prices at New York. Prices shown for years 1861-1879 are quoted in gold so currency prices from 1880 to 1912 are used in arriving at average spot price.
next decade, 1913-1922, the yearly average had dropped to 55,068. In the next ten years, 1923-1932, an average of only 117 bales were grown each year. There was an attempted re­vival in the years 1937 to 1941, and in this five-year period production averaged 3,792 bales annually. In 1942,918 bales were grown and in 1943, 374. In the next four years thirty-nine bales was the highest volume and since 1949 no production of Sea Island is recorded.

Sea Island cotton is still produced in limited quanti­ties in Puerto Rico and on some of the islands of the British West Indies. Expansion is restricted in these areas because of limited acreage on these small islands and the need for available lands to produce food crops.

Upland Sold as Sea Island

The boll weevil had reduced the yearly production of Sea Island cotton in the United States from 92,619 bales in 1917 to 6,916 bales in 1919, and it appeared that the industry was doomed. Omitting the year 1927 when 179 bales were grown, the Sea Island crop from 1924 to 1934 averaged less than eighteen bales a year, from a low of seven in 1929 to a high of twenty-six in 1931.

The Bureau of Plant Industry of the United States Department of Agriculture developed, starting in 1912, an extra-long staple upland variety, called the Meade, pro­ducing a fiber mostly 1-5/8 inches but varying from 1-7/16
to 1-3/4 inches of fine texture similar to the Sea Island. So closely did the Meade fiber resemble the Sea Island that only experts could distinguish between the two. The Meade matured two to three weeks earlier, gave a higher production of both lint and seed, and could be picked more easily than the Sea Island. Experimental production started in 1916 and department officials looked to Meade as a possible substitute for the rapidly diminishing Sea Island cotton. Three generations of progenies had been grown and a superior stock separated before the unexpected death of Meade in 1916.  

The Meade variety was originally bred in northeastern Texas, at Clarksville, but proved to be well-adapted to the districts of southern Georgia and northern Florida where the Sea Island was grown. In 1916 small experimental plantings of the Meade cotton were made on the Sea Islands of South Carolina and the following year extended to Sea Island districts of Georgia. There were reports of individual successes with Meade, resulting in numerous requests to the department of agriculture for seed of the new variety.


12G. S. Meloy and C. B. Boyle, Meade Cotton, An Upland Long Staple Replacing Sea Island (USDA Bulletin 1030: March 10, 1922), p. 3. Mr. Meade was among the scientists who worked on American-Egyptian cotton at Yuma and Sacaton, Arizona, in 1903.
In 1918 sufficient seed had been developed to permit the department to make arrangements with selected growers to plant from five to seventy-five acres under an agreement aimed to prevent crossing with other varieties. The department was to receive one-third of the seed grown while the farmer retained the lint and the remaining two-thirds of the seed for his own use or to sell to neighbors. This was an effort to establish one variety community production of Meade cotton and maintain adequate supplies of seed. An inspection of these plantings in June revealed that the precautions had not been too well observed and as a consequence not more than 250 acres of the Meade plantings of 1918 had been free of contamination with other varieties. Meade growers were unable to get the cooperation of ginners, a condition which restricted the supply of seed for 1919 plantings.

About 3,000 acres were planted to Meade cotton in 1919, of which not more than 500 acres were isolated sufficiently

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13 Ibid., pp 6-7. Meade plantings were to be in isolated fields at least 300 yards from any other kind of cotton; or if this was not practicable, fifty or sixty rows of corn was to be grown between the Meade plantings and that of any other variety.

14 Ibid., pp 7-8. Only the early Meade crops received careful attention before the Sea Island harvest came to the gins. To assure seed purity gins would have to be thoroughly cleaned before Meade cotton could be ginned after Sea Island. Sea Island ginners objected to Meade cotton because of the large size of the seed which would not pass through the grids as rapidly as Sea Island, thus slowing down the process.
to avoid possible hybridization with other varieties planted in nearby fields.

In 1920 many bales of Meade were marketed as Sea Island and accepted on the market without question, whereas the total production of Meade approximated 2,000 bales, not including what sold as Sea Island. Spinning tests showed the practicability of using Meade cotton in place of the Sea Island in the manufacture of thread and fibers of special quality. Since the good Meade cotton was sold as Sea Island, Meade as a variety never gained the reputation it merited. In the rush of expansion, there was much planting of mixed seed and the inevitable production of irregular fiber, so sharply discounted in the market, that even good Meade became difficult to sell.

**Failed as Sea Island Substitute**

Consequently, the early successes of the Meade variety were turned to failures, almost before it had been able to prove its worth. Two scientists of the federal department of agriculture laid the demise of the Meade variety to these factors:

The failure to establish the production of Meade cotton as a substitute for Sea Island was largely the result of the persistent planting of Sea Island and short cotton in the same localities with the Meade. The growers did not appreciate the necessity of complete isolation of the fields and separate ginning of the cotton to maintain the purity of the seed stocks and uniformity of the fiber. Careless ginning methods, with consequent mixing of the seed and the crossing of the plants in the field, made it
impossible to secure stocks of seed and maintain the uniformity of the fiber required by manufacturers. The subsequent marketing of mixed irregular fiber under the name of Meade cotton brought the variety into disrepute among the spinners as well as among the buyers and so increased the difficulties of marketing that farmers were discouraged from planting it.15

Both Sea Island and the Meade cotton continued to be grown in limited quantities, but seed problems and the ever-encroachment of short staple into the extra-long staple areas throttled attempts at expansion or revival. Since the extra-long staple requires roller gin equipment, the maintenance of two sets of gin equipment was added expense. Many of the roller gins in the former Sea Island districts were dismantled and some moved to Arizona to care for the extra-long staple crops there.16

British Effort to Grow Extra-Staple
In Mississippi Delta

In the first decade of the twentieth century, Hindi, a "weed" cotton of short and weak fibers, had seriously contaminated the high-quality Egyptian extra-long staple crop, and it appeared that a series of lean years were in prospect. This concerned the Fine Cotton Spinners' and Doublers' Association, Ltd., of Manchester, England, a combine of some

16 Ibid., p. 18.
fifty-odd cotton milling companies. In 1911 the directors of the association approved the purchase of more than 30,000 acres in the Mississippi delta, an area located between the Mississippi and Yazoo rivers, about 140 miles south of Memphis and a long distance from the actual delta of the Mississippi river.

The initial land investment was three million dollars at ninety-five dollars an acre and an additional million and a half dollars for more land, clearing, draining, building tenants' cabins and general improvements. The total holdings reached 45,000 acres of cotton land, 32,600 acres all in one block, and operated by one farm manager.

The capitalization of the entire project was $7,400,000 including stocks and bonds. The parent company formed in 1911 was capitalized with a bond issue of $3,000,000 and a stock issue of $3,000,000. In 1914 the same group organized the Delta Farms Company, issuing $400,000 in bonds and $500,000 in stock, to buy 8,800 acres at Deeson, Mississippi.

A third unit, the Empire Plantation Company, with a


18Barton W. Currie, "Sky-High Cotton", Country Gentleman, February 10, 1917, p. 242. In 1929 when the Roosevelt irrigation district, between the Aqua Fria and Hassayampa rivers in Maricopa County, opened, Arizona boasted of 37,000 acres of solid cotton extending twenty-four miles, two to four miles wide; 32,000 acres of Acala and 5,000 Pima. Ownership, however, was divided among many landowners. (Producer, September 15, 1929, p. 1).
stock and bond issue of $250,000 each, acquired a 5,500 acre plantation at Estill, Mississippi. The 45,000 acre project had a frontage of twenty-five miles on the river.

In 1919, the two land-holding companies and the one operating company were merged under the name of Delta & Pine Land Company, its present title. Because Mississippi law did not allow agricultural projects to hold more than 10,000 acres, except corporations chartered between 1886 and 1889, the name was assimilated by the purchase of a charter issued to a company of that name in 1886 and the name retained.\(^{19}\)

The company maintained headquarters, oil mill, compressor, and gin at Scott, with gin and compress at Lamont. As of 1917 the operation was tied close to the British owners:

The cotton is grown on the company's land; it is ginned on the company's land; every last by-product is conserved there, and finally the compressed fiber is billed direct to the Fine Cotton Spinners and Doublers Association in Manchester, England— in another guise the company itself. Virtually the Company is both producer and consumer, for it sells its cotton to itself and spins the cotton fabric in its own mills.\(^{20}\)

Shortly after the company acquired its possessions in the Mississippi delta, it learned, as early experiments had proven, that extra-long staple cotton could not be successfully grown in the area, primarily because the growing season was too short and the crop matured too late in the year.

\(^{19}\) *Fortune*, op. cit., p. 129.

\(^{20}\) *Country Gentleman*, op. cit., p. 11.
to be harvested with profit. The delta is now a prime source of the ordinary-long staple. During the six year period, 1928-1933, the "Mississippi Delta" region produced nearly eighty-two per cent of the ordinary-long staple crop of the United States.21

Regardless of the British ownership of the Delta & Pine Land Company, it has access to all the benefits of the United States government programs. In April 1936 Senator Arthur Vandenberg in a speech on the floor of the Senate accused the New Deal of paying its fourth-largest benefits to a company owned by subjects of the British Empire.22

In January 1960 Senator John J. Williams, in an attack on the government's price support program for cotton, identified the Delta & Pine Land Company as British-owned and the recipient of a 1958 crop loan of $1,216,299.80, the second largest loan made. Williams said the government must take over much of the cotton on which it has made loans and had lost $800,000,000 in taxpayers' money in its export program, tied to the loans, in three years.23

21Tariff Commission, 1935, op. cit., p. 16. Because the delta region growing cotton is not the true Mississippi delta the Commission puts these words in quotes.

22Fortune, op. cit., p. 125.

23"Big Cotton Loans Lashed in the Senate", Arizona Star, January 14, 1960, p. 4D.
Deltapine Popular In Imperial Valley

The long arm of the British company has recently reached into Arizona, starting a controversy among growers as to whether Deltapine, a variety developed by the Delta & Pine Land Company, should be permitted to compete with the Arizona ordinary-long staples which have won Arizona "its enviable reputation". Imperial County in California, except the Bard and Coachella Valleys, has gone to the Deltapine variety, attracted by high yields. Eighty-eight percent of the 122,100 bales ginned in the Imperial Valley in 1959 was Deltapine.

Cotton growers have become conscious of the importance of maintaining seed purity by restricting plantings of several varieties in the same area. In 1925 the California legislature established a one-variety community in Riverside and counties of the San Joaquin Valley, permitting only a single type and variety to be planted in these areas. The 1960

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25 "Snowballs at Brawley", Arizona Farmer-Ranchman, December 19, 1959, p. 34. This is a report of a visit to California cotton fields by Arizona cotton officials and growers. In 1957, almost one-third (31%) of U. S. cotton acreage was planted to Deltapine, predominately in Mississippi Arkansas, Louisiana, Tennessee and Texas. The Acala varieties were favored in the irrigated areas of the Southwest and were second in national use, providing over one-fifth (21%) of all U. S. cotton acreage in 1957. Poehlman, Breeding Cotton, New York: Holt, 1959, table 37, p. 309/
session of the Arizona Legislature was urged by the Arizona Cotton Growers' Association to set up one-variety areas in their State. Almost 5,000 acres of Deltapine were planted in Arizona in 1958-59, outyielding the Arizona Acala 44. But cotton brokers insist the Acala is drawing five to ten dollars more per bale because of its higher breaking strength and are united in the belief that adherence to the one variety is essential to the continued success of the ordinary-long staple industry in Arizona.\textsuperscript{26}

The history of extra-long staples has been deterioration of its product with the advent of new varieties. Sea Island and the Meade upland fell victim to this as much as to other factors. The Delta & Pine Land Company did not succeed in establishing an extra-long staple crop in the Mississippi delta but it has developed a place of great importance in the ordinary-long staple cotton industry.

MOST OF WORLD'S EXTRA-LONG STAPLE COTTON GROWN IN NILE VALLEY
In 1955-56: Egypt Produced 50% and Sudan 39% of World Crop
One-Half Produced in Nile Delta

EXTRA-LONG STAPLE
COTTON GROWTH
IN EGYPT (UAR)
1951-1960

<table>
<thead>
<tr>
<th>Season</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>Acreage</td>
<td></td>
</tr>
<tr>
<td>1951-52</td>
<td>895</td>
</tr>
<tr>
<td>1952-53</td>
<td>1,001</td>
</tr>
<tr>
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<td>510</td>
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<td>1954-55</td>
<td>618</td>
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<td>871</td>
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<td>1956-57</td>
<td>797</td>
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<td>1957-58</td>
<td>960</td>
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<td>1958-59</td>
<td>1,177</td>
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<tr>
<td>1959-60</td>
<td>907</td>
</tr>
<tr>
<td>Yield per acre</td>
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</tr>
<tr>
<td>1951-52</td>
<td>344</td>
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<td>368</td>
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<tr>
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<td>422</td>
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<tr>
<td>1958-59</td>
<td>478</td>
</tr>
<tr>
<td>1959-60</td>
<td>414</td>
</tr>
</tbody>
</table>

Production
1951-52 | 646 |
1952-53 | 924 |
1953-54 | 507 |
1954-55 | 531 |
1955-56 | 552 |
1956-57 | 614 |
1957-58 | 847 |
1958-59 | 935 |


EXTRA-LONG STAPLE
COTTON DATA FOR
SUDAN--1950-59

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<thead>
<tr>
<th>Item</th>
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<td>358</td>
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<td>1957-58</td>
<td>147</td>
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<tr>
<td>1958-59</td>
<td>410</td>
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<tr>
<td>Production</td>
<td></td>
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<tr>
<td>1950-51</td>
<td>385</td>
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<tr>
<td>1951-52</td>
<td>191</td>
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<td>557</td>
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<tr>
<td>1957-58</td>
<td>159</td>
</tr>
<tr>
<td>1958-59</td>
<td>537</td>
</tr>
</tbody>
</table>

1/ Acreage limitation of Ministry of Agriculture.
2/ Trade estimate based on acreage figures given.
CHAPTER II

EGYPTIAN EXTRA-LONG STAPLE COTTON

The cotton mills of Manchester and Lancashire and other textile areas of England have been the world's greatest consumers of cotton since the industrial revolution and a series of eighteenth-century inventions implemented a transition from wool to cotton. India, which had monopolized the cotton industry for 3000 years, from 1500 B.C. to 1500 A.D., lost most of her trade to English machine-made cottons, and by 1860 imported nearly 242 million pounds of English yarns and cotton goods. From 1840 to the time of the Civil War the American South supplied Great Britain with four-fifths of all her cotton imports. England's dependence on a single American crop was alarming to the textile industry.¹

The United Kingdom lent aid to Egypt to expand its cotton plantings during the American Civil War and assured the growers in the delta of the Nile good returns and a steady market, particularly when it was found that Egyptians grew the long-staple with special qualities of fineness and strength. From then on, Egypt has maintained a high rank in the industry important far beyond the volume of its production.

¹F. L. Owsley, King Cotton Diplomacy (Chicago University: 1931), pp3; 10.
Most cotton-consuming countries of the world buy Egyptian cotton.

**Egypt: Foremost Producers of World's Extra-Long Staple Cotton**

Thirty to forty per cent of the cotton crop of Egypt is extra-long staple (over 1-3/8 inches); 20 per cent is medium-long staple (1-1/4 to 1-3/8 inches), and the remaining 40 per cent to 50 per cent of the crop is made up of ordinary-long staples (1-1/8 to 1-3/16 inches). Almost the entire crop grown in the delta and the valley of the Nile qualifies as long-staple. Egypt produces about 65 per cent of the total world production of long-staple cottons. In the decade, 1947-1956, 36 per cent of Egypt's total crop (yearly average of 1,649,000 bales) was extra-long staple (yearly average of 595,600 bales).

During the same decade (1947-1956), the United States cotton crop averaged 13,960,500 bales of which 365,400 (2.6 per cent) was ordinary long-staple (1-1/8 to 1-3/8 inches), and the yearly average of extra-long staple (over 1-3/8 inches) was only 40,500 bales (.3 per cent).

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Egypt in the years 1955 and 1956 produced half of the world's extra-long staple cotton, Sudan grew thirty-nine per cent, with Peru ranking third with seven per cent, and the United States in last place with four per cent. Annual average bale production of extra staple for these countries for these two years was: Egypt, 583,000; Sudan, 442,500; Peru, 85,000; United States, 45,500.6

Cotton dominates the Egyptian economy, accounting for from eighty per cent to ninety per cent of the country's total exports.

It is, moreover, a prime factor in the political and military life of the nation.

Cotton was in the background of the British military occupation of Egypt in July 1882.7

In 1955 it was cotton that financed the purchase of arms and diverted Egyptian stocks to Communist countries, increasing the export to the "Iron-Curtain" countries from 102,000 bales in 1950 to 592,000 bales in 1955.8

The entire production of cotton in Egypt is dependent upon the Nile River, which sustains a cultivated area of more

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6International Cotton Advisory Committee, Cotton (Vol. 10, Nos. 9-10: April-May 1957), table 13, p. 22.
8Barlow, op. cit., table 2, p. 3.
than six million acres. The enormous Aswan Dam, completed in 1902, is at the base of Egypt's entire irrigation system. This dam was originally 6400 feet long, 130 feet high, and 98 feet thick. By raising it twenty-three feet in 1912 and as much again in 1933, collecting capacity was increased almost six times. The Nile area is divided into two parts: The delta, a triangular area irregularly extending to Alexandria, Port Said, and Cairo; and the Upper Valley, a narrow strip bordering the Nile from Cairo south to Aswan. The extra-long staple cotton is grown in the delta region.

Growers Prosper During United States Civil War

Ancient as is the history of Egypt, cotton has been grown extensively in the country only during the past century. Modern cotton production in Egypt was started in 1820 by Khedive Mohammed Ali (1769-1849) and a Franco-Swiss engineer, M. Jumel, who died in 1828. Jumel brought a cotton tree found in a garden near Cairo to the attention of the Khedive who fostered its commercial production and also caused various cottons, including Sea Island, to be introduced into Egypt from America. It is presumed that the Jumel cotton became mixed and crossed with Sea Island, giving rise to the Ashmouni stock from which all later Egyptian varieties were derived.  

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9 Gilbert R. Merrill, Alfred R. Macormac, and Herbert R. Mauersberger, op. cit., p. 147.

10 T. H. Kearney, Egyptian-Type Cottons: Their Origin and Characteristics, Beltsville, Maryland, September 1943, p. 1.
The outbreak of the Civil War in the United States gave real impetus to cotton production in Egypt. The country experienced an economic revolution in the years 1861 to 1866. One close student of cotton-growing in Egypt stated that had it not been for the American Civil War it would have taken Egyptian cotton a half-century to attain the position it had realized by 1865. With government encouragement, machinery for planting, irrigation, seeding, cleaning and packing was imported for Egyptian growers and cotton cultivation was expanded. The blockade of southern ports in the United States and the resulting cotton famine throughout Europe meant skyhigh prices and fabulous profits for all who could plant cotton. By 1864 prices on the Liverpool market were four times as high as in 1860. A cotton fever (somewhat similar to that experienced by Arizona growers in 1917-1920) overtook Egypt in these war years and the industry became so soundly established, with European markets assured and a quality product, that production continued higher in the post-war years.

In the decade prior to the American Civil War Egypt produced but a token average of 687 bales a year. By 1900 more than a million bales annually were being produced

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11Earle, op. cit., p. 522.
in the valley of the Nile river.\textsuperscript{12}

For seventy-five years, after the invention of the cotton gin by Eli Whitney in 1793, the United States was the only nation producing any significant quantity of cotton for export. Europe's textile industry was dependent on the American South for its supply of fiber material.

In the year 1900 Great Britain imported 3,558,000 bales of raw cotton valued on $200,000,000, apportioned: United States, 2,730,000 bales, valued at $147,000,000; Egypt, 624,000 bales, valued at $44,000,000; British East Indies, 72,000 bales valued at $3,387,000; Brazil, 60,000 bales, valued at $3,259,000; with Peru, Chile, and China sharing the remaining $2,354,000 imports.

Dividing the value of imports on the world's foremost cotton market at Liverpool as of the first year of the new century, 1900, the ratio percentagewise was: United States, \textsuperscript{12}

\begin{center}
\begin{tabular}{|c|c|}
\hline
YEAR & AVERAGE BALES \\
\hline
1850-1859 & 687 \\
1860-1869 & 250,743 \\
1870-1879 & 469,356 \\
1880-1889 & 576,133 \\
1890-1899 & 1,061,187 \\
1900-1909 & 1,234,774 \\
1910-1919 & 1,247,915 \\
1920-1929 & 1,370,365 \\
1930-1939 & 1,611,755 \\
1940-1947* & 1,343,252 \\
1948-1949# & 1,770,000 \\
\hline
\end{tabular}
\end{center}

\textsuperscript{12}Read P. Dunn, Jr., \textit{Cotton in Egypt} (National Cotton Council, Memphis, Tennessee: March 1949), table 7, p. 23, gives the average cotton production in Egypt by decades as follows:

\begin{center}
\begin{tabular}{|l|c|}
\hline
YEAR & AVERAGE BALES \\
\hline
1850-1859 & 687 \\
1860-1869 & 250,743 \\
1870-1879 & 469,356 \\
1880-1889 & 576,133 \\
1890-1899 & 1,061,187 \\
1900-1909 & 1,234,774 \\
1910-1919 & 1,247,915 \\
1920-1929 & 1,370,365 \\
1930-1939 & 1,611,755 \\
1940-1947* & 1,343,252 \\
1948-1949# & 1,770,000 \\
\hline
\end{tabular}
\end{center}

\textsuperscript{*}Seven-year average
\textsuperscript{#}Estimate. (Source: Ministry of Agriculture, Egypt, April, 1948)
73.5%; Egypt, 22%; British East Indies (mostly from Madras), 1.7%; Brazil, 1.6%; other 1.2%. 13

Origins of United States Importation of Egyptian Cotton

The first consignment of Egyptian cotton coming directly to the United States was 349 bales received in 1884. However, prior to 1884 American mills were buying Egyptian cotton on the Liverpool market and until 1891 there was more cotton imported from the United Kingdom than direct from Egypt. In 1896, the United States imported 110,700 bales of cotton of which 87,150 bales were received directly from Egypt and 19,060 from Liverpool, which authoritative sources affirmed was mostly Egyptian cotton. The 1896 imports of the Nile product were at least 100,000 bales.

Included in the 1896 cotton imports by United States mills were 3,322 bales from Peru and 1,168 from other countries. As early as 1875 United States mills bought 1,777 bales of cotton at Liverpool, probably Egyptian Cotton. 14

After 1890, mills of the United States imported Egyptian cotton at an ever-increasing rate. The average yearly

13 Frank H. Hitchcock, Agricultural Imports of the United Kingdom, 1896-1900 (USDA Section of Foreign Markets Bulletin 26: 1902), pp 30-31. Figures given in pounds were reduced to 500 pound bales.

14 Frank H. Hitchcock, Exports of Cotton from Egypt (USDA Office of Experiment Stations Bulletin 42: 1897) pp 32-24. (Hitchcock was publisher of The Tucson Citizen from 1928 until his death in 1935).
importations direct from Egypt by five-year periods from 1890 to 1930 showed a steady climb: 15

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>YEARLY AVERAGE BALES IMPORTED</th>
<th>PERIOD</th>
<th>YEARLY AVERAGE BALES IMPORTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890-1894</td>
<td>30,143</td>
<td>1910-1914</td>
<td>158,050</td>
</tr>
<tr>
<td>1895-1899</td>
<td>74,600</td>
<td>1915-1919</td>
<td>247,865</td>
</tr>
<tr>
<td>1900-1904</td>
<td>108,970</td>
<td>1920-1924</td>
<td>200,939</td>
</tr>
<tr>
<td>1905-1909</td>
<td>126,371</td>
<td>1925-1930</td>
<td>236,742</td>
</tr>
</tbody>
</table>

The highest importation for a single year was 485,000 bales received in 1919, which helped to send prices for the American-Egyptian Pima cotton into a disastrous decline after the record domestic crop of 1920. The depression decade of the 1930's witnessed a further drop in Egyptian cotton imports to a yearly average of 66,680 bales. 16 The United States tariff act of 1930 imposed a seven-cent duty on imports of cotton having a staple length of 1-1/8 inches and longer which tended to reduce the Egyptian imports.

Application of Import Quotas After 1939

Section 22 of the Agricultural Administration Act of

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1938 provided that imports of cotton could be restricted by the President of the United States upon recommendation of the tariff commission when such restrictions were needed to protect the agricultural program of the government.

Import quotas on cotton first adopted in 1939 included all long staple cotton of 1-1/8 inches and longer and was set at approximately 95,000 bales of 500 pounds gross weight. Original quotas were established by countries and on that basis 95.2 per cent of the quota was allotted to Egypt and the Sudan, and 4.5 per cent to Peru; the small remainder (.3 per cent) was allotted to ten other occasional suppliers. In 1942 the sum of these quotas was made a global quota, eliminating the restrictive effect of applying individual quotas for each foreign-producing country. Not until 1958 were quotas subdivided for long and extra-long staple. In December 1940 extra-staple cotton 1-11/16 inches and over was excluded from the quota as a defense measure and remained in effect until reimposed by Congress on May 28, 1956.

A supplemental quota of 46,188 bales of cotton 1-3/8 inches and longer (extra-long staple) was authorized by the President in June 1947 upon the recommendation of the tariff commission. In July 1948, a supplemental quota was authorized permitting 36,000 additional bales to be imported in the following two months. On October 13, 1950, the regular quota for extra-staple cotton 1-3/8 to 1-11/16
inches was permitted to be exceeded by 15,000 bales.\textsuperscript{17} The increase was granted on the plea of mills because of the low extra-staple domestic crops of 1945-49.

\textbf{Reduction of United States Tariff Rates of 1930}

The import duty on cotton stapling 1-1/8 inches or longer, effective June 18, 1930, was reduced from seven cents per pound to three and a half cents per pound in 1942 under a trade concession agreement with Peru and subsequently extended to all countries.

Effective October 7, 1951, pursuant to a concession granted in a general agreement on tariffs and trade at Torquay, England, the rate on cotton stapling 1-11/16 inches or over was still further reduced to one and three-quarters cents a pound and the rate on other long-staple cotton (1-1/8 to 1-11/16 inches in length) was bound against increase at three and a half cents a pound. These are the current tariff rates on long and extra-long staple cottons.\textsuperscript{18}

With tariff rates lowered and import quotas amended to permit some extra-long staple cotton free entry and

\textsuperscript{17}Doris Detre Rafler, \textit{The Extra-Long Staple Cotton Situation} (USDA Agricultural Marketing Service Statistical Bulletin 234: July 1958), table 24, p. 35. Only about one-third of the supplementary quota authorized in September 1948 was filled due to a sharp price rise for Egyptian Karnak at that time.

\textsuperscript{18}United States Tariff Commission, July 1959, \textit{op. cit.}, p. 5.
supplementary quotas authorized in the decade of 1940, the average annual importation of extra-long staple in the period 1940-1949 was 113,130 bales, a yearly increase of 46,450 bales over the average of the preceding decade, 1930-39 (66,680 bales). The average annual imports from extra-long staple growing countries, 1940-1949, was: Egypt, 94,220 bales; Peru, 15,050 bales; Sudan, 2,020 bales.

The heaviest imports of the extra-staple came in the four years 1946-49 (a yearly average of 137,800 bales), a period when the production of domestic American-Egyptian was at an all-time low average of 2,750 bales a year. Two supplemental import quotas totaling 82,188 bales were authorized at the request of United States mills in 1947 and 1948 and a third for 15,000 bales on October 12, 1950, to compensate for the extremely low volume of domestic extra-staple cotton produced in the year 1944-1949.

In the decade 1950-1959 extra-long staple imports kept within the limits of the established quotas. There were two supplemental quotas authorized: October 9, 1950, and July 4, 1951, each for the importation of 3,000 bales of Tanguis (not an extra-staple) from Peru.

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20 Ibid., table 107, p. 128.

21 Only about one-third of the excess quota authorized in 1948 was filled as explained in fn 25.
On July 7, 1958, the authorized quota was subdivided providing that not more than 79,181 bales (39,590,778 pounds) shall consist of extra-long staple of 1-3/8 inches or more and not more than 12,131 bales (6,065,642 pounds) shall consist of ordinary long staple 1-1/8 inches or more but less than 1-3/8 inches. Of the ordinary long staple, not more than 3,000 bales (1,500,000 pounds) shall consist of harsh, rough cotton 1-5/32 inches or more (Tanguis cotton).22

For the nine year period, 1950-1958, the importation of extra-long staple averaged 80,044 bales a year; the five-years (1954-58), average dropped to 68,900 bales.23

In the years 1951 and 1952 the Commodity Credit Corporation operated purchase programs to stimulate production for stockpiling purposes. Under this program, of about 280,000 bales of extra-long staple cotton purchased, 182,600 bales of Egyptian and Sudanese cotton were bought for stockpiling.24

22The July 1958 tariff commission order subdividing the quota by staple lengths--extra-long and ordinary-long--was the result of Mexico filling more than half of 1957's total quota. In most years, imports of Mexican cotton under the long-staple quota was not significant, the previous high being 3,770 bales in 1952. In 1957, 49,108 bales of Mexican cotton was imported under the quota. As a consequent, Egyptian imports were held to 28,665 bales in 1957, the lowest on record since the early 1890's.


24Rafler, op. cit., p. 12
The 1930 tariff, the 1939 import quota system, and the 1951-52 stockpile purchase program of the United States were applied only to the ordinary-long and extra-long cottons, primarily the latter. The extra-long staple-growing countries --Egypt, Sudan, and Peru-- were the foremost countries involved.

**Important Egyptian Varieties**

The Ashmouni variety, which emerged about 1860 and was the progenitor of all of the later varieties, is still in production, not as an extra-staple but what the Egyptian would call a medium staple, from 1-1/8 to 1-1/4 inches in length. In the years 1955 and 1956, Ashmouni was used for a third of the nation's crop and two-thirds of its medium-long and long-staple acreage. Karnak and Menoufi, the two extra-long staple varieties currently produced, were planted to forty-six per cent of the total Egyptian acreage in these years.\(^\text{25}\)

The Mit Afifi variety originated about 1882 and gave rise to most of the later Egyptian and American-Egyptian varieties. Commercial production began in 1887 and continued until about 1927, although the total acreage had declined in 1921 to 2.5 per cent from the peak of seventy-seven per cent in 1906 when it was almost the only variety grown in the Nile delta, confining the Ashmouni to the upper Nile. The Mit Afifi grew a brown-colored fiber averaging 1-5/16 inches in length, was

\(^{25}\)Farid Mustapha, *op. cit.*., table 7, p. 11
strong and regular and ranked high among the commercial cottons of the world. Of the several Egyptian varieties used in experiments in the United States after 1900, Mit Afifi provided the parentage for the American-Egyptian Yuma (1908), the Pima (1910), and provided some strain in subsequent American extra-long staples.26

The principal Egyptian varieties following the Mit Afifi and the year in which commercial production began for each were: Abassi 1893, Yannovitch 1899, Nubari 1907, Sakellaridis or Sakel 1909, Assili 1910, Zagora (Ashmouni) 1916, Giza 2 1926, Giza 7 1930, Giza 19 1933, Wafeer (Giza 12) 1935, Malaki 1938, Karnak (Giza 29) 1939, and Menoufi (Giza 36) 1943. Giza is a suburb of Cairo where the ministry of agriculture does its cotton-breeding. Most recent varieties were first released under "giza" number and in some cases, as in Giza 7, no other name was substituted.27

The most important variety next to Mit Afifi, both to Egyptian growers and to breeders of American-Egyptian cotton, is the Sakel (Sakellaridis). Originated in 1906 and started in commercial production in 1909, Sakel reached its peak of production in 1922 when it constituted three-fourths of all the cotton acreage in Egypt. The fiber was light-cream in color, varied from 1-3/8 to 1-17/32 inches in staple length,

26Kearney, op. cit., pp 2-3.
27Ibid., pp 5-10.
was very silky, fine, and strong, and became one of the most valuable of the world's cottons, next to Sea Island. Production declined because of deterioration of seed stocks, its susceptibility to pink boll-worm damage and wilt, and low yield and lint percentage until, in 1936, Sakel made up only five per cent, and in 1942 only 1.7 per cent, of the Egyptian crop.

Seeds of the Sakel variety, procured in Egypt by the American Thread Company, were planted at the Sacaton experiment farm in central Arizona in 1914, and although the imported variety was found unsuitable for commercial use the plants were crossed with the American Pima in 1918, resulting in the SXP (Sakel crossed with Pima) which succeeded Pima as the dominant domestic variety from 1939 to 1948. SXP was first grown commercially in Arizona by W. K. Shaw, Jr., Boston cotton broker, in 1933 and 1934, and planting seed distributed to farmers in the Salt River valley in 1935. By 1940 the replacement of Pima by SXP was virtually complete.  

American Pima: Parent of Egyptian Maarad

The Maarad variety of Egyptian cotton, developed from American Pima seed brought from Arizona in 1918 and 1919, promised at one time to become one of the important Egyptian varieties.

28Ibid., p. 11.
In 1926, 4,500 feddans (one feddan equals 1.038 acres) of Maarad were cultivated in forty different localities in Lower Egypt. In 1927 seed was distributed to sixty-four cultivators on 110 farms and an area of 12,500 feddans sown. The yield of Maarad was higher by 315 pounds of seed cotton (100 pounds of lint) than the famed Sakel grown in the same districts. In addition, it had a longer lint length, gave a higher ginning return, and showed less damage from the pink boll-worm.

In a three-year test, Maarad showed higher yields over the best Sakel: 20% in 1925, 39% in 1926, and 34% in 1927.

Victor M. Mosseri, closely identified with the Maarad variety, told the International Cotton Congress held in Egypt in 1927 "that the greatest advantage of Maarad would be to solve the Egyptian cotton problem in supplying simultaneously quality and quantity".

Dr. Lawrence Ball, well-known cotton expert, said in 1928 at a Zurich cotton conference "that Maarad is bound to spread rapidly on account of the yield". By 1942, Maarad production was 26,207 bales, 3.2 per cent of Egypt's total cotton crop. In spite of its high yield and greater wilt-resistance, Maarad failed to expand into an important Egyptian variety.


30 Kearney, op. cit., p. 10.
Soviet-Egyptian Arms Deal, Suez Invasion Linked to Cotton

Cotton, constituting eighty per cent to ninety per cent of Egypt's export trade, earns the greatest amount of foreign exchange for Egypt and therefore is most important in the country's economic and political life.

In 1955 Egypt made an arms deal with Czechoslovakia and in settlement mortgaged her cotton to Communist countries for several years to buy guns and airplanes. As a retaliatory move, on the charge that the Soviet-Egyptian arms deal had weakened Egypt's credit, the United States and Great Britain withdrew offers to make funds available to Egypt to finance the initial stages of the proposed high dam at Aswan, about five miles upstream from the present Aswan dam.\(^{31}\)

The withdrawal of credit was announced July 17, 1956.\(^{32}\) Nine days later President Gamel Abdel Nasser seized the Suez

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\(^{31}\) USDA Foreign Agricultural Service, Foreign Agriculture, January 1956, p. 9. The United States had offered $56 million and Great Britain $14 million with implied offers bringing the combined total to $200 million subject to legislative approval for the additional sums. The World Bank was expected to make available another $200 million or so. Total estimated expenditure was $1.3 billion over a twenty-year period.

\(^{32}\) Marquis Child, national syndicated columnist, in an address at the Tucson Sunday Evening Forum on October 26, 1958, blamed the American cotton interests for the abrupt withdrawal of proffered credit, stating "they were breathing down Secretary of State Dulles' neck, urging him not to put American dollars into a program to increase Egypt's cotton production".--Arizona Star, October 27, 1958, p. 2-A.
Canal, saying he would use the canal revenue to build the new Aswan dam. 33

On October 29, 1956, Great Britain, France, and Israel sent forces to the Canal Zone to recover the waterway, a move lacking support from the United States. The invasion succeeded but it was a Pyrrhic victory. The Egyptians sunk so many vessels in the canal that it was useless for months. The invading forces were withdrawn and a United Nations contingent has since patrolled the area to maintain peace.

Egypt retained control of the Suez, the Soviet Union offered $93 million to pay for the initial costs to get the high dam under construction, sent technicians to Aswan to supervise the preliminaries, and received the thanks of President Nasser at the start of the construction on January 9, 1960.

When completed the high dam will be two and six-tenths miles long and 436 feet high. Water flowing through the power turbines will produce ten billion kilowatt hours of

33Columbia Encyclopedia (New York: 1950), p. 1912 states Suez was constructed during the years 1859-69. Great Britain acquired control by purchasing the interests of the Egyptian kedive in 1875. Management, prior to seizure by Nasser, was in the hands of the Suez Canal Company, the stock of which was owned by various European countries. Great Britain was the guarantor of the neutrality and the accessibility to merchant and naval vessels in peace and war. It was estimated in 1950 that half the commerce between Europe and the Far East passed through the canal, in most years as many as 6,000 ships making the transit.
electricity a year to help industrialize Egypt.  

The chain of events involving Egypt and its cotton from the 1955 Egyptian-Soviet arms deal to the eventual launching of the high dam at Aswan in 1960 was reflected in a stimulation of production and the export of American-Egyptian cotton to fill gaps both in the domestic and foreign supplies. Egyptian exports to communist countries rose from 243,000 bales in 1954-55 to 592,000 bales in 1955-56. In 1955, 20,500 bales of American-Egyptian cotton went into the export trade which is more than the total export of the previous thirty-five years. In 1956, 57,900 bales of extra-long staple Pima was exported.

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34 Foreign Agriculture (USDA Foreign Agricultural Service) January 1956, p. 9, states that the high dam at Aswan will be the world's tallest rock-fill structure, will create a reservoir area three times larger than Hoover dam's Lake Mead, will make a great lake five to ten miles wide and 400 miles long, and will hold 110 million acre-feet of water. Each year for twenty years, as the high dam fills its reservoir, 100,000 new acres can be brought under cultivation, adding to the country's present six million arable acres. It will take ten years to complete the dam itself, a power plant, and a 500-ton fertilizer plant. Irrigation canals and laterals with associated facilities, will take another ten years to complete. The cost of the dam itself is estimated at $600 million; the cost of the power and fertilizer installations and the irrigation facilities at $700 million; total expenditures over twenty years estimated at $1.3 billion. Preliminary surveys, including an aerial survey made in 1953 financed by American technical assistance, indicate that the project will speedily pay for itself, estimating an increased national income from agriculture alone at $500 million a year.

Egypt's 1956-57 import quota remained unfilled by one-half. Not since 1944-45, when ninety-four per cent of the quota was filled, had less than the full quota been imported. When all entries had been charged against the 1956-57 quota, the equivalent of 45,247 bales of the extra-long staple quota remained unfilled.

In mid-1957, the Office of Defense Mobilization found there was no longer any need for stockpiling extra-long staple cotton. Accordingly, 45,247 bales of Egyptian cotton in the national strategic materials stockpile bought in the 1951 and 1952 purchase programs of the Commodity Credit Corporation was charged to the 1956-57 quota, making this amount eligible for future sale to domestic mills.

In August 1957, 50,000 bales of American-Egyptian cotton was released from the United States strategic stockpile, leaving 219,000 bales of which 170,000 bales is foreign cotton. Imported cotton in the stockpile cannot be authorized for domestic use without being charged against the import quota. 36

The 1957-58 import quota, set at 91,313 bales, applicable to cottons stapling 1-1/8 inches or more, was largely filled with Mexican long staple upland, holding the import of extra-long staple from Egypt to 28,665 bales for the year.

This resulted in the subdivision of the quota into long and extra-long staples, effective August 1, 1958. The 1959 quota of 79,182 bales of extra-long staple was filled on the opening day, Egypt and Sudan supplying 57,146 bales and Peru 22,036 bales. 37

**Egyptian Crises Benefit Pima Cotton Industry**

The current decade, 1950-1959, has been the most consistent period of stability and progress the American-Egyptian industry has experienced since the first crop of 1912. 38 The development of the high yielding and high quality Pima S-1, generally available to growers since 1954, and the organization of the SuPima Corporation of America in 1954 to promote extra-long staple consumption through promotion, research, and national consumer advertising have made great contributions to placing the industry on a sound economic basis. The Egyptian diversion of its cotton to national diplomacy has accentuated the importance of maintaining a domestic extra-long staple cotton industry.

37Ibid., table 1b, p. 44. Mexican long staple cotton imported under the 1957-58 quota totalled 49,108 bales, almost fifty-four per cent of the total quota for the year.

38USDA Agricultural Marketing Service, The Cotton Situation (CS-169) April 2, 1957, p. 16, states: "The consumption and export of domestically grown extra-long staple in 1956-57 are larger than at any time since records began in 1919". The USDA marketing service (CS-173, November 20, 1957, p. 30) says the disappearance of 167,000 bales of extra-long staple including the record export of 58,000 bales of Pima in the 1956-57 marketing year was in part due to the Suez crisis.
The expansion of Egypt's cultivated area by one-third in the next twenty years is not expected to make more cotton available for export. An increase in population from some twenty-two million to over thirty million in the next twenty years, necessitating more food production, and the increased use of cotton in Egypt's domestic industry, part of a program in development, will proscribe any sharp rise in Egypt's cotton export availabilities.
The Arizona Historical Review (II-2, April 1929, 11) eulogized this subject after his death in these words: "The future history of Arizona will contain the name of no man who accomplished more in the development of our state during his years of activity than Dwight B. Heard." As early as 1918, he reported visiting mills where Pima cotton was being converted to fabrics for war needs. He wrote extensively about his trip to Sudan in 1925 to study extra-long staple cotton.

In 1951, King Feisal of Iraq made an inspection visit to the Salt River Valley. W. W. Pickrell, then serving as president of the Salt River Valley Project, was his official host and in the above picture is shown displaying Pima cotton to the late king, assassinated in July 1958. Pickrell was active in promoting the Pima industry in the valley. In 1944 he worked with Walter K. Shaw, Jr., Boston cotton broker, in developing seed for Peeble's Amsak variety.
CHAPTER III.

SUDANESE EXTRA-LONG STAPLE COTTON

Sudan as an independent nation came into being in 1956 after fifty-seven years of existence under the name of Anglo-Egyptian Sudan. On January 19, 1956, Sudan became the ninth member of the Arab League and on November 12, 1956, was admitted to the United Nations as a free and independent dominion.

British influence in Sudan dates back to 1869 when two of Her Majesty's generals undertook administration of the area. In 1899 an Anglo-Egyptian condominium was established over Sudan providing for joint administration by England and Egypt, an arrangement reaffirmed in 1936 by treaty. In October 1951 Egypt abrogated all agreements, claiming special rights for Farouk I, self-styled king of Egypt and Sudan, a claim not recognized by England. In 1953, Sudan was given self-government by Egypt and the right of self-determination after a transition period. After January 1, 1956, the name Sudan replaced the previous national title of Anglo-Egyptian Sudan.

Sudan became important in extra-long staple cotton production in the crop year of 1925-26 when 300,000 acres were brought into irrigation by the completion of the Makwar or Sennar Dam, dedicated in January 1925. Eighty-three thousand
and seventy-two acres of Sakel extra-staple cotton were planted and a harvest of 76,194 bales realized from an acreage-yield average of 459 pounds of lint. By 1950, 226,618 acres in the Gezira project, irrigated by the Sennar Dam, was planted to extra-long staple Sakel and a crop of 275,211 bales produced with an acre-yield of 648 pounds of lint. The 1956 harvest of 585,000 bales of extra-staple is the record high.

Sakel Cotton Major Product of Gezira Irrigation Project

The Makwar Dam, financed by $65 million Sudanese bonds guaranteed by the British government, provides the necessary water for the Gezira irrigation project, an area of about a million acres constituting a fifth of the five-million-acre plain lying between the White Nile and Blue Nile Rivers, with its apex at Khartoum, Sudan's capital. The dam is located 160 miles south of Khartoum on the Blue Nile, is about two miles long and has eighty deep sluice gates and 112 overflow spillways. Only half of the million acres in the Gezira plains are irrigated each year and under the Nile water agreement on 1929 water is available only part of the year, from the middle of July to the middle of January.


2Rafler, op. cit., table 27, p. 38.
Cultivation of cotton under the Gezira scheme is a three-way partnership:

(1) The tenants, of whom there are some 26,000, have a forty per cent share in the crop and full, tax-free rights to other crops. They provide the labor to grow the cotton and keep clean the minor watering channels.

(2) The government also has a forty per cent share, a large part of which goes to retire the debt on construction loans ($39,534,250 was allotted for the purpose up to 1942). The government share is used also to pay rent to owners of ground, the use of which was nationalized at the start of the plan. In recent years, sums have been expended for health and education in the Gezira and for the development of agriculture in other parts of the Sudan.

(3) The Sudan Gezira board, the public-utility successor to the private cotton companies managing the project prior to 1950, receives a twenty per cent share in the crop, for which it supplies general administration, including maintenance of minor canals, providing the seed, supporting some research, and arranging the ginning, marketing, and transportation of the crop. The board also gives one-tenth of its income up to a maximum of $717,500 to a "social development fund" and if its portion of more than a certain sum, this goes to a reserve fund. The partners jointly bear the cost of manuring, cleaning foul land, spraying DDT, packing the cotton, ginning, transport to Port Sudan, export and other marketing expense.
Cotton and cottonseed from the Gezira make up about three-fifths of the country's total export by value and in recent years has provided more than half of the income of the Sudan government. All of the cotton grown in the Sudan is of the Egyptian types; in the first years of the decade 1950-59, forty-five per cent of the crop was in the Sakel extra-long staple.

Individual holdings in the Gezira varies from 31.1 to 41.5 acres, with one-third in cotton each year. An eight-course rotation is followed during which cotton is planted in only two of the years, the land left in fallow four years, and other crops tilled the other two years. Fallow before planting cotton permits proper preparation of the land and fallow after the cotton crop enables the clean-up of stalks and ratoons and some control of diseases and insects.  

Pima Cotton Grower Visit to Sudan in 1925

A comparison of the Sudan Sakel and the Arizona Pima cotton plants and the methods of growing in the Gezira was related by Dwight B. Heard, president of the Arizona Pima Cotton Growers Association in 1920-23, who visited the Nile

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3Hance, op. cit., pp 253-257. The author, an associate professor of economic geography in the graduate school of business, Columbia University, New York, visited Africa in 1952 under the auspices of the Carnegie Corporation. Heard, 1920-23 president of the Arizona Pima Cotton Growers, in the July 1926 Review of Reviews details the Sudanese operation much the same as Hance, except the three-way split in 1926 was: Government, 35%; labor, 40%; management, 25%.
cotton areas in November-December, 1925:

For nearly 100 miles, on fair dirt roads often along canal banks, we inspected the great Gezira project. . . . The cotton grown, Sakelaridis, is surprisingly like our Pima but does not exceed one and a half inches in staple length. Its blossom is like the Pima, but there the similarity ends. They plant with a stick, irrigate with a hoe and do not dare plow the land deep because it is so heavy and gummy. Shallow plowing, really harrowing, is done by steam cable plows. The blacks pick the cotton and stamp it, with weird songs, into sacks holding 400 pounds each. Two of these sacks are loaded on a camel and one sees long lines of these stately beasts stalking off to the ginneries. One of these gins, in four units with an aggregate of 320 stands, is one of the most up-to-date long-staple gins I have ever seen.4

Heard, writing in the July 1926 Review of Reviews of his African trip, asserted that the so-called Anglo-Egyptian Sudan was a "polite diplomatic myth," that in reality it was a British protectorate and it was the need for more long-staple cotton for the use of the Lancashire spinners that held England firmly in Sudan. Following the assassination of Sir Lee Stack, governor general of the Sudan, in Cairo in November 1924, Egyptian troops were removed from Sudan, immigration from Egypt prohibited, and Egyptian officials retired and replaced by Sudanese.

Included in the ultimatum delivered to the Egyptian

4Dwight B. Heard, An Arizona Traveler (Arizona Republic, Phoenix: December 11, 1926), p. 34. Heard noted that the control of the Nile waters was a controversial issue between Egypt and Sudan "in many respects similar to our Colorado control problem." p. 31.
prime minister by Lord Allenby at the head of 600 English lancers the day after the murder was this sentence: "According to its necessity the Sudanese government will increase the cultivated area in the Gezira from 300,000 feddans (one feddan is 1.038 acres) to an unlimited number." By previous agreement between Egypt and Sudan, acreage in the Gezira would not exceed 300,000 feddans without the consent of the Egyptian government. The cotton acreage, representing one-third of the Gezira annual plantings, was increased from 83,072 acres in 1925 to 198,817 in 1930, and held to a level of 220,000 to 226,000 acres from 1940 to 1950. In the first nine years of the 1950 decade, 1950-58, the Egyptian-type cotton grown in the Gezira has averaged 261,111 acres a year from which there has been an average annual production of 239,444 bales.

Increase of Pump Irrigation

Besides the large quantity of extra-long staple cotton produced in the Gezira (an average of 246,200 bales annually, 1954-1958), there is a considerable amount also grown in a

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6Hance, op. cit., table 1, p. 262.

number of pump irrigation projects scattered along the Nile, White Nile, and Blue Nile, mostly private but some under government operation. In the four years, 1950-1953, this averaged 51,250 bales a year, and increased to 122,000 bales annually, 1954-1958. In addition, an average of 25,555 bales of extra-long staple was produced annually under flood irrigation in the Tokar Delta on the Red Sea and the Gash Delta near Ethiopia.

The harvest of extra-long staple cotton on Sudan in the combined areas has brought the annual average crop in the years 1954-1958 to approximately 389,000 bales, a production that gives this country a clear title to the rank of second largest extra-staple producer in the world.

The comparatively rapid increase of extra-staple acreage in the Sudan in recent years, largely from pump and flood irrigation, has brought the problem of world over-production into focus. New acreage near the Gezira area, watered by the Managil extension timed for completion in 1962, could increase extra-long staple production in the Sudan by 200,000 bales if the present preference for the long-fiber cotton is continued by the government. There is a move for diversion to other crops as well as the shorter-staple cottons.

In 1958, 6,000 acres in the Gezira was planted to Acala

8Ibid.
9Ibid., p. 15.
4-42 seed imported from California. American cottons in pump irrigation areas have averaged 5,000 bales and in rain-grown sections 46,666 bales each year since 1950. More than ninety per cent of Sudan's cotton crop qualifies as extra-long staple cotton, however. 10

**Production Almost Solely For Export**

In the first five years of the Gezira project 1925-1929, the United Kingdom received 97.5 per cent of the Sudanese cotton exports. In the next two decades, 1930-49, India and Pakistan combined with Britain took most of the exports: 83.2 per cent in 1930-1939 and 98 per cent in 1940-1949. Starting in 1950, when control passed to the Sudanese government, the imports of Sudanese cotton dropped to 70.9 per cent in these countries, and for the first time France, Germany, and Italy appeared as consistent importers, taking a combined total of thirteen per cent for the period 1950-1955. 11

The largest imports of Sudanese cotton into the United States took place in the years 1941 and 1942, World War II years when a domestic incentive program was sponsored by the war mobilization board, and in 1947 when the American-Egyptian production was so low that the death knell of its

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11*Statistical Bulletin 99* (February 1957) and supplement (January 1958), table 172, p. 177.
existence was tolled by many in the industry. (Only 1,100 bales of Pima was grown in the three southwest states in 1947: 100 bales in Arizona, 900 bales in Texas, and 100 bales in New Mexico.)\textsuperscript{12} In these three years, (1941-1942-1947), United States imported 11.7 per cent of the total cotton exports from Sudan, and only 200 bales in one other year (1946) during 1940-1949.

Financed and directed by British spinners until 1950, imports of Sudanese cotton into the United States was insignificant, usually included with Egyptian imports in statistics. A total of 28,000 bales of Sudan's cotton came into the United States during 1950-56.

In 1956-57 ninety-eight per cent of all Sudan's cotton acreage was planted to extra-long staple cotton. This emphasizes the country's growing importance in the extra-long staple field. The Sennar Dam, completed in 1925, has increased extra-long staple cotton production from 20,000 bales to 557,000 bales in 1956-57, a record year. The 1956-57 Sudanese crop accounted for forty-one per cent of the world's total production of extra-long staple cotton.\textsuperscript{13} No other country has committed such a large percentage of its economy to extra-long staple cotton growth.

\textsuperscript{12}Ibid., table 197, p. 204.

\textsuperscript{13}International Cotton Advisory Committee, \textit{op. cit.}, table 6, p. 10. The 1957-58 was down to 159,000 bales because of low acre yield of 147 pounds. The 1958-59 crop was up again to 537,000 bales on a yield of 410 pounds of lint to the acre.
Table 11. Production of cotton in Peru

<table>
<thead>
<tr>
<th>Season</th>
<th>Extra-long staples</th>
<th>Tanguis</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 bales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950-51</td>
<td>31.9</td>
<td>353.5</td>
<td>2.8</td>
<td>388.2</td>
</tr>
<tr>
<td>1951-52</td>
<td>27.6</td>
<td>386.9</td>
<td>3.8</td>
<td>418.3</td>
</tr>
<tr>
<td>1952-53</td>
<td>54.5</td>
<td>388.0</td>
<td>9.2</td>
<td>451.7</td>
</tr>
<tr>
<td>1953-54</td>
<td>45.6</td>
<td>425.7</td>
<td>11.0</td>
<td>482.3</td>
</tr>
<tr>
<td>1954-55</td>
<td>79.4</td>
<td>400.3</td>
<td>13.0</td>
<td>492.7</td>
</tr>
<tr>
<td>1955-56</td>
<td>70.7</td>
<td>410.3</td>
<td>12.6</td>
<td>493.6</td>
</tr>
<tr>
<td>1956-57</td>
<td>107.9</td>
<td>373.1</td>
<td>5.6</td>
<td>486.6</td>
</tr>
<tr>
<td>1957-58</td>
<td>107.5</td>
<td>386.5</td>
<td>6.0</td>
<td>500.0</td>
</tr>
<tr>
<td>1958-59</td>
<td>113.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Preliminary.

Extra-long staple cotton is grown in Peru in the area circled to the left of map. The valleys of Chira and Piura grow a high quality product under irrigation—most of which is exported.

Table 12. Production of extra-long staple cotton in Peru

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pima</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Area, 1,000 acres . . .</td>
<td>93.2</td>
<td>81.6</td>
<td>116.5</td>
<td>116.5</td>
<td>128.2</td>
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<tr>
<td>Yield, pounds per acre</td>
<td>364</td>
<td>365</td>
<td>372</td>
<td>367</td>
<td>356</td>
</tr>
<tr>
<td>Production, 1,000 bales</td>
<td>71.0</td>
<td>62.4</td>
<td>90.8</td>
<td>89.6</td>
<td>95.5</td>
</tr>
<tr>
<td>Karnak</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area, 1,000 acres . . .</td>
<td>11.7</td>
<td>11.7</td>
<td>23.3</td>
<td>23.3</td>
<td>25.6</td>
</tr>
<tr>
<td>Yield, pounds per acre</td>
<td>344</td>
<td>339</td>
<td>351</td>
<td>366</td>
<td>337</td>
</tr>
<tr>
<td>Production, 1,000 bales</td>
<td>8.4</td>
<td>8.3</td>
<td>17.1</td>
<td>17.9</td>
<td>18.0</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area, 1,000 acres . . .</td>
<td>104.9</td>
<td>93.3</td>
<td>139.8</td>
<td>139.8</td>
<td>153.8</td>
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<tr>
<td>Yield, pounds per acre</td>
<td>362</td>
<td>362</td>
<td>369</td>
<td>367</td>
<td>353</td>
</tr>
<tr>
<td>Production, 1,000 bales</td>
<td>79.4</td>
<td>70.7</td>
<td>107.9</td>
<td>107.5</td>
<td>113.5</td>
</tr>
</tbody>
</table>

From information supplied by Camara Algodonera del Peru. Original area figures in hectares rounded to nearest 5,000 hectares have been converted at 2.33 acres per hectare, the conversion unit used by the Camara.
CHAPTER IV.

PERUVIAN EXTRA-LONG STAPLE COTTON

There is evidence that cotton is indigenous to Peru; it seems to have been grown there from prehistoric times. The first Spanish conquistadores found the natives clothed in cotton. Mummies of very ancient date were found wrapped in materials of cotton. The culture of the white fabric was not a concern of the early conquerors, because they were interested in precious metals, as in other Spanish colonies. The agricultural wealth of the western hemisphere was initially ignored.

The first recorded export of cotton from Peru was 683 bales to Liverpool in 1862, indicating the stimulation of the industry from the American Civil War as in Egypt. By 1865, the exports had increased to 8,290 bales. From 1885 to 1892 the average export from Peru to Liverpool was 12,000 bales a year. The South American product was known in the trade as "rough Peruvian" and was used to mix with wool because it diminished the shrinkage inclination in goods in which used.¹ This is a quality of the present-day

Tanquis variety, now constituting more than three-fourths of the Peruvian crop.

Fourteen bales of Peruvian cotton were imported into the United States in 1885; by 1890 this had increased to 9,500 bales, and by 1895 imports had reached 24,000 bales. The peak import year for Peruvian cotton was 1919 when 63,400 bales came into the United States. This was the year Egypt poured 485,000 bales of cotton into the United States which took the props from under the Pima grown in the Southwest, bringing a disastrous plunge in price to the domestic crop after the record harvest of 1920.

Imports from Peru averaged 26,000 bales annually in the years 1915-19, and in the next decade, 1920-29, 21,350 bales. After the 1930 tariff and in the years of depression, only an average of 2,180 bales a year was received in the 1930-39 period. World War II and the low Pima acreage of the late 1940's stimulated Peruvian imports to an annual average of 15,050 bales, 1940-1949. In the eight years, 1950-57, the yearly average has been 13,952 bales. This includes both Tanquis and extra long staple.

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2Ibid., p. 65.


Growth of Extra-Long Staple Cotton Doubled from 1951 to 1954

Tanquis cotton, and ordinary-long-staple cotton (about 1-5/32 to 1-1/4 inches long) makes up the great bulk of Peru's cotton crop. In 1950-51, ninety-one per cent of the production was Tanquis (353,500 bales of the total of 388,200 bales harvested; 31,900 bales of extra-long staple). In 1957-58, the estimated total of Peru's crop was 500,000 bales: 386,500 (77.3%) of Tanquis and 107,500 of extra-long staple. In 1958-59, the extra-long staple crop was estimated at 113,500 bales, an all-time high for this fiber.

In the four years, 1950-51 to 1953-54, inclusive, average production of extra-long staple was 39,900 bales; in the next five years, 1954-55 to 1958-59, crops averaged 95,800 bales a year. Whatever increase has been made in volume of Peru's cotton crops in recent years has been in the extra-long staple field, attaining 22.1 per cent in 1956 and 21.5 per cent in 1957 of the total crop. Tanquis has held a consistent level varying from 350,000 to 400,000 bales each year.5

Two varieties of extra-long staple cotton are grown presently in Peru: Pima and Karnak. In recent five years,

5International Cotton Advisory Committee, op. cit., table 11, p. 16. The import quota for Tanquis cotton is now set at 3,000 bales a year. Its most important use in the United States is a binder in spinning asbestos yarn. It is also used in molleton, a fabric used on lithograph and multilith machines.
1954-1958 inclusive, Peruvian Pima annual production has averaged 81,860 bales, the Karnak variety 13,940 bales. The acreage yields (363 pounds average) are considerably less than was obtained from Pima S-l in the United States in these same years (537 pounds average).  

Introduction of Arizona Pima Seed in 1920's

The first extra-long staple variety in Peruvian production was the Egyptian Mit Afifi. About 1923, American Pima seed was brought into Peru and two years later 1,800 bales of this variety was in export. By 1930 production had reached 28,307 bales. The Peruvian Pima almost completely replaced the acclimatized Egyptian Mit Afifi by 1933, with only eighty-seven bales of the latter in export compared with 21,708 bales of the Peruvian Pima. The Peruvian Pima is generally longer than either the Egyptian or American extra-long staples. Because it is less strong, however, it is not suitable for the making of sewing thread. It does take a beautiful luster when mercerized and consequently is used in the production of fine shirtings and dress goods.

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6 Ibid., table 13, p. 18
Extra-Long Staple Cotton
Production Exclusive in Irrigated Valleys

Peru's cotton is produced in the coastal area in numerous river valleys rarely more than forty to fifty miles inland. The extra-long staple production is limited to the Chira and Piura valleys in the far north of the coastline. Both valleys are irrigated and depend on the two rivers of the same names for their water.

In 1951 and 1952 the Piura river was almost dry, resulting in little or no production in this area for these years. Such failures have since been overcome by the construction of the River Quiroz project, stabilizing production in the Piura valley and adding new irrigated acres.

Since there are no government restrictions on cotton production in Peru, the new irrigated area is expected to increase extra-long staple acreage by ten per cent in this area in the next two years.9

The Tanquis cotton, in contrast, is grown in a distinct area in river valleys south of Lima and is planted (August through November) and harvested (April through September) at entirely different seasons than the extra-long staple, which is planted January through March and harvested from July through October. This situation provides a high degree of

9International Cotton Advisory Committee, op. cit., p. 16.
isolation for the two distinct varieties, a guard against cross-breeding problems. The Tanquis was used by Dr. Walker E. Bryan, University of Arizona plant breeder of the high-yielding Pima S-1 now in use in the Southwest, as one of the basic types in breeding the new variety.

Kenneth B. McMicken, when manager of the Southwest Cotton Company (Goodyear subsidiary) at Litchfield Park, Arizona, made a six-months' visit to Peru in 1930 and reported on the qualities of Tanquis, stating that it was discovered on the hacienda of a Peruvian landlord of that name about 1915:

It has every characteristic of the first generation hybrids that are encountered in our Salt River Valley Pima fields. From the viewpoint of the grower it is a wonderful cotton . . . makes a vigorous growth . . . is resistant to wilt . . . outturn is about 40% . . . is a heavy producer, an average of a bale and a half an acre being obtained over whole valleys. Its drawback . . . rather late maturing . . . From the marketing angle, however, Tanquis has its principal faults . . . the lint lacks uniformity and is getting no better fast . . . harsh in texture and the staple varies in length . . . from 1-1/8 up to 1-1/2, and the average is somewhere in between.10

**Cotton Foremost Export for Peru**

Most of Peru's cotton goes into the export trade. In 1956, 69.76% of the export went to Europe (19.5% to Great Britain and 50.26% to the continent). Only 2.5% of the exports came to the United States; 17.03% went to other Latin American countries, 6.99% to Japan, and 2.92%

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10 *Arizona Producer*, October 15, 1930, p. 5
to India. Only some 70,000 bales of the 1956 total crop went into domestic consumption.\textsuperscript{11}

The extra-long staple cotton crop of Peru gives growers a gross income of approximately twenty million dollars a year, which is more than one-fifth of all cotton income and about two per cent of the national income. Exports of extra-long staple cotton, valued at more than twenty million dollars constituted eight per cent of the total Peruvian export trade in 1955-56.\textsuperscript{12}

W. R. Grace & Co., an American corporation with worldwide commercial interests, is most heavily involved in the textile industry in Peru. The company has a sixty-three per cent interest in four mills that make almost half of Peru's cotton goods. The output is for domestic consumption. These mills, with about 75,000 spindles and 3,000 looms, are users of the Peruvian Pima Cotton.\textsuperscript{13}

\textsuperscript{11}Camara Algodonera del Peru (Annual government report for 1956), p. 17. Of the more than 480,000 bales exported, all types, two firms were American exporters: Anderson, Clayton & co., (about 77,000 bales) and W. R. Grace & Co. (some 9,000 bales), anexo No. 25. The Cotton Trade Journal, Memphis, Tennessee, placed cotton exports first in 1952, in cash value, ahead of mineral exports.

\textsuperscript{12}International Cotton Advisory Committee, \textit{op. cit.}, p. 7.

\textsuperscript{13}Freeman Lincoln, "The Bulging House of Grace, Fortune, April 1952, p. 204.
Peruvian Cotton Favored Under United States Import Quota Law, 1940-56

In comparison with other extra-long staples, the Peruvian has been generally priced lower than the Egyptian, Sudanese, and American extra-long staples in the years 1954-55 to 1958. Only once, in January 1957, was American Pima under the Peruvian in price. In 1959, the Peruvian price had been stronger than the extra-long staple grown on the Nile, but only a matter of two cents a pound.14

With a designated area, the Piura and Chira valleys, largely devoted to the extra-long staple and new irrigated acres coming into use it is anticipated that the Peruvian extra-long staple cotton acreage will be extended in coming years. The Peru 1958-59 crop is reported at a record 129,000 bales. At a conference on extra-long staple cotton held at Alexandria, Egypt, September 7-12, 1959, the Peruvian representative stated: "There is every reason to suppose that cotton acreage in Peru will follow the statistical tendency of the last twenty years--that is to expand."15

On December 19, 1940, cotton 1-11/16 inches and longer was excluded from the United States import quota as a defense measure. Inasmuch as most of Peru's extra-long staple qualified


for quota free admission, the United States received more than shown in the listings of quota imports. This special admission privilege was terminated on May 28, 1956.

Since 1956-57 Belgium has been the largest single nation-consumer of Peru's extra-long staple (65,000 bales in the three years 1956-57 to 1958-59). Italy and the Free Republic of Germany also have received more Peruvian extra-long staple: Italy, 48,000 bales; Germany, 32,000. The United Kingdom imports have been less than 13,000 bales in these years. Peru's total extra-long staple export trade for this period has been over 316,000 bales (1956-57, 108,000; 1957-58, 92,000 and 1958-59, 116,000 bales).16

Other Areas Producing Extra-Long Staple

In addition to the production of extra-long staple cotton in Egypt, Sudan, Peru, and the United States, the main sources of supply, the fiber is grown in Aden, the British West Indies, and Italian Somaliland. The crops approximate 30,000 bales per year. None is consumed domestically and normally all goes into the export trade.17

Aden, a British colony, occupies a peninsula on the Arabian coast at the southern end of the Red Sea, has an area of seventy-five square miles and a population of 650,000.

16 Ibid., table 11, p. 7.
17 Ibid., p. 10.
Only extra-long staple is grown there and all is exported. The value of the 1955-56 crop was seven million dollars. The little country produced 24,000 bales in 1956-57, valued at five and a half million.\textsuperscript{18}

Since the United Kingdom is the world's largest consumer of extra-long cotton, she has been a consistent promoter of its production, having a major part in its development in Egypt and the Sudan. The Aden promotion is a later extension of this policy.

The British West Indies still grows the Sea Island and produced 5,000 bales in 1957-58, the only variety harvested. Only 229 pounds of lint to the acre is yielded.

Israel, using the American Pima 32 for seed, grew 2,000 bales of the extra-long staple in 1957-58. The yield of lint per acre was 600 pounds, an exceptionally high harvest for the extra-staple variety.\textsuperscript{19}

The history of extra-long staples everywhere show a similar pattern of production but a variance in its use. All extra-long cotton staple-growing countries, except the United States, export almost all production and in each one cotton

\textsuperscript{18}International Cotton Advisory Committee, op. cit., pp 6-7. In India the "Andrews" variety of Sea Island has been acclimatized with 2,500 acres planted in 1958-59 and is stated to staple only 1-1/4 inches so would not be classified as an extra-long staple. p. 5.

\textsuperscript{19}Ibid., p. 4.
is the country's most important commodity. Only in the United States is extra-long staple a minor crop; some say, a step-child.
SOUTHWEST PRODUCTION OF EXTRA-LONG STAPLE COTTON (1955-56)
FOUR PER CENT OF
WORLD SUPPLY
YEARS IN PRODUCTION
Arizona 1912-1950-
California 1912-1922 1950-
New Mexico 1939-
West Texas 1940-

Table 13. Production of extra-long staple cotton in the United States

<table>
<thead>
<tr>
<th>Season</th>
<th>Allotment</th>
<th>Acreage harvested</th>
<th>Yield per acre</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000 acres</td>
<td>1,000 acres</td>
<td>Pounds 1,000 bales</td>
<td></td>
</tr>
<tr>
<td>1950-51</td>
<td>-</td>
<td>103.2</td>
<td>298</td>
<td>64.2</td>
</tr>
<tr>
<td>1951-52</td>
<td>-</td>
<td>62.8</td>
<td>359</td>
<td>47.2</td>
</tr>
<tr>
<td>1952-53</td>
<td>-</td>
<td>111.8</td>
<td>406</td>
<td>95.0</td>
</tr>
<tr>
<td>1953-54</td>
<td>-</td>
<td>92.1</td>
<td>340</td>
<td>65.5</td>
</tr>
<tr>
<td>1954-55</td>
<td>37.9</td>
<td>34.2</td>
<td>589</td>
<td>42.1</td>
</tr>
<tr>
<td>1955-56</td>
<td>43.3</td>
<td>41.1</td>
<td>499</td>
<td>42.9</td>
</tr>
<tr>
<td>1956-57</td>
<td>42.9</td>
<td>41.3</td>
<td>583</td>
<td>50.3</td>
</tr>
<tr>
<td>1957-58</td>
<td>84.8</td>
<td>80.8</td>
<td>485</td>
<td>81.9</td>
</tr>
<tr>
<td>1958-59</td>
<td>79.7</td>
<td>76.2</td>
<td>527</td>
<td>84.0</td>
</tr>
<tr>
<td>1959-60</td>
<td>68.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14. Varieties of American Egyptian cotton grown in the United States

<table>
<thead>
<tr>
<th>Season</th>
<th>Pima 32</th>
<th>Pima S-1</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1953-54</td>
<td>91.2</td>
<td>.9</td>
<td>92.1</td>
</tr>
<tr>
<td>1954-55</td>
<td>16.8</td>
<td>17.4</td>
<td>34.2</td>
</tr>
<tr>
<td>1955-56</td>
<td>6.2</td>
<td>34.9</td>
<td>41.1</td>
</tr>
<tr>
<td>1956-57</td>
<td>8.3</td>
<td>33.0</td>
<td>41.3</td>
</tr>
<tr>
<td>1957-58</td>
<td>4.0</td>
<td>76.8</td>
<td>80.8</td>
</tr>
<tr>
<td>1958-59</td>
<td>1.2</td>
<td>75.0</td>
<td>76.2</td>
</tr>
</tbody>
</table>

1/ Preliminary

Table 24. Support level for American-Egyptian cotton 1/

<table>
<thead>
<tr>
<th>Year</th>
<th>Cents per pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953</td>
<td>74.52</td>
</tr>
<tr>
<td>1954</td>
<td>65.53</td>
</tr>
<tr>
<td>1955</td>
<td>55.32</td>
</tr>
<tr>
<td>1956</td>
<td>56.70</td>
</tr>
<tr>
<td>1957</td>
<td>59.75</td>
</tr>
<tr>
<td>1958</td>
<td>54.00</td>
</tr>
<tr>
<td>1959</td>
<td>52.95 (min.)</td>
</tr>
</tbody>
</table>

1/ Average quality, net weight in producing area.
CHAPTER V

AMERICAN-EGYPTIAN COTTONS

American-Egyptian extra-long staple cotton, with a volume of less than one per cent of the total cotton crop of the United States, has served as a highly strategic commodity since the first commercial harvest of 375 bales in the Salt River, Yuma, and Imperial valleys of the Southwest 1912. Today this variety is the sole extra-long staple cotton produced in volume in the nation. Since 1939 production has been confined to Arizona, the Trans-Pecos section of Texas near El Paso, and the Mesilla valley of New Mexico.

Pima cotton, the accepted generic term for all American-Egyptian cottons, has proven of great strategic value in both world wars and the Korean campaign.

In World War I, just as it was coming into existence under the guidance of the Federal Department of Agriculture, the Nation's tire and rubber companies turned to Pima cotton when Sea Island was failing and Egyptian imports restricted.

The extra-long staple was essential to the logistics of war where high tensile strength is most needed. Pima was used in the production of airplanes, barrage balloon coth,
machine gun belts, parachute webbing, as well as providing the carcass strength for tires in the world's first motorized war. In World War II and the Korean conflict, the war department placed heavy demands on Pima cotton planters to grow more extra-long staple. Incentive programs to induce greater production were sponsored, and above-market prices established. In times of national need, extra-long staple production reached its highest peaks of cultivation.

**Production: A Pattern of Peaks and Valleys**

The early history of Pima cotton was largely confined to Arizona. The first experimental farms were located at Yuma and at Sacaton on the Gila Indian reservation of the Pima Indian tribe. The Sacaton farm served as the foremost extra-long staple breeding and experimental area for fifty years, and it was here that the American-Egyptian varieties were developed for commercial use. Until 1939 ninety-seven per cent of all American-Egyptian cotton marketed was grown in Arizona. From 1922 to 1939, Arizona was the only state in the union which grew this extra-staple variety.

The story of the propagation of Pima cotton, from the breeding and acclimatization program first centered at Yuma in 1902 to its greatest period of stability in the years since 1950, has been one of hills and valleys in production.

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and feast and famine in the market place. Every decade has had its period of crisis.

After the initial 1912 commercial crop of 375 bales grown by seventy-five farmers in the Salt River, Yuma, and Imperial valleys of the Southwest, the United States Department of Agriculture, represented by a committee of southwestern cotton culture appointed in 1910, recommended that the Yuma and Imperial valleys grow the Durango long-staple upland and the production and the cultivation of American-Egyptian extra-long staple be carried on exclusively in the Salt River valley in Central Arizona. Until 1922, Pima cotton was almost the only variety grown in the Salt River Valley.

The first five years of the new Pima industry, 1912-1916, were years of moderate production increases and fluctuating prices varying from $78 per bale (1914) to $210 per bale (1916). The largest crop in this period was 6,187 bales in 1914. These years were devoted to the problems of establishing a new industry. Gins had to be set up, financing of crops

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2. Harry A. Stewart, "Report of the Cotton Committee," Economic Survey of Salt River Valley, (UA College of Agriculture Extension Circular 59: June 1929), table 2, p. 28. This report shows that in 1912 and 1913 and the years 1918 and 1920, inclusive, Pima was the only cotton grown in Maricopa county; in the other years up to 1922 there were small plantings of upland also.

3. Thomas H. Kearney, "Cotton of American-Egyptian Variety in U. S.,” 1926 Yearbook of Agriculture, p. 252. Bale return is figured on lint sale alone; with seed sale added, growers received $86 per bale in 1914 and $236 per bale in 1916.
arranged, grades and classification by government officials established to provide basis for sale, labor trained, farmers organized to maintain purity of seed, transportation and fair freight rates negotiated, and links made with brokers and mills in the eastern markets in order to sell the new product to the best advantage.

The next four years, 1917-1920, was a period of boom and bust during which prices reached as high as $1.32 per pound in 1919 and dropped to as low as twenty cents a pound the following year, a development which brought disaster to the growers and the industry generally. 4

The 1917 acreage more than quadrupled that of 1916 (from 7,300 acres to 35,400); the 1918 plantings more than doubled the preceding year (78,860); 1919 showed a moderate increase (to 87,700 acres), and in 1920 more acres were sown to Pima cotton (243,000) than has ever been cultivated in a single year since.

The 1920 crop of 92,561 bales was more than double the 1919 crop of 40,437 bales but it brought in almost $4,000,000 less cash. The 1919 crop sold at an average of $456 per bale and the 1920 harvest was marketed for $156 a bale, $300 per bale less, with seed income included. 5 Not until 1942

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5Kearney, 1926 USDA Yearbook, p. 252.
was Arizona's revenue from all cottons to reach the 1919 level of cash return.6

The 1920 cotton market crash accentuated the problems of the Pima undertaking. Cotton was anathema to the farmers who had plowed up good alfalfa land and sold their dairy herds to make big profits in extra-long staple fibre production.

The nation's big tire companies, responsible for the all-too-rapid expansion of the industry in the boom years, had made immense capital outlays for land, new gins and all the facilities needed to grow cotton in a hurry. New production was financed and a ready-made market provided by the rubber-makers until 1920 when record Egyptian cotton imports and a post-war depression combined to drop the bottom from prices. Within a few years, the new low-pressure tire was introduced, and the extra-long staple was

6Department of Commerce, U. S. Census of Agriculture, 1945, (Bureau of Census, Vol. I--Part 30--New Mexico and Arizona), Table II, p. 84, summarizes the Arizona cotton harvests at five-year intervals, starting with the year 1919 as follows:

<table>
<thead>
<tr>
<th>CROP YEAR</th>
<th>BALES HARVESTED</th>
<th>CASH VALUE OF LINT</th>
<th>CASH VALUE OF COTTONSEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919</td>
<td>59,351*</td>
<td>$20,119,989</td>
<td>$1,933,112</td>
</tr>
<tr>
<td>1924</td>
<td>109,519</td>
<td>15,000,848</td>
<td>---</td>
</tr>
<tr>
<td>1929</td>
<td>149,488</td>
<td>15,720,110</td>
<td>2,014,248</td>
</tr>
<tr>
<td>1934</td>
<td>113,629</td>
<td>8,210,832</td>
<td>---</td>
</tr>
<tr>
<td>1939</td>
<td>199,151</td>
<td>11,314,368</td>
<td>2,070,085</td>
</tr>
<tr>
<td>1944</td>
<td>131,928</td>
<td>14,622,047</td>
<td>2,941,995</td>
</tr>
</tbody>
</table>

The value of Arizona's 1942 cotton crop was $24,635,000, of which $11,817,000 (48 per cent) was from American-Egyptian cotton. (USDA Marketing Service Bulletin 164: June 1955, pp 35 and 43). *Both Pima and upland crops.
found too expensive to use. The tire companies themselves were caught with ruinous commitments for cotton they did not need, a situation that brought them to a financial crisis.

There were bank failures in Arizona in 1921; deposits fell off $12,500,000 in a single year. Nobody was happy about cotton in these years.

Salt River Valley Invaded by Upland Variety Cottons

The liquidation of the 1920 Pima crop took several years. The largest United States importation of Egyptian cotton in all history was recorded for the year 1919. After the armistice of November 11, 1918, a total of 485,004 bales of Nile-grown cotton attracted by high prices was dumped on the American market. The domestic crop of extra-long staple found itself in competition with this heavy foreign import at a time when its own market was disrupted.

In 1921, the United States upland crop was the smallest since 1895 due to the infestation of the boll weevil in the southern cotton states. The upland price went up to twenty-five cents per pound at Phoenix as of December 1, 1922, whereas the Pima prices held at thirty-two cents. The closeness of


8 USDA Statistics on Cotton (USDA Bureau of Agricultural Economics Bulletin 99: June 1951), table 1, pp 4-5. The 1921 upland crop was 7,945,000 bales; the preceding year it was 13,932,000 bales. In 1926 a new high crop of 17,978,000 bales of upland was harvested.
these prices induced many Salt River valley growers to feel that there was more money in the upland, and in 1923, for the first time since the American-Egyptian extra-long staple was introduced into the valley in 1912, more acres were planted to the upland varieties (45,000 acres) than to Pima (40,000).

The December 1, 1923 prices narrowed to only five cents a pound (upland, thirty-five cents; Pima, forty cents), and as a consequence Maricopa county growers planted 122,000 acres to upland in 1924, and only 8,000 acres to Pima.9

In the next three years, 1924-1926, world production of upland reached new highs of approximately 16,000,000 bales a year, and upland prices dropped from thirty-five cents in 1923 to fourteen cents in 1926. In the same period Pima prices held close to forty cents a pound. In 1927, more acres were planted to Pima (44,000) than to upland varieties (39,185) in Maricopa county, first home of the Pima. This is the final year Pima maintained a supremacy in acreage in the Salt River Valley. The ideal of the one-variety community was lost, never to be regained.

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9Stewart, op. cit., p. 22. The cotton committee compared net acre returns in Maricopa county for six years 1922-1927 and found that in four of the six years the Pima crops were most profitable. In 1922 and 1923, the high upland prices gave this variety the price advantage over Pima, $13.82 and $33.86 per acre, respectively. In the successive years 1924-1927, the Pima acreage earnings exceeded the upland by $54.97, $14.99, $37.29, and $27.36, respectively. Higher picking and ginning costs for Pima were considered in the comparison. Table IV, p. 31.
Formation of Pima Association To Meet Problems of 1920's

The abandonment of the "one-variety community" in the Salt River valley opened new problems to the incipient extra-long staple industry. Two types of gins--the roller for Pima and the saw for upland--had to be operated by the ginners. The purity of the seed was jeopardized by the two varieties planted in the same area. Contaminated seed destroyed the uniformity of the Pima fiber and lowered the cash return on the market.

In June 1921, the Pima Cotton Growers' Association was organized to bring soundness and vitality to the Pima undertaking after the demoralizing crash of 1920. The association successfully undertook the orderly liquidation of 65,000 bales still unsold from the 1920 crop, secured a credit of $1,200,000 from the war finance corporation to finance the 1921 plantings (only one-half of this was used because of mortgages already pledged), secured lower ginning prices, lower interest rates on loans, lower rates on stored cotton, and higher prices for its certified seed.10

On March 15, 1922, the association launched The Associated Arizona Producer as the official organ of the Pima

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10 Dwight B. Heard, president of the Arizona Pima Cotton Growers' Association for three years, 1921-23, testified in behalf of the association at the 1921 tariff hearing. In the emergency tariff act of 1921, a seven-cent duty was placed on extra-long staple, 1-3/8 inches and over, effective from May 28, 1921, to September 21, 1922.
growers, the forerunner of the present Arizona Farmer-Rancher, well-known farm paper published at Phoenix. In September, 1922, the Salt River Valley Water Users' Association and the Maricopa County Farm Bureau joined the Pima growers in publishing The Producer, and by March 1923 eight additional cooperatives were in the partnership. The magazine continued under cooperative ownership, primarily the Water Users' Association, until August 15, 1933, when it passed to private control. The publication has been a great asset to Arizona agriculture as a medium dedicated to raising the standards of farm production.

On June 1, 1923, the official paper of the Pima Cotton Growers' Association announced the purchase by the association of a one-fourth interest in the Mutual Oil & Cotton Company which in turn bought the holdings (gins, oil mills, and transportation facilities) of the Firestone Rubber Company and the Southwest Cotton Company (Goodyear subsidiary). This gave the association gin facilities at Phoenix, Chandler, Charles M. Morgan, secretary of the Pima association, was editor of The Producer from March to July 1922. He was succeeded by Fred F. McLeod who served until October 15, 1923. T. A. Hayden served as editor until July 1, 1924, when Charles M. Morgan, the first editor, again took over the job. He served a year to be succeeded again by Hayden. On March 15, 1929, Ernest Douglas became the editor and has continued to be affiliated with the publication since. On August 15, 1933, ownership passed from the Salt River Valley Water Users' Association to Editor Douglas and W. S. Powers, then the advertising manager. In 1939, publication name was changed to Arizona Farmer-Ranchman, and is now owned by Arizona Farmer, Inc., with Douglas as editor. Burridge D. Butler, publisher of Prairie Farmer and owner of radio station WLS, Chicago, Illinois, bought into the firm in 1940.

11 Charles M. Morgan, secretary of the Pima association, was editor of The Producer from March to July 1922. He was succeeded by Fred F. McLeod who served until October 15, 1923. T. A. Hayden served as editor until July 1, 1924, when Charles M. Morgan, the first editor, again took over the job. He served a year to be succeeded again by Hayden. On March 15, 1929, Ernest Douglas became the editor and has continued to be affiliated with the publication since. On August 15, 1933, ownership passed from the Salt River Valley Water Users' Association to Editor Douglas and W. S. Powers, then the advertising manager. In 1939, publication name was changed to Arizona Farmer-Ranchman, and is now owned by Arizona Farmer, Inc., with Douglas as editor. Burridge D. Butler, publisher of Prairie Farmer and owner of radio station WLS, Chicago, Illinois, bought into the firm in 1940.
Tempe, Glendale, and Peoria, and favorable arrangements with experienced management of the Mutual Company. The transaction involved an investment of $680,000 and was hailed by the association paper as "the longest forward step ever taken by the Salt River Valley" since the association started.\(^\text{12}\)

In the early years of the 1920's there was resistance to growing any variety other than Pima in the Salt River valley. Upland plantings on the Mesa experimental farm were protested in 1922. The Pima Cotton Growers' Association reflected this attitude by refuting a statement appearing in a prominent textile journal in 1925 that "a very large percentage of short or medium upland staple was to be planted in Arizona," and inferring that the Pima industry is doomed. The association spokesman regretted the circulation of the rumor as unfortunate because many fine goods mills were well pleased with Pima and to have the impression broadcast that there would not be a continuous supply would be "calamitous."\(^\text{13}\)

\(^{12}\)Arizona Farmer-Producer, June 15, 1923.

\(^{13}\)Producer, June 15, 1922, p. 8 The paper cited that the Salt River valley maintained the policy of a one-variety community, and only a very few acres of short cotton were planted by farmers who failed to get a stand of Pima because of the cold spring. The valley growers planted 77,000 acres to Pima in 1922. "In other parts of Arizona, notably the Yuma district, the Florence-Casa Grande district, and the outskirts of the Salt River valley district, there will be planted a multiplicity of shorter varieties. But this does not affect the fundamentals of the Pima industry," the cotton magazine stated.
The first break in the association determination to deal exclusively with Pima cotton came in September 1922 when the short staple growers of the Yuma district were invited into membership. On January 1, 1923, the directors of the association stated they were "trying to keep an open mind relative to the advisability of growing one kind of cotton or another" but recommended pure seed whatever the choice. A month later the association advertised the sale of two kinds of Acala, Hartsville, and Durango upland seeds as well as Pima, prefacing the price quotations with this statement: "Your association is entirely neutral as regards the variety of seed you may require."\(^{14}\)

The Arizona Pima Cotton Growers' Association became a marketing agency for all types of cottons and all kinds of seeds. In the speculative era of the late 1920's the association suffered heavy losses from which it did not survive. In November 1930 the formation of a new cooperative, Arizona Cooperative Cotton Growers, was announced. This group joined in contract with Anderson, Clayton & Co. and its Phoenix subsidiary, the Western Cotton Producers' Association. The agreement covered ginning, sale of lint and seed, and a division of profits up to five dollars a bale on lint and ten dollars a ton on cottonseed.\(^{15}\)

\(^{14}\) *Producer*, February 1, 1923, p. 5.

\(^{15}\) *Producer*, November 15, 1930, p. 1.
The peaks and valleys of Pima production continued in the two decades of 1930-39 and 1940-49. In the depression years of 1932 and 1933, less than 10,000 bales were ginned each year. The average annual production for the 1930-39 decade was 16,995 bales. In 1937, Pima cotton consumption in the domestic mills was only 6,164 bales, the lowest in eighteen years.\textsuperscript{16}

New Mexico and Texas planters joined Arizona in the three World War II years, 1941-42-43, to increase production to a yearly average of 64,639 bales in response to urgent pleas of the War Mobilization Board for more extra-long staple for defense needs.

The next six years, 1944-49, saw Pima production sink to its lowest levels in history. The annual crop for these years in the three states averaged only 4,585 bales. The all-time low came in 1947 when the total extra-long staple cotton crop was 1,205 bales: Arizona, 163 bales; New Mexico, 101; and Texas, 941. Pima cotton as an industry was close to extinction in 1947.

\textbf{Higher Production, Consumption Exports Since 1950}

Since 1950, Pima production has been the most stable in its history. The crop has never dropped below 40,000

\textsuperscript{16}W. K. Shaw, Jr., \textit{Is the American-Egyptian Cotton Market Vanishing?} (Pamphlet: December 12, 1938).
bales in any year and a new record for a single year's production, previously set by the 1920 crop, was established in 1952 with an all-time volume for a single year of 95,000 bales, apportioned: Arizona, 43,800 bales; Texas, 32,400; New Mexico, 18,100; California, 700.¹⁷

The events of the 1950 decade opened up a new era in the extra-long staple cotton industry in the Southwest. Production has been the highest and most consistent in Pima history, larger by 250,000 bales than any previous decade since the first commercial crop of 1912.

Not only had an all-time record production for one year been established (95,000 in 1952) but in two years (1956-1957) for the first time since Pima production started, the spinning mills of the United States used more Pima cotton than the imported Egyptian or the Peruvian extra-long staples.¹⁸

Almost phenomenal when compared with previous records is the volume of export attained by Pima cotton in the 1950 decade. In the twenty-five year period, 1931 to

¹⁷ USDA Statistical Bulletin 99, table 197, p. 204.

¹⁸ Rafler, op. cit., p. 5 and table 7, p. 18. In 1956-57 United States mills consumed 110,594 bales of extra-long staple: Pima, 61 per cent (67,013 bales); Egyptian, 25 per cent (20,010 bales); Peruvian, 14 per cent (15,571 bales). In the eleven-month period, August 31, 1957 to July 1, 1958, United States mills consumed 91,594 bales in this proportion: Pima, 45 per cent (40,819 bales); Egyptian 38 per cent (34,429 bales); Peruvian, 17 per cent (16,346 bales).
1955, approximately 9,000 bales of American-Egyptian cotton had gone into the export trade.

In the next four years, 1955-58 inclusive, more than 110,000 bales of Pima cotton was shipped to foreign countries.¹⁹

High-Yielding Pima S-1 Stimulus To Extra-Long Staple Industry

Record production figures, increased consumption of United States mills, the domestic-grown extra-long staple cotton and the rise of Pima to an export crop, was the result of the development of the new extra-long staple variety, Pima S-1. Dr. Walker E. Bryan, plant-breeder on the staff of the University of Arizona since 1916, created this superior quality, high-yielding variety after a score of years involving a complicated cross of Peruvian Tanquis, Pima, Sea Island, and Stoneland upland varieties.²⁰

The new Pima S-1 became generally available in Arizona in 1954 and was used to plant nearly all of the 44,000 acres


²⁰ University of Arizona, College of Agriculture, 46th Annual Report For Year Ending June 30, 1935 reports a Pima-Tanquis cross made by Doctor Bryan. The Tanquis seed was furnished by Dr. T. H. Kearney. The Tanquis had a lint percentage of about 38 per cent as compared with Pima's 28 per cent. Bryan reported 145 fourth generation plants being grown in 1935 to make further studies. No Egyptian cotton seed was used in the development of Pima S-1. Farmers inspecting the new variety in experimental fields at university farm dubbed the plantings "Dwarf Pima" because of its comparative size to earlier varieties.
allotted to extra-long staple in 1955 under the government's acreage control. The advent of Pima S-1 with its high-yield potential competed with upland for grower favor and revitalized the extra-long staple industry.

In the thirty-eight years of American-Egyptian growth history in Arizona prior to 1950, only in four years had acreage yield exceeded 300 pounds of lint (1939, 1946, 1948 and 1949) with the top yield 346 pounds in 1946. From 1954 to 1957 inclusive, Pima S-1 averaged 651 pounds of lint to the acre in Arizona. Compared with previous four-year periods, this was more than double the 1946-1949 acre yield of Amsak and SXP varieties (314 pounds) and 176 per cent above the Pima 32 yields of 1950-1953 (369 pounds), the American-Egyptian varieties in major use in the years specified.21

**Development of New Markets by SuPima Association of America**

Added to the favorable developments of the mid-1950's (high volume of production, greatly increased exports, higher rate of consumption in domestic mills, and more lint fiber to the acre than ever before), the industry's status was augmented by the incorporation of the SuPima Association

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of America following a meeting of extra-long staple growers of Arizona, New Mexico, and Texas, held at Phoenix in July 1954. The growers were concerned about the end use of their product.

The military stockpile absorbed the crops of 1951 and 1952 and the Commodity Credit Corporation acquired almost the entire 1953 crop and eighty-four per cent of the 1954 crop.

In the three years, 1952-54, American mills used more than ninety per cent imported foreign cotton and less than ten per cent domestic cotton. The reason for this disparity was plainly evident: The price of American-Egyptian cotton at the New England mills was excessively higher than the delivered imports.

In the six months prior to the Phoenix meeting, the price for Pima cotton (January-June 1954) at the mills held at eighty-three cents per pound (No. 2, 1½ inch) and the Egyptian government delivered a comparable grade (fully good to extra, good staple) to American mills at prices (six-month average, 61.83 cents a pound) more than twenty-one cents a pound below the American product.

Faced with the fact that the government loan level had priced Pima out of the market and the government must eventually cease to buy the bulk of the domestic crop, the SuPima association undertook to make its product competitive by asking Congress to lower the existing price support from
ninety per cent of parity to seventy-five per cent. The growers were convinced that they could make a profit at the lower price by planting Bryan's high-yielding Pima S-1. As a result of the reduction in support levels (a potential loss of fifty-three dollars per bale for growers), in all but two months of 1956 Pima mill prices were from a few cents to as much as twelve cents a pound under Egyptian extra-long imports.

With the price competitive, the SuPima association launched a selling-campaign which, aided by the Soviet-Egyptian arms deal and the Suez crisis, resulted in 1956, for the first time since Pima production started, in a greater use of domestic extra-long staple cotton in American mills than all imported varieties, and in 1957 more than either Egyptian or Peruvian imports.22

The mill consumption and an export business of 110,000 bales in three years, 1954-57, reduced the inventory of the Commodity Credit Corporation from 99,714 bales from the 1954 crop to 1,579 bales after the 1956 harvest.

With demand at high level, SuPima association secured by law release of 50,000 bales of military stockpile extra-long varieties to prevent runaway prices which might again price Pima cotton out of the market. The government had placed extra-long staple under acreage and marketing control in 1954 and because of the favorable 1956 Pima market.

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22 Supra, p.76, fn. 18.
authorized higher production levels for 1957 (76,600 bales) and 1958 (79,000 bales). This more than doubled the quotas for 1955 (the minimum 30,000 bales) and for 1956 (35,300 bales).

The SuPima plan for getting the domestic extra-long staple into trade channels met with gratifying success. The first converter (Hope Skillman, a specialist in American cottons) made a sheer chiffon called Breeze from Pima lint and Adele Simpson, one the nation's top designers, in October 1955 showed SuPima-Skillman chiffon in her cruise-line display. The first national advertisement, featuring the Simpson creations, was run in December 1955. This ad, in four colors, won three national awards and was the first of many to run in the nation's high-style magazines: such as Harper's, Bazaar, Vogue, The New Yorker, Women's Wear Daily, and Town and Country.

Printers' Ink, a magazine devoted to advertising, selling and marketing, reported in February 1957 that SuPima's continuing efforts to interest various converters in the extra-long staple of the Southwest met "with dramatic success":

Thirty-five fabrics—ranging from sheer chiffons and voiles to broadcloths, woven novelties and knits—are now manufactured by sixteen different mills and converters. Designers, too, have jumped on the SuPima bandwagon, and such names as Cassini, Estevez, Leser, and McCardell are featured in the association's advertising.23

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SU PIMA BOARD OUTLINES PROGRAM AND PROGRESS
IN LETTER TO 3,000 MEMBER-GROWERS

Dear Member:

SU PIMA’s progress has been great, but all obstacles have not been removed.

A recent meeting of the Board was devoted exclusively to analyzing our current situation. In order for the Board to do this, we first discussed SU PIMA’s objectives — namely (1) Better prices for the farmers; (2) More acreages; (3) Stability of acreages and price.

The current situation, as a result of the Quality, Price and Promotion program, has been instrumental in many achievements. The Promotion program for example has returned some $150 to $200 worth of advertising and publicity for each dollar spent. Quality is improving due to research. Other research is making real progress.

The Board believes that our problem at present is price and stability. We feel that better prices and better stability can be had by maintaining a competitive price and by creating a demand for our product through promotion.

There are two paths a farmer can follow — one is high government price supports and rigidly controlled acreage which means a leveling process or equal shares. Second, he can follow the path of free enterprise which means competitive pricing and expanded acreage as his product is moved into domestic and foreign markets. This is in interest to an expanded, long range agricultural program rather than a program of shrinking acreage.

This we believe — we hope you do.

Board of Directors
SU PIMA Association of America
J. Clyde Wilson, President

In only two years (since our first ad), these names plus many others are being associated with SU PIMA. More and more are joining the SU PIMA program. This will result in a greater demand for SU PIMA and eventually, more stability for our industry.

"We’re Building Fast!"

Above letter, mailed during the presidency of J. Clyde Wilson lists outlets established since the association was organized in 1954. Wilson of Buckeye, Arizona, retired as president in 1959, and was succeeded by Mark Rickman of Texas. Albert Oshrin of Tucson is Arizona vice president of the association.
Until March 1957, Pima cotton prices at the New England mills were below Egyptian imports, but commencing in April foreign extra-long staple cotton began to sell below the domestic product and by May 1958 the spread was more than fourteen cents a pound.

**Lower Quotas on Foreign Imports Rejected**

The SuPima association growers were convinced that no matter how low the domestic extra-long staple was priced that the Egyptian government and other countries could and would under-price the domestic cotton in order to firm their currency with "hard" American dollars. The association tried to maintain a competitive position by seeking further reduction in price support from seventy-five per cent to sixty-five per cent (which is the 1960 ratio) of parity, but even with this drop the price gap was fifteen cents a pound.

Inasmuch as the Egyptian government set the delivered prices in the New England market, the SuPima officials determined that the only means of preserving newly-established markets rested with the United States government, which held the industry under acreage and marketing controls.

The federal Department of Agriculture, at the request of the SuPima association, asked for a hearing before the Tariff Commission and recommended that import quotas, in
effect since 1939, be reduced by fifty-two per cent.\textsuperscript{24} The State Department opposed the reduction because of the expressed fear that the reduction "would strike a heavy blow to the dollar income earned, particularly by Egypt, in selling its cotton to the American market."\textsuperscript{25} The commission by a three-to-two vote refused to recommend the change asked.

The decision was a severe blow to the domestic growers who envisioned the loss of their newly-won outlets to a foreign product, profiting from the association's merchandising program without sharing the cost.

The surplus problem, which had all but disappeared after the 1956 crop, was again a depressing effect on the domestic industry. The Commodity Credit Corporation, which had cleared stocks on hand to 1,579 bales after the 1956 crop, had an

\textsuperscript{24}The hearing was held under a provision of the 1938 Agricultural Adjustment Act (section 22) in which Congress authorized the President on recommendation of the Tariff Commission to cut imports of commodities when such imports interfered with the program set up in the act. The agricultural department cited five programs dealing with domestic extra-long staple cotton which, the Department charged, the foreign imports were impeding. These were: (1) A price support program; (2) An acreage allotment and a marketing quota program; (3) Export disposal program; (4) In the Soil Bank Act, and (5) A crop insurance program. The minority Tariff Commission report asserted that it was not in the purview of commission functions to weigh the appropriateness of the programs or their administration, since this was under continuing review by the Congress. It was the commission's function to determine only if imports interfered with the USDA program.

\textsuperscript{25}Arizona Star, April 29, 1959.
inventory of 77,500 bales after the 1957 crop, including the unsold 40,000 bales released from the military stockpile (and 230,000 bales which still remained in the strategic stockpile).

The SuPima association appealed to Congress to freeze the acreage and marketing quotas for 1960, which otherwise would be lowered to the minimum 30,000 bales by the formula then provided. Congress responded with a law, effective for 1960 only, stipulating that the 1960 quota could not be lowered more than ten per cent of the average of the previous four years. Under this law, the reduction was eight per cent.

The association also secured the inclusion of extra-long staple as an exportable commodity which could be sold in foreign countries under public law 480 with payment "in kind" or "soft" currencies.

Support of National Cotton Council to Pima Industry

The United States Department of Agriculture has assured Pima cotton growers that support will be given the industry to obtain a future hearing before the Tariff Commission because, as Assistant Secretary Clarence L. Miller wrote, "we believe that interference of imports with the department's program continues." The secretary added: "We will keep the extra

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26 Arizona Farmer, January 16, 1960. Quotations are from a letter received from Assistant Secretary Miller to Albert Oshrin at Tucson, vice president of the SuPima association, dated December 18, 1959. Secretary of Agriculture Ezra Taft Benson in April 1955 said of the SuPima association merchandising program: "This campaign to build markets through improved quality, modern promotion techniques and competitive prices is in keeping the the best American traditions."
long staple cotton situation under review, and we hope the producers will continue their highly commendable effort to expand its use." This the SuPima association has pledged itself to do.

Although the extra-long staple growers had the all-out support of the Department of Agriculture, the Department of State has declared the industry "expendable" and recommended that the extra-long staple growers "grow vegetables."27

The SuPima association has now set their sights on a long-range program, outlined and given endorsement at the 1960 convention of the National Cotton Council held at Dallas, Texas, in February. This program seeks to:

(a) Establish and maintain extra-long staple production in the United States on a permanent and sound basis with a minimum of 64,776 acres;

27Arizona Star, February 25, 1959, p. 16. Tim Malone, called the biggest extra-long staple grower in Arizona (Farmer, January 5, 1952, p. 3) did, in 1944, after Pima growers were discontented with treatment received at the hands of the government in the World War II buying program, desert Pima cotton for vegetables. (Farmer, "Onward and Upward with Tim Malone," October 6, 1945, p. 11). His case was typical of the industry. He came to Arizona, in 1925, produced Pima cotton yielding more than short staple, and was declared "Pima Cotton King" in 1935 by winning a University of Arizona-sponsored high-yield contest. In 1939, he had 3,000 acres in Pima but was interested in vegetables. When the government pleaded in 1942 to produce Pima for military use he grew 1,500 SXP acres. In 1944, there were only two Pima growers in the Glendale area: Malone had 600 acres, the other 200. The next seven years, he did so well in vegetables he said he wanted to forget his Pima past. Yet again, at the call of the Office of Defense Mobilization, he planted 800 acres of Pima 32 in 1951. Labor was the problem in 1952 even as it was in 1942. After the 1952 harvest, Malone said: "I'll plant no more long staple until assured of harvest labor."
(b) Maintain consistent and satisfactory quality of cotton;

(c) Assure continuing availability of supply, including adequate working stocks; and

(d) Maintain a reasonable price relationship to world prices for comparable qualities.28

The National Cotton Council agreed at this convention to join the SuPima association and the American Cotton Manufacturers Institute in a special study to make the proposed program effective.

Efforts to establish and maintain a domestic extra-long staple cotton industry on a stabilized basis has been a continuing struggle ever since Kearney went to Yuma in 1902 to undertake the propagation of an extra-long staple to meet the competition of a foreign product. The successes were outstanding but not enduring. J. Clyde Wilson of Buckeye, Arizona, reported to the SuPima's fifth annual convention in Phoenix in March 1959, that the domestic extra-long staple situation was "desperate but not hopeless."29

The decade of 1950 had brought much in the way of accomplishment even though it was ended on a pessimistic note. New records of production, domestic consumption, volume of export trade, and acreage yield had been made. The new Pima S-1 met all the severest quality tests against

28*Arizona Farmer*, February 27, 1960, p. 42.

foreign imports. An aggressive and well-financed growers' association of some 3,000 members (SuPima) was organized to meet the problems, of which Wilson, retiring in 1959 as SuPima president, said there were more than ought to be.

Two of the biggest problems were still unsolved and interrelated: (1) Foreign-government under-selling Pima Cotton prices in the New England market and (2) more and more domestic cotton into government warehouses, contributing to excessive surpluses and carryovers.

Stabilization in production, if not in price, had been met during the 1950's. The volume of production for the ten years, 1950-59, reached a total of 636,000 bales, an average of 63,600 bales a year, more than double that of any previous decade.30 One of the complaints in the early history of domestic extra-long staple cotton growing was that manufacturers could not be assured of a continuing supply. Growers have proven that they are now in position to supply all domestic demands, in peace and war.

30 USDA Agricultural Marketing Service, Cotton and Cottonseed (Statistical Bulletin 164, June 1955, updated) Table 38, p. 41. Production for decades prior to 1950 in gross weight bales of 500 pounds:

<table>
<thead>
<tr>
<th>Decade</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912-1919</td>
<td>107,300</td>
</tr>
<tr>
<td>1920-1929</td>
<td>315,700</td>
</tr>
<tr>
<td>1930-1939</td>
<td>171,700</td>
</tr>
<tr>
<td>1940-1949</td>
<td>253,400</td>
</tr>
</tbody>
</table>
PART II

THE PIMA COTTON INDUSTRY
IN THE UNITED STATES
COMMITTEE ON SOUTHWESTERN COTTON CULTURE

Appointed by Chief of Bureau of Plant Industry in 1910 to propagate American-Egyptian Cotton in Southwest.

Five men pictured above played important roles in the Pima cotton industry. O. F. Cook, promoter of one-variety cotton community in the Salt River Valley, reported on acclimatization and cultural methods employed. Carl S. Scofield, committee chairman, surveyed markets here and abroad. David Fairchild, together with Barbour Lathrop, sent Egyptian seed to Southwest for 1901 trial plantings. Thomas H. Kearney spent most of his adult life breeding American-Egyptian cotton varieties used in the Southwest. W. T. Swingle worked with the Indian Affairs Bureau at Sacaton, recruited and trained Indian labor for picking Pima cotton. Picture was taken in June 1936 when P. H. Dorsett (center) was presented Frank N. Meyer medal (awarded Lathrop in 1920 for bringing in foreign seeds) and reproduced from Journal of Heredity (July 1936, page 307). Dorsett and friend (second from left) were not associated in cotton work in the Southwest.
CHAPTER VI.

PIONEERING A NEW INDUSTRY

The high quality of Egyptian cotton was recognized by the United States Department of Agriculture as early as 1867. The department reports of 1867 and 1871 contain the results of more than fifty trials in all the states then producing cotton, from North Carolina to Texas to Alabama. The crop required too long a season from planting to maturity and, except in one or two instances in Southern Louisiana, was found generally unsatisfactory. As a consequence, there were no further experiments during the next twenty years.

From 1892 to 1894 the department again imported Egyptian seed which was sent to all cotton-growing states for testing at experiment stations and private plantations. Failures were reported in almost every case; growers were so discouraged that they did not bother to save the seed for further trials.¹

¹Lester H. Dewey, *Egyptian Cotton in the United States* (USDA Division of Botany, Circular 26, March 18, 1900), pp 2-3. W. H. Wentworth in San Patricio County in southern Texas obtained only seventy-five pounds of seed cotton from three acres but noting its superior quality carried his planting to the sixth generation (1899). The acclimatization improved the stand but as a lone producer he gave up; the volume was too small to command a market.
The year 1898 marked the beginning of scientific cotton breeding in the United States. That year Dr. Herbert J. Webber started cotton breeding for the United States Department of Agriculture, making Egyptian cotton an important item of study. Prior to 1898, limited cotton breeding had been done at several state experiment stations but, lacking coordination and continuity, little of permanent value resulted.²

Webber's first attempts at producing an Egyptian-type cotton on American soil were made in the humid section of the United States, particularly in South Carolina and Texas. He concluded that Egyptian varieties could not be profitably grown anywhere in the main cotton belt and he so informed the Southern Cotton Spinners' Association at its 1903 convention. L. H. Dewey, in charge of fiber investigations, in 1901 and 1902 received numerous reports of trial plantings which confirmed that little success could be expected from Egyptian cottons in the humid portion of the cotton belt.³


³Thomas H. Kearney and William A. Peterson, Egyptian Cotton in the Southwestern United States (USDA Bureau of Plant Industry Bulletin 128), pp. 33-34. Dewey reported an excellent quality of fiber but small yields due to the shortness of the season which prevented many bolls from ripening. There was also delay in the spring by wet weather and killing frosts took place so early in the fall as to prevent full harvest.
In 1901 and 1902, Egyptian seed reached Arizona and California, coming from shipments sent from Cairo by David G. Fairchild and Barbour Lathrop, a Chicago philanthropist and world traveler with whom Fairchild had been associated since 1895 as an assistant in botanical researches. In 1898, Fairchild organized the Office of Foreign Seed and Plant Introduction and served as its head, except for leaves of absence on special expeditions with Lathrop, until his retirement in 1928. The importation of a large amount of Egyptian cotton seed was noted by the agricultural department in its 1900 report:

Through the generosity of Hon. Barbour Lathorp of Chicago, the Department of Agriculture has been made the recipient of a large collection of seeds and plants... the result of an exploring expedition which lasted from December 1898 to September 1900. He was accompanied by Mr. D. G. Fairchild, formerly special agent in charge of this department. This expedition procured over 450 separate items of seeds and plants... One of the most promising importations of the year has been the Jannovitch cotton, secured in Egypt by Messrs. Lathrop and Fairchild. About 2,000 pounds of seed have been placed among some 1,100 experimenters in the cotton states.

4 Who's Who in America, 1903-1905, p. 468, gives five expeditions made by Lathrop and Fairchild: To Dutch East Indies, 1895; to South Sea Islands, Siam, Australia, and New Zealand, 1896-97; to West Indies, South America, Egypt, Ceylon, Dutch East Indies and New Guinea, 1898-1900; to Japan, China, Ceylon and Persian Gulf, 1901-02; Africa, 1903.

5 Annual Report Department of Agriculture, 1900, p. 5. The department expressed warm thanks to Mr. Lathrop as a public-spirited citizen, stating many importations had already proved of decided value.
Fairchild, in a book published in 1938, placed the price of Jannovich seed, then a new Egyptian variety, at twenty dollars a pound, and as a consequence he had decided to send only small samples to the United States. Larger shipments were prompted by the apparent generosity credited to Lathrop by the Department of Agriculture. Fairchild said the increased volume of seed resulted from a conversation between the two:

I described the cotton situation and told him of the samples I was sending to Washington. After a moment he said quite simply "...if you think it is such a good thing, why don't you send more of it?"... Mr. Lathrop persuaded me to send two bushels of each variety, which was fortunate as, unbeknownst to me, my old friend Webber had begun his cotton-breeding experiments. Some of the seed was sent to Arizona and California and from it grew the first cotton of that section, drawing attention to the possibility of Egyptian cotton culture in the Southwest. Three years later (1902), I photographed Doctor A. J. Chandler standing beside his cotton plants grown in Arizona from the Egyptian seed. During the next quarter of a century, T. H. Kearney, O. F. Cook, Swingle and Webber all spent much time in the improvement of the Egyptian cotton, and Chandler, Arizona is now the center of a large cotton-growing district.\(^6\)

Through a series of accidents the original selections

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\(^6\)David G. Fairchild, *The World is My Garden* (New York: Scribner's, 1938), pp 141-142. The photo of Doctor Chandler referred to above appears on p. 140-B. On pp 205-07 the author writes: "I had no real conception of the enormous amount of careful pioneer work and plant-breeding investigations which would be necessary before an Egyptian cotton industry was established around Chandler. Nor could I foresee how much the working out of this problem would absorb the lives of my friends—Cook, Kearney, Scofield and others—leading them into the field of genetics, a new branch of science."
from the imported Jannovich variety were lost. The Mit Afifi variety became the parental stock of the first domestic extra-long staple cotton varieties of the Southwest.

**McClatchie Experiments at Phoenix Farm in 1901**

Prior to 1902, two other plantings of Egyptian seed in the Southwest are of record, in addition to the Chandler fields cited by Fairchild. One was located at the territorial experiment farm, affiliated with the University of Arizona, two miles northwest of Phoenix, and directed by Professor A. J. McClatchie, the superintendent. The other was in the Imperial Valley, California, on land where Calexico now stands. Doctor H. J. Webber, who started the plant breeding program in the Department of Agriculture, directed the Calexico planting, in cooperation with T. H. Kearney.

The Egyptian cotton experiment at the Phoenix farm was undertaken in the spring of 1901 using three varieties: Abassi, Mit Afifi, and Jannovich. The crop was ginned on a roller gin at Audobohn Park, Louisiana, through the kindnexitx of Director Stubbs of the Louisiana experiment station. The experiment continued in 1902, but Professor

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7Kearney and Peterson, op. cit., p. 37.

McClatchie announced that there would be no further plantings the following year, inasmuch as the culture had been continued long enough to establish the main facts as to varieties and methods. He found that growing on a sufficient volume for results to be practical required a large amount of labor.⁹

The plantings by Doctor Webber in the Imperial Valley may have antedated the Egyptian cotton seedings at Chandler and the Phoenix territorial farm station, although it is probable they were contemporary sowings notwithstanding this claim:

In 1900 Webber grew about three acres of Mit Afifi in the Imperial Valley, California, on land where Calexico now stands. This was the first year water was turned into the irrigation canal and the cotton was the first grown in this valley. A number of selections were made from this patch, which marked the real beginning of the American-Egyptian cotton industry in this country.¹⁰

As of April 1, 1907, Doctor Webber resigned from the department to accept a post at Cornell University at Ithaca, New York, and Doctor Thomas H. Kearney, who had been associated with him from the start of the plant-breeding program, was given complete charge of that phase of the work in the Southwest. His earliest reference to

plantings at Calexico was a crop of outstanding Jannovich grown there in 1902 and in 1903. In 1904, Mit Afifi and Jannovich Egyptian varieties were planted only at Carlsbad, New Mexico, and Yuma, Arizona.\footnote{Kearney and Peterson, \textit{op. cit.}, pp 34-37.}

Of the three Egyptian cotton experiments undertaken before 1902, none were carried through to commercial production, but all proved that the Southwest was the most favorable area for development. Doctor Chandler gave up his experiments because of the difficulty in finding the help needed to cultivate, harvest and market the crop properly.\footnote{Phillip R. Kellar, "Golden Snow in the Southwest," \textit{Country Gentleman}, September 26, 1914, p. 1594.} McClatchie had reported in detail on two years of experiment with the crop, following directions laid down by Professor Foaden, an Egyptian authority. McClatchie conveyed information on how and in what amounts water was applied and the results from various methods of irrigation, valuable data for future planters.\footnote{A. J. McClatchie, "Irrigation at the Arizona Experiment Station Farm," \textit{Report of Irrigation Investigations, 1901}, (Office of Experiment Stations Bulletin 11: 1902), p. 100. Cotton grown from Mit Afifi seed planted by McClatchie was tested at the Lowell, Massachusetts textile school and, compared with imported Mit Afifi, showed four per cent less waste and furnished thread fourteen per cent stronger.}

Full development of the extra-long staple cotton industry in the Southwest, however, passed to other persons.
Foremost of these was Doctor Thomas Henry Kearney, who gave most of his adult life to the development of American varieties of Egyptian cotton. Before his retirement on June 30, 1944, he had propagated four distinct varieties, each better than its predecessor. The Department of Agriculture in announcing Doctor Kearney’s retirement referred to him as "the plant scientist whose research was the basis of the American-Egyptian cotton industry."  

Yuma Cotton Experiment Center in 1902

Starting in 1902, the Bureau of Plant Industry intensified experimentation with Egyptian cotton, doing the concentrated study at Yuma, Arizona, as the area where successful

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14 In 1920 the University of Arizona bestowed upon Kearney the honorary degree of Doctor of Laws as the originator of the Pima variety of extra-long staple which in 1919 "was worth to the State of Arizona no less than twenty millions of dollars," according to Dean Working of the College of Agriculture who introduced him to the assembly. A native of Cincinnati, Ohio, Kearney began work in the USDA when he was twenty years old. One of his achievements, best known to botanists, was the preparation in collaboration with Robert H. Peebles, an associate at Sacaton, of "Flowering Plants and Ferns in Arizona," an authoritative book listing the plants of the state. This was first published by USDA in 1942. A second edition was published by the University of California in 1952. Moving to San Francisco after his retirement in 1944, Kearney became honorary curator and a research associate with the California Academy of Scientists. He died in a San Francisco hospital in October 1956 at the age of 82 years.
growth was most likely. This region was selected after Kearney and Thomas H. Means of the Bureau of Soils had visited Egypt and made a detailed survey of the climate, soils, irrigation methods, and growing conditions along the Nile River.

For the next five years, Yuma was the center of testing with minor plantings and preliminary tests in other areas. In 1907, land was acquired on the Gila Indian reservation near Sacaton, some thirty miles south of Phoenix, through agreement with the Indian affairs office of the Interior Department. For fifty years Sacaton was the locale of extra-long staple cotton experimentation in the United States and the home of development for all the American-Egyptian varieties. Since 1957 federal, state and University of Arizona personnel have cooperated in cotton experimentation at the new cotton center at Phoenix, largely financed by the

15 USDA 1907 Yearbook, p. 322. A tract of six acres of land belonging to the Reclamation Service was made available to the Bureau of Plant Industry and ten acres on the Yuma mesa, about sixty feet above the Colorado River, was leased. Cotton, with other fruit and forage crops, were tested on all three areas. In 1909 experimental plantings were located near the Village of Somerton, about fourteen miles south of Yuma. In 1910 most of the work was transferred to a 150-acre experimental farm situated on the California side of the Colorado, near Bard, about seven miles above the town of Yuma. After 1907, Sacaton, located on the Gila Indian reservation in Central Arizona, became the chief center for cotton experiment.
Arizona Cotton Planting Seed Distributors, a farmers' cooperative.

Preliminary experiments made by Webber and Kearney in 1902 in the Southwest included: the Mit Afifi variety at San Antonio and Barstow, Texas, and Carlsbad, New Mexico; the Jannovich variety at Barstow, Carlsbad, Yuma, and Calexico, California. In addition Webber supervised trial plots planted to the Mit Afifi at Hartsville, South Carolina, and at Houston and Brownsville, Texas, with the Jannovich variety at Denison, Texas, and with the Asmuni at Danville and Waco, Texas.

Fourteen samples, representing each variety from each locality where grown in 1902, were submitted to seven American cotton buyers, and a buyer at Alexandria, Egypt. The Jannovich grown at Calexico (about sixty miles west of Yuma) was most highly commended by all of these experts.16

In 1903 the Mit Afifi and Jannovich were planted at Barstow, Carlsbad, Yuma, and Calexico, one area in each of four states: Texas, New Mexico, Arizona, and California, respectively. In 1904 and 1905, the extra-long staple experiments were continued only at Carlsbad and Yuma. In 1905, high spring floods wiped out the plantings at Yuma, leaving Carlsbad as the only location where acclimatized

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16Kearney and Peterson, op. cit., pp 34-35.
seed of the Egyptian varieties survived. A large number of selections were made from the Carlsbad nurseries and transferred to Yuma where experiments were centered in 1906 and 1907. It was the Carlsbad acclimatized Mit Afifi that became the parent stock of the new American-Egyptian varieties.

**Appraisal of 1907 Yuma Crop by Twenty-Two Cotton Experts**

Small samples of Arizona-grown Egyptian cotton grown in 1907 were placed with twenty-two American buyers and spinners of extra-long staple cotton for testing and comparison with imported stock. Those examining these samples were practically unanimous in expressing the belief that the Arizona-grown product could be satisfactorily substituted for similar grades of imported Egyptian cotton. The average length of the fiber grown at Yuma in 1907 was one and one-half inches and the strength, luster, fineness, and color were good.

During the first years of experiment the plants had made an excessive growth of wood and relatively few bolls sprouted, and these ripened late and did not open properly. In the season of 1906 and 1907 the size of the

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plants diminished in size and the average number of bolls greatly increased; the bolls ripened earlier and opened wider, making picking much easier. The Mit Afifi yield at Yuma for 1907 went almost two bales to the acre on the experimental plots. A five-acre field yielded 3,300 pounds of cotton seed to the acre, with a lint percentage of thirty estimated.\textsuperscript{19}

The federal Department of Agriculture reported in 1907 that "gratifying progress has been made in this work [acclimatization], Egyptian cotton of the Mit Afifi variety having been grown under irrigation at Yuma, Arizona Arizona...."\textsuperscript{20}

After receiving the appraisals of the twenty-two American buyers and mills from small specimens of the 1907 crop, samples of 200 pounds each were sent to three American mills using large quantities of imported Egyptian cotton.

\textsuperscript{19}Ibid., p. 44.

\textsuperscript{20}Ibid., p. 61. Excessive vegetation growth was a problem cited by McClatchie in his 1901-02 experiments with Egyptian cotton, noting in his irrigation report that part of the field was too rank and some of it lodged. This is evident, also, in the Fairchild picture of Doctor Chandler and his cotton field taken in 1902, reproduced on page 241. An Arizona writer (McClintock in Arizona Producer, March 1, 1933) reports a field near Buckeye, Arizona, planted to the experimental Yuma in 1908, grew plants twelve feet high; step-ladders were used for picking. This was one reason why the Yuma seed was not placed with farmers commercially until 1912.
cotton, requesting that spinning tests be made. The sum of the opinions were decidedly favorable to the Arizona-grown cotton, and resulted in this conclusion:

It is . . . no longer a question whether a good grade of cotton of this type can be produced in the Southwestern states. The problem that remains to be worked out is whether the economic conditions of the region will justify farmers in undertaking the growing of any kind of cotton.21

In view of the 1907 results, the possibility of establishing an Egyptian cotton culture on a commercial scale in the irrigated valleys of the Southwest received increased consideration. Officials estimated that with new reclamation projects under way as authorized under the Newlands Act of 1902, there would soon be 600,000 acres of land under ditch in the Yuma, Salt, Imperial, and Gila Valleys, and that if one-fifth of this acreage could be used to grow Egyptian cotton, production would equal annual imports from Egypt. (The 1908 imports of Egyptian cotton were 136,900 bales, valued at $12,627,206).

Forty Acres Planted in 1908 Experiments

In 1908 about forty acres were planted to Egyptian cotton, the largest acreage yet attempted. Five acres were

grown on the reclamation experimental farm at Yuma where trials had been conducted since 1902, but the largest planting (nineteen acres) was made on the Pima Indian reservation at Sacaton under a cooperative arrangement between the Agricultural Department and the Indian Affairs Office of the Department of the Interior. Two acres were seeded at the Indian school farm at Phoenix, and about four acres put in by individual farmers, chiefly in the Gila valley, west of Phoenix.

The year 1908 was not a favorable crop year and only twelve bales of extra-long staple were harvested. In the main, however, the 1908 experiments were considered favorable, but further experimental work was deemed a necessity before seed could be safely distributed to farmers for commercial use. 22

In the early autumn of 1908, Orator F. Cook, Argyle McLachlan, and Roland Meade, Bureau of Industry scientists, spent several weeks at Yuma and Sacaton, studying the variations of the Egyptian plantings in the process of acclimatization. John A. Walker, an expert classifier of Egyptian cotton, supervised the baling of the twelve bales harvested, taking care to get uniformity in each bale. At Yuma, with a five-year history of acclimatization, the acre

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yield was higher (604 pounds of lint) and the quality superior (19.1 per cent graded one and two), than cotton grown on the reservation. The nineteen acres at Sacaton averaged slightly over a half bale to the acre (263 pounds) and the best quality graded three (thirty-six per cent) and most fell into grade four (sixty per cent.)

The report prepared by Messrs. Cook, McLachlan, and Meade after their studies at Yuma and Sacaton in the fall of 1908, technical in nature, cited four causes of diversification in growth, arising from different physiological factors: (1) hybridization, (2) incomplete acclimatization, (3) differences in physical environment, and (4) variations in the same plant.

In 1906 and 1907 several plots of upland cotton were grown alongside the Egyptian-type plantings at Yuma to test their productiveness and general adaptability in comparison with one another. The report summary laid down a principle which was to receive increasing emphasis in succeeding years:

.. .considerations make it evident that upland cotton must either be excluded from regions where Egyptian cotton is grown, or local sources of supply of pure, acclimatized seed must be established and very carefully guarded from contact with upland cotton if commercial

23Ibid., pp 9-10.
cultures of Egyptian cotton are to be permanently maintained in Arizona and the neighboring states.24

The 1908 experiments resulted in the identification for the first time of three American-Egyptian varieties, distinct from the parent Mit Afifi, originally grown at the Carlsbad nursery and transplanted to Yuma in 1906 after 1905 floodwaters of the Colorado had wiped out the Yuma test plots. The new varieties carried Arizona names taken from the locales of their inception: Yuma, Somerton, and Gila. The Yuma became the first American-Egyptian variety to be grown commercially. The Somerton was discarded because of excessive growth of vegetative branches. The Gila, bred at Sacaton by E. W. Hudson, superintendent of the Gila Indian reservation farm, was preserved and used exclusively for plantings on the Indian reservation.25

24 O. F. Cook, Argyle McLachlan, and Rowland M. Meade, A Study of Diversity in Egyptian Cotton (USDA Bureau of Plant Industry, Bulletin 156, July 24, 1909), p. 54. Cook continued his interest in the development of the American-Egyptian cotton industry and was a leader in promoting the idea of one-variety communities for cotton. McLachlan transferred his interests to the Durango crop in the Imperial valley. Meade developed the high quality Meade cotton which promised to replace Sea Island until hybridization with uplands destroyed its potentialities.

25 Thomas H. Kearney, "Mutation in Egyptian Cotton," USDA Journal of Agricultural Research, (II, 1, July 15, 1914) pp 294-295. From the 1908 progeny row of the Gila, a half acre was planted in 1910, gradually increased until 1913 when 200 acres of the variety were grown on the Pima and Maricopa Indian reservations, where its production was confined.
The birth of the Yuma variety was related by Doctor Kearney before a luncheon club at Tucson on June 4, 1920, two days after he had received the honorary degree of Doctor of Laws from the University of Arizona for his work in developing the Pima cotton industry in Arizona:

... in 1908 a progeny row was grown from a plant which had been selected the year preceding. The plants in this row proved to be very different from the Mit Afifi, and decidedly superior in productiveness, earliness, and length and quality of the fiber. It was soon recognized that a new variety had been developed which was altogether distinct from the parent Mit Afifi, and the new variety was christened "Yuma." ... It was grown on a field scale, improved cultural methods worked out, and the fiber was tested by eastern manufacturers. The Department of Agriculture was at last convinced that an American-Egyptian cotton suitable for commercial production was at hand.26

In 1909, four and a half acres at Somerton in Yuma valley and ten acres at Sacaton were planted to the new Yuma variety. To test the domesticated seed in other localities, small plantings were made at four different places in the Imperial valley and at Glendale, California. Uniformly favorable reports were received on

26 Dean D. W. Working, Egyptian Cotton in Arizona, (University of Arizona College of Agriculture, pamphlet), pp 5-6.
samples of the Somerton and Sacaton fiber submitted to a number of buyers and spinners.27

Committee on Southwestern Cotton Culture
Appointed in 1910

A complexity of problems involved the establishment of a new agricultural enterprise in a region thinly populated, lacking facilities for processing, and remote from established markets. Initially the cooperation in developing a new industry in the Southwest was on an informal basis.

Kearney had applied himself to the task of plant-breeding and had opened a new nursery in 1909 at Sacaton in addition to planting field acreage there. While at Yuma he was associated in experiments with William A Peterson, superintendent of the reclamation experiment farms in that area. At Sacaton he was joined by E. W. Hudson, farm superintendent at the Indian experiment station, who later played a major role in establishing the

27Thomas H. Kearney, Breeding New Types of Egyptian Cotton (USDA Bureau of Plant Industry, Bulletin 200, December 23, 1910), pp 8-9. Imported seed of the principal varieties of Egypt were also grown at Somerton and Sacaton in 1909 and none equalled the acclimatized stocks in fruitfulness or in quality of lint. Imported Egyptian seed received during southwest experiments was found contaminated by Hindi cotton, an undesirable type with a short, weak fiber. In 1910, O. F. Cook went to Egypt to make study of this unfortunate condition.
extra-long staple Pima cotton industry in the Salt River Valley, its exclusive home for many years. Cook, Meade, Scofield, and McLachlan had been called in for special surveys.

The early experiments at Yuma and Sacaton had convinced the Department of Agriculture that extra-long staple cotton could be profitably grown in the irrigated valleys of the Southwest. Facilities for continued plant-breeding and the propagation of pure seed were provided on two well-equipped farms at Bard and Sacaton by 1910, but other problems had to be met if successful production was to be realized.

Accordingly, in 1910 the chief of the Bureau of Plant Industry appointed a "Committee on Southwest Cotton Culture" to coordinate the program. The original committee consisted of Carl S. Scofield as chairman, Orator F. Cook, Walter T. Swingle and Kearney. Soon afterward Charles J. Brand, chief of the Bureau of Markets, and Fred Taylor, cotton technologist, and later Doctor K. F. Kellerman, associate chief of the Plant Industry Bureau, became committee members. J. G. Martin, working under Brand, introduced methods of classing and grading the new product. Kellerman succeeded Scofield as chairman when the latter went abroad to investigate possible foreign markets for an American-grown extra-long staple cotton.
Functioning in close harmony, each committee member was authorized to assume responsibility beyond his own field. In charge of western irrigation agriculture, Scofield maintained cooperation with the Bureau of Reclamation but also investigated market conditions here and abroad. Swingle, physiologist in charge of crop and breeding investigations, was in charge of the Sacaton work in cooperation with the Indian Affairs Bureau, including recruitment of Indian labor for picking cotton. Cook conducted investigations of the factors involved in the acclimatization program and took the lead in urging the one-variety community plan for the Salt River Valley. Kearney had charge of the breeding work with Egyptian cotton and the investigation of the effect of alkali and other soil conditions upon the crop. Brand became a member of the committee in 1912 when the problem of marketing the first commercial crop was critical and assumed control of investigations in classing, marketing and transportation, with Fred Taylor in immediate charge.

**1912 Crop of Extra-Long Staple Cotton: 375 Bales**

At the close of the 1911 season, experiments had reached a stage which justified the trial of American-Egyptian Yuma on a small scale by farmers of the Salt River Valley in Arizona and Imperial County in California.
Accordingly, in the spring of 1912 about seventy-five farmers received seed from Sacaton and Bard. Thirty-two farmers in the Salt River valley planted 303 acres; twenty-nine and a half acres were planted on Indian land at Sacaton. In the Colorado river valley north of Yuma, in the vicinity of Bard, nineteen farmers planted forty-four acres. In the California Imperial valley, twenty-five farmers planted 122 acres; in addition, twenty boys directed by Walter E. Packard of the California experiment station each planted a half acre. Near Hechicera, Mexico, south of the Imperial valley, was one field of thirty acres.

About 480 acres came through to harvest. From this acreage, 375 bales of 500 pounds each were picked and ginned. Of the total bales, 262 were in the Salt River valley, seventeen in the vicinity of Bard, and ninety-six in the Imperial valley. The experiment farms at Sacaton and Bard produced twenty-four bales, not included in the above. The average lint per acre was 400 pounds.

In the Salt River valley a large portion of the seed from the 1912 crop was reserved or sold for planting in 1913. In the Imperial valley most of the seed was sold to an oil mill at fifteen dollars per ton, indicating a lack of interest in further production.

Carl S. Scofield, chairman of the Southwestern Cotton Committee, drew this conclusion from the 1912 crop:
The results of the season's work on Egyptian cotton in the Southwest appear to warrant a material increase in the acreage devoted to that crop. It would appear that farmers, particularly in the Salt River valley, will be justified in a further trial of the crop and on a much larger scale . . . In the Imperial Valley the size of the land holdings and the labor supply are such that it appears desirable for the farmers of that community to specialize in a big-bolled and hence easily picked variety of long-staple upland cotton, such as Durango, rather than an Egyptian. In the Salt River Valley, however, conditions appear to be more favorable for the development of a cotton industry on the basis of the Egyptian type. There the land-holdings are generally smaller, the labor supply more abundant, and it has been demonstrated that fiber of very high quality and value can be produced.28

Following the advice of the Committee on Southwestern Cotton Culture, the Imperial and Yuma Valleys gave preference to the Durango long-staple upland and the growers of the Salt River Valley, in proximity to the Sacaton farm, gave close cooperation to plans to expand the extra-long staple industry in Central Arizona.

Before the industry could be established in the Salt River Valley, many important steps had to be taken: A larger number and more efficient ginning facilities would be needed and an oil mill built to dispose of the seed,

28Carl S. Scofield, Egyptian Cotton Culture in the Southwest (USDA Bureau of Plant Industry, Circular 123, April 26, 1913), p. 28. The reason land-holdings were smaller in the Salt River valley was a stipulation in the reclamation project of Roosevelt dam that no-one could own more than 160 acres. Indian labor, trained at Sacaton, was available to Salt River valley farmers.
which made up about two-thirds of the bulk crop. Uniform market grades would have to be established and maintained from season to season. Storage warehouses to hold the crop for advantageous sale must be erected, enabling the grower to borrow against the stored cotton while waiting a favorable market. Precautions against insect damage were necessary. Of supreme importance was the maintenance of an adequate supply of pure seed of high-yielding and uniform variety.

The Department of Agriculture, in its 1912 yearbook, reported that the crop, under research conditions, gave promise of supplying the demand for extra-long staple fiber. Thread makers of Europe were in America inquiring about future supplies, the department reported, concluding: "The market waits for the scientist to do his work." In 1912 American spinners imported 175,835 bales of Egyptian cotton; in 1913, 191,075 bales.

Atha Pioneers Crop Near Phoenix

Herbert B. Atha, a newcomer from New Jersey, pioneered the Egyptian cotton industry in the Phoenix area. In 1911, he planted five acres on his farm, "Esperanza," seven miles northwest of Phoenix in the vicinity of Glendale. Yuma

29 USDA 1912 Yearbook, p. 10.
seed secured from Hudson at the Sacaton farm was planted as directed. The crop of raw cotton was hauled to Sacaton for ginning. He had consulted with friends in New Jersey associated with the American Thread and Clark Thread companies as to the desirability of the extra-long staple. He sold his one bale crop to the Clark company for $100.

In 1912, Atha was the largest grower of extra-long staple in the Southwest. His harvest of 120 bales was the season's record. This crop was too large to haul to Sacaton as he had in 1911 so he set up a two-stand gin in a shed on his ranch where he also ginned twenty bales grown by Indians at Gila Crossing.30

In 1913, Atha incorporated and assumed management of the Arizona Egyptian Cotton Company. He built an eight-stand gin and an oil mill in Phoenix, locating the plant on a spur of the Arizona Eastern railroad. The installation included an office and five buildings, equipped with the latest mechanical devices. Lint, seed, oil, linters, and oil cake were all processed mechanically. Growers' cooperatives operated ginning plants for the Mesa-Tempe and Chandler areas but Atha had the only oil and cake-making plant by 1914.31


The one-variety cotton community plan had strong support from Atha. Citing the 1913 crops of the Salt River valley, growing extra-long staple Yuma, and Imperial valley, growing ordinary long-staple, American-Egyptian producers netted ten dollars more per acre under his analysis. Short cotton was often in surplus in the United States whereas domestic extra-long staple production was always less than the country consumed and consequently was assured of a strong market, he reasoned. He reported shipping 800 bales of Yuma to the American Thread Company in 1913, stating that this one company could easily have absorbed the total Salt River valley crop of 2,200 bales.32

Growers Organize Cooperatives

Community cooperation was needed to secure labor, arrange financing for crops, and to provide a continuous supply of pure seed. Grade and staple standards had to be set to facilitate marketing. Because the American Thread Company had been a willing consumer of the yield from experimental crops, the matter of marketing had only received minor attention prior to 1912.

Farmers in the Salt River Valley were familiar with Egyptian cotton experiments at Sacaton and had consulted

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Superintendent Hudson about the commercial outlook and the methods of growing the crop. In the spring of 1912 about thirty farmers in the Mesa area formed an association to undertake production. The next year growers near Tempe and Chandler formed similar groups.

In 1914, these three local cooperatives formed the Salt River Valley Egyptian Cotton Growers' Association, still maintaining their individual organizations. The central group was planned to function as the marketing agency for the three local units and as the source of pure seed for the entire valley. The local associations built gins and arranged financing for their membership as needed.33

Growers of Tempe-Scottsdale organized in 1914 to increase their plantings from 300 acres in 1913 to 3,000 in 1914. The Tempe Exchange built a ten-stand roller gin and installed a compressor to reduce the size of the bales for economical shipping.

Clinging to the precept that American-Egyptian cotton could only be grown successfully where no other variety is

grown, the Salt River valley had no upland in 1912 and 1913. During the next four years, 1914-17, there were small plantings of the upland Mebane. Only Pima was grown in the Salt River Valley from 1917 to 1921.34

**Cotton Leading Industry of Salt River Valley by 1917**

In 1917 the production of Pima cotton ceased to be a sideline and became the leading industry of the Salt River Valley. This was the first year Arizona cotton production merited attention in the statistics of the Bureau of Agricultural Economics of the Department of Agriculture.

The volume and value of Pima crops during the first six years and approximate per bale price for each year illustrates the effect of a fluctuating market. The 1914 crop was the largest prior to 1917 but brought the lowest bale price:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>BALES</th>
<th>CASH VALUE</th>
<th>BALE PRICE</th>
</tr>
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<tr>
<td>1912</td>
<td>375</td>
<td>$44,000</td>
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<tr>
<td>1913</td>
<td>2,135</td>
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</tr>
<tr>
<td>1914</td>
<td>6,187</td>
<td>$533,000</td>
<td>86.14</td>
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<td>1915</td>
<td>1,095</td>
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<td>1916</td>
<td>3,331</td>
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</tr>
<tr>
<td>1917</td>
<td>15,966</td>
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<td>382.17</td>
</tr>
</tbody>
</table>

34Stewart, op. cit., p. 19 and table II, p. 28. Mebane acreage during years upland grown: 1914, 2,000; 1915, 300; 1916, 1,000; 1917, 260.

The bale return for the 1914 harvest of Pima cotton ($86.19) was discouraging to growers and resulted in lower acreages for 1915 and 1916 than was planted in 1914. The war declarations of August 1914 precipitated sharp declines in all cotton prices. Upland growers took more severe losses on their 1914 crop than did Pima cotton growers.36

The extra-long staple cotton came to sharper attention and greater popularity with growers in 1916 due to the prices commanded by this variety in 1916. The bale return for the season ($233.53) was almost double that of the previous year ($118.40).

The 1917 Pima cotton acreage of 27,000 more than doubled to 69,000 in 1918, then increased to 82,000 in 1919, and 182,000 in 1920 in Maricopa county, which represented three-fourths of all the irrigated land in the Salt River Valley.

A total of 243,000 acres was planted to Pima in 1920: 200,000 in Arizona and 43,000 in California. Never since has so much acreage been planted to Pima cotton, although improvement of varieties, aided by modern technics of

36USDA 1915 Yearbook, pp 12-13. The declaration of war on August 1, 1914, brought the fear that the big United States exports of cotton would be stopped or curtailed. The August 1 price of 12.5 cents per pound dropped almost half to 6.3 cents by November 1. Cotton exchanges were closed until December. The nation's 1914 crop, fourteen per cent above 1913 in volume, was valued at $283 million less, a decline of over forty per cent. The Pima market survived the crisis comparatively better.
of farming, brought higher yields per acre in 1952, during the Korean war.\textsuperscript{37}

Bringing American-Egyptian cotton to its high state of production in less than a decade after the first commercial crop of 1912 was a near phenomenon involving numerous problems attendant on a new enterprise in an area thinly populated, with limited facilities of production, and growers with no past experience. The industry literally started "from scratch."

Because war temporarily shut off foreign imports, the demand for extra-long staple production was unexpectedly heavy, in the early years of the new industry. The problems of the infant industry, in its first five years, included recruitment of adequate labor, setting up standards of grade for marketing, classifying by staple length, marketing and transporting to the regions of consumption, and continually guarding the purity of seed to protect the future of the new enterprise.

\textsuperscript{37}USDA Agricultural Marketing Service, Cotton and Cottonseed (Statistical Bulletin 164, June 1955), table 38, p. 41. The 1920 acre yield was almost the lowest since production started: 189 pounds; the 1952 acre yield of the American-Egyptian Pima 32 was 425 pounds. The total acreage for the 1952 harvest was 108,200 compared to 1920's 243,000. The volume for these years: 1920, 91,700 bales; 1952, 95,000.
For thirty-two years, "Bob" Peebles worked with Pima cotton at the United States Department of Agriculture field station located at Sacaton on the Gila Indian reservation in Central Arizona. He learned the science of breeding cotton from practical application under the tutelage of T. H. Kearney and George J. Harrison. Two of his varieties reached commercial production: Amsak and Pima 32. Although lacking a formal scientific education, he became a most successful breeder and an effective leader in the industry.

The above picture shows Kearney, pioneer cotton breeder of the Bureau of Plant Industry, with a specimen of Egyptian-type cotton grown at Yuma in 1907. Kearney started his program of acclimatization and breeding at Yuma in 1902 after he and Thomas Means of the Bureau of Soils had spent some time in Egypt checking soil and weather conditions and cotton-growing processes. The primitive facilities as compared to present-day equipment is evident in the photograph. His home was a tent and the wash-tub and pump his water supply. Four varieties, in commercial production from 1912 to 1950, were products of his work at Sacaton. He and Peebles collaborated on a monumental work, "Flowering Plants and Ferns of Arizona," published by USDA in 1942.
CHAPTER VII.

PROBLEMS OF INFANT PIMA COTTON INDUSTRY

Even at the time that the Yuma variety of American-Egyptian cotton proved to have the qualities needed for successful commercial production, the industry was far from established. Seventy-five farmers spread over a wide area had grown 375 bales of the extra-long staple in 1912, and it was believed to be a favorable cash crop for the Salt River Valley where the greatest success had been attained. The Southwest Cotton Committee had determined acreage returns were high and the fiber would not deteriorate in value because of the necessary long haul to markets on the eastern seaboard.

Yet for production to reach its highest potential, a sufficiently large acreage would be needed to pay for the installation of machinery for ginning, baling, and compressing equipment. Volume would be necessary to earn car-lot transportation rates.¹

¹J. G. Martin, The Handling and Marketing of the Arizona-Egyptian Cotton in the Salt River Valley (USDA Office of Markets and Rural Organization: November 26, 1915), p. 12. In January 1914, a Boston broker received a ten-bale trial order from a Fall River, Mass., mill and passed it on to the Salt River Valley Growers Association. The order was filled from a consignment to Liverpool previously sent there, saving $15 per bale ($3 per hundredweight; $150 saving on the ten bales) and delivery effected sooner than if shipped from Mesa. The carlot rate Mesa to Galveston in 1914 was 95¢ per hundredweight; the local rate was $2.50; to which must be added water rates to New England. The consignment to Liverpool, a car-lot, from Mesa to Galveston by freight and trans-ocean, and back to New England, cost $1.63 per hundredweight.
The Committee of Southwestern Cotton Culture from the beginning of experimentation recognized that the high cost of picking the Egyptian-type cotton would be one of the difficulties to surmount. Bolls were smaller than in the upland and it was important, if quality lint was to be produced, to pick cleanly, avoiding trash and pieces of extraneous matter. Hand labor was neither abundant nor cheap.  

Growers of the Salt River Valley had to pay two dollars per 100 pounds for picking seed cotton while the prevailing rate in the Imperial Valley was one dollar for the larger-bolled cotton.  

Yet in spite of labor scarcity, the problem of picking the extra-long staple was successfully met by a community of effort in the early years of production.

The committee selected to develop the industry had interested the Pima Indians near Sacaton not only in growing cotton for themselves but also in aiding white settlers in picking the crop. Papago Indians in southern Arizona also became pickers. In 1913 about $20,000 and in 1914 about

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2 Based on the 1910 census, there were less than two persons (1.8) to every square mile of Arizona's area; state's 1910 population was 204,354. In 1908, Kearney and Peterson (USDA Bulletin 128, p. 57) expressed the belief that the best chance of establishing the industry in the region was "on the basis of two to five acres for each farm, the farmer's family supplying most of the labor needed."

3 Scofield, and others, op. cit., (332), p. 16.
$37,500 were paid to the Pima and Papago tribes as wages for picking cotton in the Salt River Valley. These earnings were augmented by crops grown on reservation lands, bringing total Indian earnings from cotton to $40,000 in 1913 and $50,000 in 1914. It was estimated that in the 1914-15 season a total of $150,000 was paid out in wages to cotton pickers.4

Oklahoma-Texas Pickers for 1913 Crop

The ten-fold increase of acreage in 1913 over the preceding year brought concern to growers that it would be impossible to secure competent pickers. The Salt River Valley Egyptian Cotton Growers' Association began a campaign of letter-writing and newspaper advertising in Oklahoma and West Texas. Because drought had lowered the 1913 crop in these areas, more than 300 growers emigrated to Arizona by October, 1913, in response to the letters and advertising. There was a lasting effect in this campaign:

Many of these new citizens of Arizona will make permanent homes here. A number came early with sufficient funds to carry them for a year, rented farm lands on shares, and have raised a crop that is proving profitable to both tenants and landlords.5

Caution against large planting was early stressed. Harry

4Ibid., fn p. 17

Welch of the Phoenix Board of Trade, warned against large-scale operation until the problem of labor was settled. He commended the ten- to forty-acre farm, cultivated and cropped by the owner and his family, "as the means to progress and prosperity."  

Labor problems at best, were provocative, and as acreage and volume increased became more so. In the first years the Salt River Valley Egyptian Cotton Association in cooperation with the Southwestern Cotton Committee was able to get the cotton picked by the white settlers from Texas and Oklahoma, Mexicans, and Indians from the Pima and Papago reservations. Later, labor problems were assumed by the Arizona Cotton Growers' Association, formed especially for that purpose.

A large part of the crop in 1913 and 1914 near Mesa and Tempe was picked by Indians trained at Sacaton. The Indians were slow but good pickers, not concerned with high wages at the expense of quality. As a consequent, the Mesa and Tempe cotton rated high in tests conducted by the Bureau of Markets in these years.  

6 Arizona State Magazine, July 1913, 1. 13.

7 J. G. Martin, Handling and Marketing Arizona-Egyptian Cotton in Salt River Valley, (USDA Bulletin 311, November 26, 1915), p. 2.  E. W. Hudson, superintendent of the Sacaton farm, commended Indian laborers: "The most important supply of labor for cotton picking in Arizona is afforded by Papago and Pima Indians...5,000 to 7,000 in these tribes who promise by virtue of their industry, patience and honesty to play a most important part in establishing the cotton industry." (USDA Farmers Bulletin 577, March 14, 1914, p. 8).
Classing and Grading Program in 1913

No standards for staple or grade existed for the Arizona-Egyptian cotton at the time of the first crop of 1912. Commencing in the fall of 1913 the cotton section of the Federal Bureau of Markets at the request of the Southwestern Cotton Committee undertook an intensive study of the new industry, including the condition of the cotton in the field, method of picking, handling, storage on the farms, ginning processes, and the loading into cars for shipment to eastern markets.

Grades were determined by the amount of leaf, hulls, and foreign matter in the bale, the color and silkiness of the lint cotton, and the amount of boll stain and dead cotton. The staple was based on length, strength and uniformity of the fiber. Grades were classified as fancy, extra, choice, standard, and medium.

Three staples were established based on comparisons with equivalent varieties of Egyptian cotton: (1) Sacaton equal in length to the best imported Sakellaridis; (2) River equivalent to the best Jannovitch; and (3) Valley equal to the best Mit Afifi.8

This comparison was subsequently approved by eastern mills, brokers throughout New England, by merchants in England, by

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8Ibid., p. 9, The New Bedford, Mass., fine goods mills called the Sacaton staple 1-7/16 to 1-1/2 inches; River, 1-3/8 to 1-7/16 inches; Valley, 1-1/4 to 1-5/16 (now the established length of ordinary long staple).
France, and Germany and by the chairman of the arbitration committee of the Liverpool Cotton Association.

The 1913 tests were run at the gins at Mesa, Chandler, and Glendale, and in 1914 at Mesa and Tempe because the Chandler gin had passed to private ownership, and the Glendale association planted short staple and changed its equipment to the saw gin instead of the roller gin required for extra-long staple cotton.

The highest grades and staples were grown in the Mesa area. In the two years, of the 2,647 bales graded and classified, 1,475 graded Sacaton, 1,147 River and only twenty-five below extra-long (the Valley staple).

In 1913, 317 bales were classified at Chandler: Sacaton, 70; River, 169; Valley, 78. Only 108 bales cleared the Glendale gin: Sacaton, 14; River, 82; Valley, 12. The 1,237 bales classified at Mesa were: Sacaton, 892; River, 326; and Valley, 19.

The tests for 1914, confined to Mesa and Tempe, were: Mesa, of a total of 1,410 bales: Sacaton, 583; River, 821; Valley, 6. Tempe, of total of 1,285 bales ginned: Sacaton, 493; River, 784; Valley, 8. The class standard was not met, however, on 123 of the Tempe bales of these staple lengths: Sacaton, 7; River, 115; Valley, 1; and 74 Mesa bales stapling: Sacaton, 10; River, 60; Valley, 4.9

9Ibid., pp 9-10 and 15.
The various gins showed these classifications:

<table>
<thead>
<tr>
<th>GIN</th>
<th>YEAR</th>
<th>FANCY</th>
<th>EXTRA</th>
<th>CHOICE</th>
<th>STANDARD</th>
<th>MEDIUM</th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>Chandler</td>
<td>1913</td>
<td>3</td>
<td>93</td>
<td>70</td>
<td>118</td>
<td>33</td>
<td>317</td>
</tr>
<tr>
<td>Mesa</td>
<td>1913</td>
<td>36</td>
<td>466</td>
<td>389</td>
<td>274</td>
<td>72</td>
<td>1,237</td>
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<tr>
<td>Glendale</td>
<td>1913</td>
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<td>6</td>
<td>41</td>
<td>61</td>
<td>108</td>
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<tr>
<td>Mesa</td>
<td>1914</td>
<td>1</td>
<td>210</td>
<td>482</td>
<td>414</td>
<td>229</td>
<td>1,410*</td>
</tr>
<tr>
<td>Tempe</td>
<td>1914</td>
<td>3</td>
<td>128</td>
<td>384</td>
<td>398</td>
<td>251</td>
<td>1,285*</td>
</tr>
</tbody>
</table>

*Mesa had 74 bales and Tempe 123 bales below class.

The classing and grading was an essential to market stabilization and uniform pricing. On the basis of the two years of testing, some of the largest cotton firms, spinners and exporters, indicated that the quality, staple and characteristics of the new American-Egyptian Yuma was such that a permanent market should result.10

Arizona's extra-long staple production having shown a remarkable increase in the first three years of commercial growth (in 1912, 280 bales; 1913, 2,200 bales; 1914, 6,187 bales), it was considered important to gather facts on its spinning qualities. Accordingly, in summer of 1915 tests were run at the New Bedford (Massachusetts) Textile School under the direction of Fred Taylor, federal cotton

10 Ibid., p. 16. In 1916 and 1917 the cotton branch of the Bureau of Markets conducted similar investigations because the new Pima variety, a longer and lighter-colored fiber, required new standards of grade and staple.
technologist. Different grades of the Arizona-Egyptian cotton were compared to each other and with the Egyptian Sakellaridis and Sea Island cottons. The characteristics as to spinning qualities included tests on waste, tensile strength, bleaching, mercerization, dyeing and finishing. Comparisons of grade, staple, and price also were made.

These conclusions were announced as a result of the most thorough of tests:

. . . our domestic cottons are equal to, and in most respects superior to, imported cottons. . . . Laboratory tests indicated that after bleaching, dyeing, and mercerizing, the Arizona-Egyptian and Sea Island cottons were practically equal to each other and were slightly superior to Sakellaridis in their bleaching and mercerizing properties; and in tensile strength the advantage was slightly in favor of Sea Island and Sakellaridis.11

As to spinning qualities, the tests showed no superiority of any one over another.12 In cottons under test, Arizona-Egyptian was found considerably less wasty than Sea Island, which was considerably less than Sakellaridis.13 Samples of the tested cotton were sent to brokers of good standing for evidence of value, and the market price as of the day submitted did not vary more than a

12Ibid., p. 3
13Ibid., p. 6.
half-cent per pound for the Arizona-Egyptian, Sea Island, and Sakellaridis.\textsuperscript{14}

Although the Southwestern Cotton Committee had succeeded in developing a cotton of superior qualities, equal to any extra-long staple, the marketing of this product presented many new problems. Manufacturers experimenting with the Arizona-Egyptian cotton had found it less wasty and were satisfied that it could be substituted satisfactorily for most purposes for uses served by imports.\textsuperscript{15} But they were hesitant to make a change in a profitable business. The lower percentage waste was of little concern to the converter and the consumer. When placing contracts, the converter was familiar with Sea Island and Egyptian cottons from long experience and usually specified one or both of these varieties. Mills were not inclined to adjust machinery to a new product with no assurance of a continued ample supply.

\textbf{Dorman Experience in Marketing New Product}

The 1913 crop of Arizona-Egyptian cotton totaled 2,135 bales. Its sale was the first test in the marketing field of any sizeable quantity inasmuch as the first

\textsuperscript{14}\textit{Ibid.}, p. 4.

\textsuperscript{15}\textit{Ibid.}, p. 7. Cotton listed as waste is not actually lost to the spinner; the greater part is reworked in the making of a cheaper class of merchandise.
commercial crop of 1912 was only 375 (280 in Arizona) bales. Fifteen bales from the 1909 experimental crop were sold in March 1910 under bids at thirty-one cents and thirteen bales from the 1910 crop were sold in April 1911 for twenty-eight cents. The prevailing prices for upland in these months were fourteen to fifteen cents. The American Thread Company made the purchases.

In 1913 the Southwestern Cotton Committee, made up of agricultural department personnel, was invited to meet with members of the Arkwright Club of Boston, an organization of the leading spinners of New England. Types of American-Egyptian cotton were shown and the qualities of the cotton and other phases of the industry were discussed. The committee reported that members of the club were favorably impressed with the new extra-long staple crop of Arizona.

In January 1914, the Salt River Valley Egyptian Cotton Growers' Association, collaborating with the Southwestern Cotton Committee, sent W. S. Dorman, president of the association and the Mesa cotton exchange, to New York, Boston, Providence, and other consumer areas of Egyptian cotton. Carl S. Scofield, former chairman of the federal cotton committee, had previously investigated the European markets,

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16 Carl S. Scofield, Suggestions on Growing Cotton in the Southwest, (USDA Bureau of Plant Industry pamphlet: January 9, 1912), p. 2
17 Martin, op. cit., p. 11.
and it was planned that Dorman would also go to England, France, and Germany to introduce the new American extra-long staple. The war declarations of August 1914, however, forced cancellation of the projected voyage.

The Dorman trip revealed the problems involved in presenting a new product. The Mesa cotton exchange president found that practically no one in the cotton centers of the world had heard of Arizona-Egyptian cotton except the American Thread Company of New York, buyers of the first-grown experimental crops. He commended this company as among the most careful of buyers in New England, but American Thread could use only a portion of the 1913 crop. He had expected, "in the natural course of events," that when Arizona-grown Egyptian cotton production reached 2,000 to 2,500 bales, staple cotton buyers should have been attracted to Arizona "because of a natural demand for this superior cotton." 18

Among other things, Dorman learned on his eastern trip that women's fashions had dealt the cotton industry a hard blow in 1913 by making five yards of material do what formerly required ten to twelve yards of fine fabric. Good mills were compelled to buy cheap cotton to make cheaper goods because of a financial depression. Uncertainty of tariff measure, Arizona's inaccessibility to

established markets, and high freight rates were given as other handicaps to the growers of the Southwest.

Dorman expressed the belief that the marketing of the Arizona-Egyptian cotton crops in the Salt River valley had been seriously overlooked prior to 1914. He compared Arizona's situation in the cotton market to a merchant who places his wares in an inaccessible corner of a warehouse out of sight of probable customers—not a good sales promotion.

Given authority to sell the 1913 crop or to make the best possible arrangements possible for all cotton belonging to the cooperative exchanges of the Salt River valley, Dorman found the best price was that obtained on the Liverpool market for a consignment of fifty bales which sold in competition with Egyptian varieties at twenty-three and a half cents. The top price received on the home market was twenty-two cents. One hundred and fifty bales were sold outright at twenty-one and a half cents and the balance of the Mesa cotton was consigned to responsible brokers.

On March 14, 1914, George H. MacFadden & Brothers of Providence, Rhode Island, handling the bulk of the consigned cotton, wired the Mesa exchange:

Have disposed of several additional trial orders since our last report. Do not expect to have any difficulty in placing every bale. Glad to note the increase in acreage as think a market can be found for every bale grown in the valley.19

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19 Ibid.
Dorman returned from his eastern marketing foray with the sincere conviction that Arizona had a superior product not fully appreciated by the home growers to whom he expressed these views:

After one has seen scores of expert cotton classifiers examine Arizona-Egyptian cotton and listened to their comments without hearing a discouraging remark, after the one concern which has tried it thoroughly in their mills and want all they can use of it and have only words of praise to offer; after it has sold in England, the great staple cotton market of the world, for one cent above Sakellaridis which variety is regarded as the very best of Egypt's production, it is fair to assume that this cotton has real merit. On this point there can be no doubt. Arizona-Egyptian is among the finest cotton that is grown in the world, and is really less appreciated by the residents and growers of this valley than in any place on earth.20

Marketing Under 1914 War Conditions

If the year 1913 encountered abnormal conditions because women used less material for their dresses and the cotton market was a bit in the doldrums, the year 1914 was to add to the abnormality with a war of world-wide scope which European powers declared in August 1914. The war declaration sent upland cotton prices plunging downward. The price to farmers on August 1, 1914, was 12.4 cents per pound; by November 1, it had dropped almost one-half to 6.3 cents per pound. The 1913 average return

20 Ibid.
to producers was 12.5 cents per pound; the 1914 return averaged 7.3 cents per pound.21

In view of the situation in the upland cotton market in 1914, the growers of Arizona-Egyptian fared comparatively well. In late August 1914, after the war declaration, the Salt River Valley Egyptian Cotton Growers' Association sold 200 bales at prices equivalent to sales of similar grades the year previous: 22 cents for extra, 21 cents for choice, and 19½ cents for standard grade. On September 10, 1914, eastern brokers agreed to take 500 bales on consignment, advancing 15 cents on extra, 14 cents on choice, 13½ cents on standard, and 12 cents on medium, f.o.b. Mesa. On September 15, a second sale of 200 bales of standard was sold at a slight decline from the August sale, and another 200 bales at one-cent lower.

On September 19, 1914, a second consignment of 1,000 bales was arranged with eastern brokers. A few days later this consignment was converted to an outright sale at approximately four cents less for each grade than was paid in the first sale. Later, a further compromise was necessary when rains limited the delivery of choice and higher grades and a consignment of 100 bales arranged on

December 30, 1914, was applied to this sale at a price of 15 cents f.o.b. eastern points.  

The Salt River valley growers encountered new hazards in late 1914: the elements and foreign imports. The October rainfall was the heaviest the valley had known in years and a slow, light rain began on December 17 and continued until December 28. When it seemed that shipping was safe from Egypt to England and from England to the United States, an influx of low-priced cotton from Egypt was unleashed. This grew to a pre-war peak of 350,000 bales in 1915.  

In spite of unfavorable conditions, the market for extra-long staple continued fairly steady, but the Arizona association, unable to supply demands, was forced to limit orders because of inability to guarantee delivery of the higher grades. The new industry had not provided protection of its crop against excessive rains and did not realize what a loss in value resulted. Brokers reported difficulty in selling grades of medium or lower. Later in the season the local exchange at Tempe sold for the central association 100 bales below the medium grade at fourteen


cents f.o.b. Phoenix, and fifty bales of Mesa "rain cotton" and smaller amounts brought $15\frac{1}{2}$ cents at eastern points.  

The 1914 crop was marketed under unfavorable conditions at fairly good prices at a time when the industry as a whole was demoralized by a war that disrupted normal channels of trade. Although all the 1914 crop found a market, even the rain-soaked crops, the declining prices discouraged acreage expansion for 1915. Only 2,600 acres, one-fifth the 12,500 acres of the previous year, were planted to Egyptian-type cotton in 1915. The Southwestern Cotton Committee viewed the acreage shrinkage as advantageous. The too-rapid expansion of 1914 had taxed the resources of the growers' association in providing pure seed, and 1915 was viewed as a time to recoup and continue on a firm basis.

There were no new problems in marketing the 1,095 bales grown in 1915. The market had strengthened and growers received an average of thirty dollars per bale above the 1914 returns.

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26 The University of Arizona College of Agriculture, 27th Annual Report, year ending June 30, 1916, reported: "Egyptian cotton this year has yielded a handsome profit on the new station farm between Mesa and Tempe . . ." (p. 243).
Cotton Brokerage Firm at Tempe in 1916

The year 1916 witnessed the location of an eastern cotton broker's agency at the source of Arizona-Egyptian cotton. E. A. Shaw & Co., a Boston brokerage firm, opened an office at Tempe to buy cotton directly from farmers and ginners for its mill customer in the South­eastern and the New England states. The Shaw company be­came specialists in extra-long staple cotton and have been consistent promoters of the industry in the Southwest. Of some 250 bales of the new Pima variety, brought into pro­duction in 1916, Shaw bought 179 bales for test purposes, distributing Kearney's new variety to mills on the eastern seaboard. The new Pima sold up to 58 cents per pound ginyard while the Yuma brought only 27 cents to 50 cents per pound.27

American-Egyptian production in the Salt River valley in 1916 was 3,311 bales, three times the crop of 1915 but

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27E. A. Shaw & Co., American-Egyptian Cottons, (Boston: May 1950), p. 6. In 1933 W. K. Shaw, Jr., planted 3,500 pounds of seed furnished by the Sacaton field station under special contract which was the first commercial crop of the SXP variety. SXP (Sakellaridis crossed with Pima) was whiter and produced stronger ply yarn than Pima and by 1941 had replaced the Pima. In 1942 the SXP production was 73,808 bales grown in Arizona, Texas, and New Mexico. During World War II the government controlled production and restricted its use to military textiles and sewing thread.
about half the 1914 harvest. The 1916 prices started at 30 cents per pound, rose rapidly to 47 cents, and by November reached 53 cents. By fall, the high prices and rumors of large land purchases to grow Egyptian cotton presaged an impending expansion in the industry. After 1916, the marketing problems appeared to have been solved. The market had finally come to the home of American-Egyptian production. In the next few years, attention centered on growing every possible bale of the extra-long staple to supply eager buyers.

**Ginning and Storage Standards**

A distinctive feature of the extra-long staple industry is that roller gins must be used to preserve the fine texture and strength. Because output is about half that of the saw gin used for upland, higher gin costs result.\(^{28}\) The Callaway Textile Dictionary gives this description of the roller gin:

> A type of gin based on the principle of the ancient Churka gin. The modern roller gin is small and simple in construction; the essential parts consist of a roller covered with rough leather, and a knife set so that its edge is parallel to the roller and barely

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\(^{28}\)Stewart and cotton committee, *op. cit.*, table IV, p. 30. The cotton committee set the price of roller ginning at 90 cents per hundred pounds and saw ginning at 45 cents per hundred pounds in determining costs in Maricopa county, 1922-27.
touching it. The locks of seed cotton are fed to the roller, the lint clings to its rough surface and passes under the knife where it is stripped from the seed which cannot pass under the knife. Considered better than a saw gin for long staple cotton as it does not cut the fibers; however, the production is low.  

With the start of the extra-long staple industry in the Southwest, new phases of ginning problems were encountered. Several types of gins were employed in the different ginning establishments of the Salt River valley with various kinds of cleaning and handling devices, some carried over from saw gins with which many of the operators had their previous experience. The diversity of mechanical equipment resulted in different appearances of the ginned product, depending on how it was handled in the process. The essential uniformity acquired by careful seed selection, though present, appeared to be lost because treatment in ginning was not uniform.

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29 W. L. Carmichael, George E. Linton, Isaac Price, Callaway Textile Dictionary (LaGrange, Georgia, Callaway Mills: 1947) p. 298. The saw gin is defined as: "A type of cotton gin in which fibers are pulled away from the seed by the action of rapidly revolving saws. . . . This type is used for most American cotton." As of 1959, there were 121 saw gins and seventeen roller gins in Arizona.

30 In the first edition of The Producer, published March 15, 1922, the Arizona Pima Cotton Growers, on the front cover of their official paper, indicted itself for faulty ginning in these words: "Pima cotton . . . has always reached the delivery point at mills in a disgraceful condition, with bagging badly torn, bands missing, and ragged . . ."
Federal cotton investigators checking the progress of the new industry in 1915 noted these shortcomings: lack of storage facilities, exposing seed and ginned cotton to rains with resultant spoilage and loss of grade; faulty ginning permitting crushed seed in the cotton; insufficient covering of baled cotton, lack of side strips and head coverings. One gin used second-hand sugar bags as a wrapper which was found too light in weight, rotted easily, and afforded little protection.

The industry was undertaken prior to the days of general motorized transportation. The majority of farmers lived far from the gins, and it was costly for them to haul a fraction of a wagonload there. Without storage capacity or seed-cotton houses, the cotton was piled on the ground, exposed to heat, heavy dews, and rains. After loaded with cotton, the wagon stood in the field, the barnyard, and the gin, subject to further exposure. Damp or wet cotton produced a curly and matted condition, lowering grades materially. 31

New Pima Variety in 1916

The strengthening of prices for American-Egyptian cotton in 1915 and an aroused interest among growers as to its possibilities furthered plans for close cooperation

31 Martin, op. cit., p. 3.
among growers, the Southwestern Cotton Committee, the University of Arizona College of Agriculture, and the Salt River Valley Cotton Growers' Association. E. W. Hudson, who had been in the forefront of the extra-long staple program in the Salt River Valley since the opening of the Sacaton farm in 1907-08, joined the university extension service, planning to devote full time to visiting growers and holding public meetings, advising and issuing material on methods of planting, growing and harvesting the crop.

In 1910, Kearney discovered a plant of the Yuma variety at Sacaton which had distinctly better fiber than the general run and from this was propagated the new Pima variety which became the main species grown from 1919 to 1939. The name "Pima" became the accepted generic term for all Southwest-grown extra-long staple cottons during the twenty years of its predominance and ever since. Compared with the Yuma, which it replaced, the Pima "was much less limby, had better fruiting branches, the bolls were of different shape and plumper, and the fiber was longer, silkier, and lighter colored." 32

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32 Working, op. cit., p. 7. The words quoted were used by Kearney speaking in Tucson at the time he received his honorary Degree of Doctor of Laws from the University of Arizona in June 1920.
Field tests had shown that the Pima was thoroughly stable and uniform after repeated field and spinning tests, and that it was more productive and earlier maturing than the Yuma, and the lint grew at least one-eighth longer than the earlier variety.

A 1916 problem was how to substitute the new Pima for the Yuma variety, already in commercial production, without mixing the seed of the two varieties. The transition was undertaken through the well-organized association of growers of the Salt River Valley, using the modern gin facilities of the Tempe Exchange, built in 1914 by extra-long staple growers.

The exceedingly great care taken to maintain seed purity was related by Kearney:

... in 1916 several members of the exchange whose ranches adjoined, planted a few hundred acres with Pima seed, in fields which were considered sufficiently isolated from the nearest Yuma cotton. The Pima cotton thus produced was ginned in special runs, the gins having been thoroughly cleaned beforehand, and the seed carefully stored in sealed sacks. Several thousand acres in a compact body were planted with this Pima seed in 1917, and in 1918 the supply was sufficient to plant almost the entire acreage of the American-Egyptian cotton. The replacement was completed in 1919, when the Yuma variety practically disappeared from commercial production. This year 1920, it is estimated that about 225,000 acres of irrigated land in Arizona and California have been planted to Pima cotton. 33

33 Ibid.
Tire Company Forced to Grow Own Cotton

First signs of an incipient boom in the extra-long staple became evident in late 1916. The January 1917 issue of Arizona State Magazine described a growing tenseness:

During the last three months the Salt River Valley has lived in a state of ecstasy over the promised realities of the cotton industry. . . . Rumors have been current for two or three months of large corporations leasing or buying lands for cotton growing, and guarantees of high prices to those who would contract to market their crops . . . The Arizona Magazine is now pleased to make announcement of a specific fact which is a beginning of this realization and is an incident of no mean importance. . .

To the non-resident reader only, it is necessary to say that this land will be made productive only through irrigation; and likewise, to both the home and distant reader, it is added that the means of irrigation will be the pumping plant . . .

The specific fact revealed by the state paper was that the Goodyear Tire & Rubber Corporation of Akron, Ohio, had purchased two tracts of Arizona desert land, 8,000 acres of Doctor Chandler land lying twenty-seven miles southwest of Phoenix (called Goodyear, later Ocatilla), and the Beardsley "pumping proposition" tract and some adjoining land totalling 16,000 acres, eighteen miles west of Phoenix (first called Litchfield ranch and later the site of the

34"Goodyear Cotton Plantation, "Arizona State Magazine, VII, January 1917, p. 3."
attractive town, Litchfield Park). The corporation hurried to plant 1,500 acres to Egyptian-type cotton in the 1917 season.

The coming of the Goodyear company to Arizona to grow extra-long staple brought a new era to the industry and hastened its development. Many of the early problems--market outlets, efficient gins, adequate storage facilities, importation of labor, money to grow crops--seemed to be met all at once by the tire company that came to Arizona to buy cotton and found it necessary to grow it also. The shortcomings and problems so evident in the early history of the industry ceased to exist with the application of the capital and "know-how" of big business, forced to grow vitally-needed cotton when local growers were unable to supply the required volume.

Ibid. Joseph R. Lofthus, formerly living in the Imperial valley and for the preceding two years general manager of Chandler Improvement Company, Chandler, Arizona, and a resident of Phoenix, handled the transaction. Most of the land originally had been acquired from the public domain by scrip. Aside from the large Beardsley tract, the private holdings of some fifty private owners were involved. Average sale price was reported to be twenty-seven dollars an acre. Some portions had been cropped two or three years but most was desert "unknown to the plow."
ACRES OF 1920 PIMA COTTON UNSOLD IN GINYARDS

Pictures below are reproduced from Sunset Magazine, July 1921, as part of article, "What Cotton Did to Arizona," by Walter V. Woehlke

LIQUIDATING THE 1920 CROP

The author, secretary-treasurer of Sunset in 1921, stated that the inscription on bale to right was made in 1920. The upper photograph shows part of immense 1920 crop (73,837 bales in Salt River Valley), which Woehlke said was than unsalable at low prices. Sarival was a Goodyear buying agency. The process of liquidating the 1920 crop, mostly by Arizona Pima Cotton Growers' Association took several years.

FOUR YEARS' PROFIT LOST IN THREE MONTHS

Pima cotton in 1921 was called "roulette and faro" crop of the Southwest, "the plant that led Salt River Valley up the easy grade to the very top and then kicked it over the edge on the steep side." Tales of riches gained and lost are related by author Woehlke who also cited many growers lost four years' profit in three months.

The author wrote that in one season the Salt River Valley's cotton deficit equalled the entire construction cost of Roosevelt Dam, including the elaborate canal and ditch system. The full force of the disaster was further measured in the cost of replanting 50,000 acres to alfalfa and replacing 30,000 dairy cows sold during the 1917-1920 extra-long staple cotton boom.
CHAPTER VIII.

1917-1920—"BOOM AND BUST" YEARS FOR PIMA INDUSTRY

The manager of the cotton and fabric division of the Goodyear Tire & Rubber Company wrote in a 1920 edition of The Textile World Journal:

From a textile man's point of view, there must be something very amusing in the general acceptance to the terms "rubber tire" and "rubber belting" and "rubber hose." A very large part of the material in these "rubber" articles is cotton. In fact, in some ways it might be considered that the articles were made from cotton with a protective coating of rubber. . . . If we estimate five and a quarter pounds of cotton on the average in each tire, it would require something like 400,000 bales net for this year. Inasmuch as tire fabric has to be of extra-long staple . . .1

Harvey S. Firestone, founder of the Firestone Rubber Company, in 1917 cited as the rubber industry's weak point: "Its dependence on foreign sources for its raw material."

Britain placed a virtual embargo on Egyptian cotton during World War I. American tire makers desperately needed Egypt's extra-long staple and called this hindrance a "rankling situation."2

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2Rubber Age, April 10, 1917.

In the first two war years (crop years ended July 31) of 1914-15 and 1915-16, over 600,000 bales of Egyptian cotton came into the United States, imports averaging 301,585 bales each year. In the next three years, 1916-17-18, Egyptian imports averaged 138,130 bales annually.  

When the extra-long staple was most needed, Egyptian imports fell off for two reasons: (1) Britain controlled production along the Nile and had priority for her own war needs, and (2) after Germany declared unrestricted submarine warfare in February 1916, Allied ship losses were so high that space was available only for munitions and war supplies. This closed the Egyptian cotton market to ordinary industrial uses in America.

Domestic mills were already consuming the available supply of Sea Island cotton. In the first thirteen years of this century, 1900-1912, Sea Island crops averaged 90,690 bales. The 1911 harvest of 119,293 bales was the record high of its history. The next crop of volume was in 1916 when demand and top prices rung up the second highest year of its all-time production, 117,559 bales. Government experts

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4U. S. Tariff Commission, Report 85 (Washington: 1935), Section V. table 1, p. 109. Egyptian cotton imports in World War I years, the crop year ending July 31: 1914-15, 252,373 bales; 1915-16, 350,796; 1916-17, 199,892, 1917-18, 114,580; 1918-19, 100,006. The 1915-16 import was second only to the 1919-20 importation of 485,004 bales, a flood of extra-long staple so intense that Pima cotton was inundated to ruinous price levels.
predicted, however, that Sea Island was on the way out, due to boll weevil infestation and deterioration in fiber. In 1919, the crop was only 6,916 bales, and in subsequent years became almost non-existent.\(^5\)

Peru, the only country other than Egypt growing extra-long staple cotton during World War I, increased its exports to the United States in these years. The volume received from Peru compared to Egyptian imports, however, was insignificant. Whereas over 600,000 bales came in from the Nile, Peru shipped American mills only 21,262 bales of cotton in 1914-15 and 1915-16, an average of 10,631 bales a year. By 1919-20, the Peruvian imports received in the United States reached 63,426 bales, a record high which, added to the already heavy importation of 485,000 bales from Egypt, combined to ruin the domestic price by harvest time of the 1920 crop. Other wartime years Peruvian imports were well over normal receipts but could only be helpful in the crisis.\(^6\)

Tire Companies Seek New Cotton Source

American-Egyptian cotton was just in its birth-pangs when the textile industry, most particularly the tire makers,


called for all-out expansion to meet the emergency. The 1915
crop was only 1,095 bales and the 1916 harvest was but 3,331
bales. This, to an industry with bulging war-time orders,
was a mere bagatelle, but it had potentialities for which
tire men came to the Salt River valley in hopes of developing. 7

Paul W. Litchfield, Goodyear factory manager, came out to
Arizona in the summer of 1916, offered ranchers "a handsome
guaranteed price" to grow more cotton, but failed to get favor­
able response. So, driven by circumstances, the company bought
24,000 acres of desert land, and by super-human effort planted
acres sufficient to reap a harvest of 1,500 bales of its own
in the 1917 crop. 8 Other companies, Firestone, Fisk, and
Dunlop, came into the market, setting off a boom in extra­
long staple cotton growing.

By 1917 the tire companies were in a mood not only to
finance growers with loans but to buy all available cotton
at guaranteed prices. As a result, a considerable portion
of the 1917 crop was sold under contract prior to harvest.
Some contracts were executed in the early spring prior to
planting and others as the season progressed, calling for

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7Hugh Allen, The House of Goodyear, (Cleveland: 1949),
p. 50. The extent to which war influenced business volume is
shown in the increase in Goodyear sales from $36,490,651 in
1914-15 to $168,914,982 by 1918-19. Tire production of 1915
was 2,500,000; by 1917, 6,000,000. (p. 107).

8Ibid., p. 153. The crop relieved the shortage at
Akron, the author wrote, and came in time to get in on the
rising prices.
delivery at picking time at prices ranging from thirty to fifty cents a pound. Unsold cotton at picking time opened at about fifty-three cents, rose rapidly to fifty-eight cents, then to seventy-five cents. By December 1st, a few Pima bales were sold at eighty cents a pound.⁹

Although the bulk of the 1917 crop was grown in the Salt River Valley (29,000 acres of 35,400 in Pima cotton), 4,200 acres of extra-long staple cotton were planted in the Yuma reclamation project (Arizona and California) and 200 acres in the Imperial Valley of California.

Of the total 1917 crop of 15,966 bales, 13,000 was of the Yuma variety and 2,966 bales of the new Pima. The new variety, developed by Kearney from a single plant found at Sacaton in 1910, was characterized by a finer, lighter-colored, and longer fiber, having an average staple of 1-11/16 inches, and sold at two to six cents a pound above the Yuma.¹⁰ Because of its distinctive qualities, the

⁹J. H. Collins, A Study of the Marketing Conditions in the Salt River Valley, Arizona (UA College of Agriculture Experiment Station, Bulletin 85, March 1, 1918), p. 31. Goodyear and Firestone financed new growers with loans, guaranteeing specified prices on delivery. The other companies sent in buyers, bidding up prices to get a share of the crop.

¹⁰The first commercial crop of the new Pima, grown in 1916, was 253 bales. E. A. Shaw & Co., Boston cotton brokers, bought 179 bales of this crop and distributed the new variety among mills on the eastern seaboard for testing. Shaw opened a branch at Tempe in 1916. Prices paid for Pima were as high as fifty-eight cents a pound at ginyard while Yuma was bringing twenty-seven cents to fifty cents a pound. E. A. Shaw & Co., Inc., American-Egyptian Cottons (Boston: 1950), p. 6.
Bureau of Markets of the United States Department of Agriculture sent in cotton experts to establish new grades. By December 1, 1917, these experts, working at gins in the Salt River Valley, had inspected 1,000 bales of the new Pima crop.

New Gins, Buying Stations in 1917

The Southwest Cotton Company, incorporated as a subsidiary of the Goodyear Tire and Rubber Company to handle their newly-launched cotton venture, erected eight cotton-ginning plants in Maricopa County in 1917. These were located on their plantations and at Glendale, Phoenix, Tolleson, Tempe, Mesa, and Chandler. A cotton-buying department, named Sarival, after the first letters in Salt River Valley, was also opened at Phoenix in 1917. In 1920 this was transferred to the company ranch at Litchfield Park to assist growers in cultural methods to produce more and better cotton, and to cooperate with the United States Department of Agriculture and the University of Arizona in the production of pure planting seed. B. B. McCall, a Florida ginner, and E. G. Attaway, a former Oklahoma-Texas cotton grower, built a modern roller-type gin at Mesa in 1917, having a capacity of sixty bales a day. Business was conducted under the firm name of Arizona Cotton Ginning and Manufacturing

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11 Supra, Chap. V, p. 8. Dwight B. Heard, prominent Arizona Pima cotton grower, wrote in the Textile World Journal (Nov. 22, 1919, p. 175); "An average gin stand under good conditions turns out about one bale every ten hours."
Company. This mill replaced the first large gin built in the valley by the Mesa Exchange which had burned to the ground at the start of the 1917 season due to an explosion in its boiler room. The McCall-Attaway Company also built a ten-stand gin at Tempe. Later these plants were sold to the Firestone Rubber Company. In 1923, after the rubber companies no longer had extensive use for the domestic extra-long staple cotton, ownership was acquired by the Mutual Cotton and Oil Company.  

Herbert B. Atha, pioneer of the Pima industry in the Phoenix area, incorporated under the name Arizona Egyptian Cotton Company, also expanded activities in 1917. To supply his Phoenix plant, he opened buying stations, with scales and warehouses, at Laveen, Mesa, Gilbert, Chandler, Glendale, Peoria, Cashion, and Buckeye. The central gin had direct rail connections with all these stations, except Laveen. The 1917 lint output of the Atha mill was destined for American Thread Company's mills at Williamantic, Connecticut, and Holyoke, Massachusetts, for the manufacture of "Star" brand thread. Atha had an order for 8,000 bales from the thread company. He further anticipated an output of 3,200 tons of an oil cake under the trade name of "Kapco," and the manufacture of lard substitutes and soap. The oil was sent

to Los Angeles, California, where the manufacturing process was completed.  

Atha boasted of the harvest of the 1917 crop in words of optimism, tinged with a flavor of the boom to come in the next few years:

Arizona Egyptian cotton is making good beyond all expectation. The yield is above the average, and the quality above the standard commonly used to determine values by cotton buyers . . . indicate in positive terms that prosperity is with us. With twelve per cent of the cotton picked and the big spring-toothed gins running full time; with pickers pouring in from everywhere to get some easy money . . . the streets of Phoenix are beginning to look like the "days of old, the days of gold."  

The cotton exchange at Tempe, established by growers in 1914, was the prime commercial center for Salt River Valley extra-long staple cotton transactions, aside from those completed directly which became the predominate manner of sale in 1917. The United States Department of Agriculture located its grading and classifying office at Tempe, first to establish grades for the Yuma variety and in 1917 to provide the sales basis for the new Pima cotton. The exchange had an eight-stand gin, but maintenance of a pure seed supply was one of its most important functions. The task of converting the plantings from the Yuma to the new Pima variety without cross-breeding or contamination

13 McClintock, op. cit., p. 7.

was a major accomplishment of the Tempe Cotton Exchange at a time when acreage was rapidly expanding.

The new Pima cotton was more productive, had larger bolls, a longer fiber, and better lint quality than its parent Yuma. Kearney, working at the Sacaton farm, had developed sufficient seed to plant a few hundred acres by 1916. By 1918, working through the Tempe Exchange, practically the entire Salt River Valley acreage was planted to the new Pima variety. 

The 16,000 bales of American-Egyptian cotton grown in 1917, both fiber and seed, sold at unprecedentedly high prices. This was the year extra-long staple cotton ceased to be a sideline and became one of the leading industries of the Salt River Valley (13,358 bales). The per bale return for the entire crop averaged in excess of $343. This represented soaring profits, stimulating new acreage in Arizona and California. The 7,300 acres devoted to extra-long staple in 1916, exclusively in the Salt River Valley, exploded

15 Collins, op. cit., In 1917 the Tempe Exchange, cooperating with the federal department of agriculture, released seed to farmers south of Tempe who planted 6,700 acres. Every grower executed a contract designed to continue control of the seed by the Exchange. The agreement provided that the Exchange must approve the land and be given the right to enter upon it at any time to see that it had been properly prepared and seeded and during the growing season, working with the USDA, fields could be rogued and plants and parts of crop destroyed, at the growers expense, if need be. The Exchange retained unconditional ownership of the seed, the grower receiving only oil-mill prices in payment. This unusual contract placed absolute control of the new Pima in the hands of Exchange and proved an effective instrument in preserving the improved qualities of the new variety. The complete contract appears in this work.
to 243,000 in the two states by 1920: 200,000 in Arizona (180,000 in the Salt River Valley) and 43,000 in California.

In the first five years of commercial production (1912-16), crops totaled 13,123 bales valued at $1,717,560. In the next four years, 1917-20, 185,151 bales of Pima cotton valued at over $50,000,000 was produced. The United States Department of Agriculture gives this record of the "boom" years, including 1916 since its bale yield was $115 over the 1915 average bale return:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ACREAGE</th>
<th>BALES</th>
<th>CASH VALUE</th>
<th>BALE RETURN</th>
</tr>
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<td>1916</td>
<td>7,300</td>
<td>3,331</td>
<td>785,900</td>
<td>$233</td>
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<tr>
<td>1917</td>
<td>35,400</td>
<td>15,966</td>
<td>6,102,000</td>
<td>343</td>
</tr>
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<td>1918</td>
<td>78,600</td>
<td>36,187</td>
<td>11,093,000</td>
<td>270</td>
</tr>
<tr>
<td>1919</td>
<td>88,500</td>
<td>40,437</td>
<td>18,440,000</td>
<td>406</td>
</tr>
<tr>
<td>1920</td>
<td>243,000</td>
<td>92,561</td>
<td>14,475,000</td>
<td>143.16</td>
</tr>
</tbody>
</table>

1919: Year of Optimum Prices

In 1918, the planting of American-Egyptian cotton spread into still newer areas. Of the 78,600 acres planted, 72,000 were in Arizona and 6,600 in California. In addition to the 69,000 acres in the Salt River Valley, Pima cotton was planted in the Imperial and San Joaquin Valleys of California, in several localities around Yuma, at Parker on the Mohave Indian reservation, at Casa Grande and Florence, and in the Santa Cruz Valley near Tucson. The United States Department of Agriculture warned that this widespread expansion had strained the Pima seed supply and cautioned against

16USDA Yearbook, 1926, p. 252. The bale return is figured on the value of both the lint and the cottonseed.
misrepresentations in seed sales.17

The returns from cotton sent land values and rentals in the Salt River valley to new high levels. Land formerly renting for ten dollars an acre went up to thirty dollars and was considered a good investment at the higher price. The use of wells beyond the Salt River Project increased as rough lands were levelled for deep-well irrigation. The sole problem was to grow as much American-Egyptian cotton as possible; not enough was being grown to supply the demand. With tire and thread companies bidding for supplies, the War Department appeared as a probable heavy consumer by buying 200 bales of Pima to test for use in aeroplane wings, paying seventy-three cents on the Tempe market in early 1918.18

The 1919 extra-long staple crop was almost entirely grown in Arizona. California had only 1,500 acres of the 88,500 acres planted to Pima. Of the approximate 40,000 bales produced, 37,986 bales were grown in the Salt River Valley. Californians grew only 675 bales. This is the

17USDA 1918 Yearbook, p. 687. Egyptian cotton acreage for 1917 is given at 36,000 (33,000 in Arizona, 3,000 in California), and 1918 acreage at 80,000 (75,000 in Arizona, 5,000 in California).

18Leopold A. Chambliss, "Growing Cotton in the West," World's Work, March 20, 1920, p. 508. The author states a British R-34 plane required fabric that would clothe 10,000 persons. The war had brought a shortage of over eleven million bales of cotton. The reclamation projects of the Southwest were expected to meet the emergency.
year prices hit a fantastic figure. Sarival, the Goodyear subsidiary, paid as much as $1.25 per pound or $625 a bale. The average bale return for the entire crop was $406.

The 1920 "Long-Staple Cotton Craze"

Stirred by the boom prices of the 1919 crop, the "long-staple cotton craze" struck with full impact in 1920. The 1919 plantings of 88,500 acres were almost tripled to 243,000 acres, an all-time high acreage planting. The Arizona acreage was 200,000, California 43,000. Three-fourths of the irrigated land in the Salt River valley (180,000 acres) were planted to Pima cotton in 1920. This was almost 100,000 acres more than the 83,000 acres sown in 1919.

Yuma County, which had favored Durango cotton in the early experiments, joined the Pima parade, increasing its cotton acreage from 11,000 in 1917 to 27,000 in 1920.

The Pinal county agent reported that 8,000-9,000 acres would be planted to cotton there in 1920 whereas only 2,500 acres had been in the crop the year before.

Pima County had only 150 acres in cotton in 1918

19Walter V. Woehlke, "What Cotton Did to Arizona," Sunset Magazine, July 1921, shows picture of bale so labelled, as reproduced on page 143.
and 1,100 in 1919. This was extended to 4,000 in 1920.20

The Santa Cruz valley, located between Tucson and Nogales, was not much in the cotton news of earlier days, but in the spring of 1920 a national farm magazine pictured this area as a part "in an epic movement that has had all south central Arizona with excitement for many months." From the account given, one company claimed that in two months 250 men had bought cotton land in its irrigation project and "Tucson storekeepers say twice that many have settled in the valley since the last load of cotton went into the gin last month." The author used colorful language in depicting these events:

... the rush into the Santa Cruz valley for cotton lands--fat alluvial bottoms which will produce the prized long-staple cotton that has made gold mines in the Salt River valley up around the Roosevelt dam. Like a gold rush on Nome's beach or Leadville's great silver rush, the lure of long-staple cotton has operated in the Santa Cruz. ... Egyptian cotton ... at the dizzy price of ninety-seven and a half cents a pound ... the pioneers cleaned upward of $250 to the acre. Immediately word ... flew all through the west; prune ranchers in the Idaho irrigation district heard it; solid hog and hay farmers away off in Nebraska and Iowa caught the magic whisper, sold out and took the first train to Tucson. The rush was on.

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20R. N. Davis, History of Dairying in Arizona (UA Agricultural Experiment Station: June 1958), pp 6-9. The author's figures for county acreage are used above. Outside Salt River valley, both Pima and short staple cotton acreage increased. The 1919 Arizona cotton crop approximated 60,000 bales (40,000 Pima; 20,000 upland). The 1920 crop of all cottons was 103,000 bales: 82,041 Pima; 20,959 upland, valued at $22,053,101, lint and cottonseed.
They came--they are still coming--from the cotton lands of Oklahoma; from the Imperial valley . . . cotton growers of the Salt River valley saw the chance to sell their lands at top figures and come down to the Santa Cruz to pick up new prospects at one-third that figure. Men who never saw cotton grow in their lives . . . brought their bankroll, their younsters and their household goods down to find the foot of the rainbow.21

The Santa Cruz valley did not become an important cotton-growing area although the potential existed. A development corporation, called Tucson Farms Company, had small success with its initial promotion and was taken over in 1918 by a new manager, F. W. Taylor. With the assistance of University of Arizona experts, 150 acres were planted to Pima cotton and a forty-bale crop realized. The company expanded in 1919, built a gin, and planted 1,100 acres, which provided, in the author's words, "tremendous profits" for the company and others in the valley.22 Land prices were low compared to those of the Salt River valley, causing some owners there to sell at supposedly big profits and join the rush to Santa Cruz valley.

Cotton Forces Decline in Dairying

For many years prior to 1919, alfalfa was the most important crop in the Salt River valley, ranging from one-half

22Ibid., p. 22.
to a third of the total cropped acreage. The year 1920 saw the low-point of production with only one-eighth of the land under cultivation in alfalfa. The plight of the dairy and alfalfa farmer, faced with high-priced land for rental, inflated wartime feed prices, and high labor costs, was given editorial sympathy in March 1919:

The Salt River valley farmer has his problems. One of them is how to make a choice of crops where there are so many alluring opportunities. . . . The alfalfa and dairy interests in the past have been the financial salvation of this section . . . and have had a sorry time of it for a couple of years. All have sweat blood and some have lost money. . . . the milk producer and the land owner have yielded to the siren song of cotton and much good dairy stock has gone to the block. . . . We know men who were broke five years ago that now are actually rich, and they owe it all to cotton. . . .

During 1920 the University of Arizona agricultural extension service found it difficult to interest Maricopa county farmers in dairying. To advocate anything but Pima cotton was like "a voice crying in the wilderness." B. G. Webster, manager of the Maricopa creamery, estimated that the number of dairy cows of producing age in Maricopa county dropped from 65,000 in 1917 to 6,000 in 1920. The situation was pictured this way:

Everyone was excited about cotton; some of the merchants purchased farms and became absentee Pima

cotton growers. The local banks encouraged the farmers to grow cotton and readily financed the efficient cotton growers. Irrigated land doubled and tripled in price, and became too expensive for dairying. A combination of high priced land, low cream prices, and excitement over cotton resulted in a rapid reduction in the number of dairy cows in the valley.24

Business Optimism of 1920

Overlooking what was happening to the dairy and alfalfa area of farming in Maricopa county, high optimism prevailed in 1920 in business circles over the prosperity and future prospects Pima cotton brought to the Salt River valley, center of the industry.

The Phoenix Chamber of Commerce advertised: "Surrounding Phoenix on every side are farming lands, the richest in America. Here long staple cotton, sells for $1.25 a pound, is grown and reaches its highest state of perfection."

The Mesa Commercial Club's advertisement was in a similar vein: "Mesa, Arizona: In the heart of the Salt River valley where Pima cotton, the best long-staple in the world, is grown and selling for $1.25 a pound . . . ."

The Florence Chamber of Commerce expressed it this way: "Cotton is king--Pima long-staple--the highest priced cotton in the world--forty acres will make you independent."

The Phoenix Chamber engaged in the hazardous pastime

of counting the profits of the 1920 crop before the harvest, and missed the mark by some $30,000,000:

Maricopa county, of which Phoenix is the county seat, is putting in 185,000 acres of this cotton now. This will mean by the close of 1920 $46,250,000 or $5,781,250 a month, $192,768 a day, or $8,032 an hour coming into Phoenix and its valley.25

Even the Bureau of Plant Industry, in its annual report for 1920, broke from its traditional conservatism by prophesying that the 1920 crop, approximating 250,000 acres in Arizona and California, had "a prospective value of from $50,000,000 to $100,000,000." The estimate was based on 1919 prices. The bureau cited the confidence in the future of the extra-long staple cotton industry as manifested in the decision of the Goodyear Tire and Rubber Company to erect a cotton mill connected with a large tire manufacturing plant in Los Angeles. This was the first industrial plant of its kind to be built in western United States. The cost of about $20,000,000 represented an amount of capital which the company had already invested "in the production of Pima cotton."26

25As cited in Arizona State Magazine, May 1920, p. 4. Figures were based on $1 a pound price and a half bale to the acre yield although the chamber stated, "this cotton now commands $1.25 a pound and many producers raise a bale and more to the acre." The advertisements referred to above were printed in the same edition: Mesa, p. 11; Florence, p. 20; Phoenix, p. 24.

26USDA Annual Reports, 1920, pp 162-163. Allen, op. cit., pp 351-52. Goodyear operated its Los Angeles cotton mill until 1938 when it was dismantled and parts sent to Brazil.
1920: Year of Cotton Disaster

The 1920 season did, indeed, appear auspicious for the Pima cotton grower. In the spring manufacturers offered a minimum price of sixty cents a pound and some contracts had been made at eighty cents.\textsuperscript{27}

However, the phenomenal expansion which reached the apex of the pyramid in 1920 had many weak spots which became apparent with the harvest of the 1920 crop.

For example, the acreage increase in the Salt River Valley from 83,000 acres in 1919 to 180,000 acres in 1920 enveloped much land not adaptable to cotton because of soil conditions and grass and weed infestations. Desert land irrigation was and is an expensive process. Labor costs were high. Large sums of borrowed money were involved, from banks and federal farm loans, and machinery bought on time, adding to overhead costs.

The county agricultural agent estimated that the cost to produce Pima cotton in Maricopa county in 1920 was about sixty-five cents a pound.\textsuperscript{28}

\textsuperscript{27} F. Cook, One- Variety Cotton Communities, (USDA Bureau of Plant Industry, Bulletin IIII, November 25, 1922), p. 38.

\textsuperscript{28} Davis, op. cit., p. 7. The Phoenix Chamber of Commerce estimated the cost to produce an acre of Pima cotton at eighty-three dollars an acre, (fn. 25), presumably based on 1919 costs. The yield averaged 229 pounds of lint to the acre that year, placing their estimated cost just above thirty-six cents a pound.
The year 1920, contrary to the spring outlook, proved to be a year of disaster for the Pima cotton industry. Cotton was indicted because of the 1920 collapse as responsible for the only serious setback agriculture has suffered since agriculture began to amount to something in Arizona.\textsuperscript{29} Not only were many growers wiped out, but the financial structure of the area was weakened and business generally depressed. The tire companies, with large Arizona investments to get Pima cotton, also suffered severe losses, were forced into refinancing programs, and passed dividends.

The fundamental cause of the disaster was, of course, the sudden price decline due to international events. The war was over. Defense orders for military supplies were canceled. The Egyptian supply which had been under restraint during the war now was unleashed on the American market in the greatest import torrent in history. A total of 485,000 bales of the Egyptian stock flooded the American market. A post-war depression limited purchaser buying power, and high quality cotton felt a shrinking market.

Pima cotton sold as high as $1.35 in 1919 and growers expected $1.50 cotton by 1920. Instead, the record-breaking

crop of 92,561 bales became a "white-elephant" commodity, requiring several years to liquidate.

Professor R. N. Davis of the University of Arizona College of Agriculture, in writing a history of the dairy industry upon his retirement in 1958, stated that the price of the 1920 Pima cotton crop "instead of being $1.50 per pound was twenty-eight cents, and demand was limited at this price." The situation was crucial to farmers but went deeper in his assessment:

Harvest time, 1920, found the farmers in a serious economic condition. They could not meet their obligations at the banks and the farm machinery dealers nor pay on their federal loan.

In addition to the cotton growers and merchants, the farmers who sold their farms on payments were also in trouble financially. A number of the farmers who had sold their farms at high prices for what they considered good cash payments had their farms returned to them in a few years later with delinquent mortgage payments, several years' taxes in arrears, the farms in a bad state of repair and alfalfa replaced by cotton stalks.

Figuratively speaking, business in the county was on its back. Banks and others who held mortgages did not dare foreclose because the security was not worth the mortgage. Some of the banks failed. A large number of farms were taken over by the more fortunate farmers by assuming the federal loan and taxes. Consolidation of farms brought about a material reduction in the rural population. According to the Encyclopedia Britannica, the actual farm population in the state decreased from 90,560 in 1920 to 71,954 in 1925. Maricopa, Pima, Pinal, and Yuma counties all had a reduction in rural population during that period.30

30Davis, op. cit., pp 7-8.
Decline of Pima Cotton Acreage

Cotton became anathema to the dairy, cattle, and alfalfa farmers after the crash of 1920, and by 1922, except for 100 acres in California, the Salt River valley again became the sole area of production. When Coolidge dam opened up new irrigated acres in 1929, some Pima cotton was planted in Pinal county and other counties as well. New Mexico and the El Paso region of Texas have since 1939 planted extra-long staple cotton.

As farmers in the Salt River valley took up the task of replanting 50,000 acres to alfalfa and replacing 30,000 dairy cows, Pima cotton acreage in the Salt River valley grew less: 73,600 in 1921; 77,000 in 1922. With limited alfalfa acreage, cattle reeders paid "dizzy prices" for hay. Alfalfa costs went up; cattle prices went down. Unless you enjoy strong language, one writer stated, don't ask the cattlemen of Arizona what they think of cotton.

Cotton, however, was in Arizona to stay. When upland prices were high in 1924, Salt River growers put in 122,000 acres and cut their Pima cotton plantings to only 8,000 acres. Not until 1942, however, did the cash income from cotton in Arizona exceed what Pima growers of the state

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31 Woehlke, op. cit., p. 62.
received from the 1919 harvest. That Pima survived as an important cash crop is evidenced in the fact that almost half (forty-eight per cent) of the 1942 total money income from all cottons in Arizona came from the Pima plantings.  

The year 1920 was long remembered for the great failure of the cotton market, "a disaster to the Salt River valley of which seventy-five per cent was in cotton, and the accompanying widespread financial depression." C. W. Steele, secretary of the Arizona Dairy Association, an admitted victim of the "cotton craze," swore: "Never again will cotton be planted to the exclusion of all other crops."  

Dan F. Collett, secretary of the Mesa Commercial Club, boasted at a cotton carnival held in Mesa in October 1920 that three gins in his city the previous year did an export business of approximately $5,000,000, all Pima cotton, asserting: "No other is grown nor will be allowed in this valley." Governor Thomas F. Campbell, speaking at the celebration, estimated that cotton "means a gross income to the farmers of this valley of something over

32Chap. V, p. 4, fn. 6. Because 1942 was a war year when Pima cotton growth expanded at the request of the War Mobilization Board, the comparison favors the extra-long staple variety.  
33Arizona Producer, December 15, 1925, p. 3.  
34Arizona Producer, March 1, 1924, p. 15.
$40,000,000," adding that Mesa was the center of at least half of the cotton acreage of the state. In September 1921, after the crash, Collett indulged in some post-mortems:

Nearly everybody concedes that farmers made a mistake when they forsook well-tried and successful diversified farming for the exclusive raising of cotton. All would have gone well if the demand and price had kept up to the standard of 1919 . . .

Another thing that added to the woe of the cotton raiser was the fact that many got the "get-rich-quick" idea into their heads. Not content with the acreage they had, they plunged into the buying of land, more than they could properly till and decidedly more than they could reasonably pay for. . . . Smaller farms and better farming will be the rule of the future.  

Generally, the expressions were aimed to bolster confidence in the Pima cotton industry and the Salt River Valley, such as made by Charles M. Morgan, spokesman for the American-Egyptian Cotton Growers' Association:

No thinking man interested in the future prosperity of the Salt River Valley should allow the unfortunate conditions of business in general and of the cotton market in particular for the past two months to shake his confidence in the cotton industry of Arizona, even for a moment. Every student of the industry realizes that we have here in Arizona, the finest cotton producing area in the world . . . the only district in the world growing only one kind of cotton--the finest grown . . .

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36Arizona State Magazine, September 1921, p. 6.
37Arizona State Magazine, February 1921, p. 6.
A writer for Sunset Magazine, in summarizing the aftermath, took the optimistic view that, unlike the South, cotton was not a matter of life and death to Arizonans: "Ten years ago they grew no cotton at all and did well. They do not need cotton now. The spree is over. The paper profits have vanished, but the deep soil, the brilliant sun and the water are still there." 38

Although four years' profits vanished in three months, he found that the Copper State was still smiling, secure in the knowledge that the worst was over, that bedrock had been reached and dented, that there was but one way to go and that was--up. Conditions could only improve.

History proved this assessment to be sound.

38Woehlke, op. cit., p. 62.
Goodyear Tire and Rubber Company of Akron, Ohio, Invested $20 Million in Arizona Pima Cotton Industry -- 1916-1920

PAUL W. LITCHFIELD (1875-1959) KENNETH E. MC MICKEN (1882-1959)

These men (cousins, their mothers were sisters) personified the Goodyear program in Arizona. Boston-born Litchfield, longtime company president, came to the Southwest in 1916 to buy cotton, stayed to grow it and built a show-place home on the desert. McMicken, Brooklynite son of a Wall Street broker, joined the Southwest Cotton Company in 1918, lived to become a cotton authority and "patriarch of Arizona agriculture."
CHAPTER IX.

GOODYEAR ARIZONA COTTON VENTURE

The Goodyear Tire & Rubber Company of Akron, Ohio, according to an estimate of a bureau in the United States Department of Agriculture, invested $20,000,000 in developing the Pima cotton industry in Arizona.¹ The Southwest Cotton Company (changed to Goodyear Farms, Inc., in 1943) was set up as a Goodyear subsidiary to carry on the cotton-producing enterprise.²

¹USDA Annual Report, 1920, pp 162-163
²Goodyear Tire & Rubber Company, The Story of Goodyear Farms, (Akron, Ohio: November 1953), pp 7-20. The Southwest Cotton Company was originally capitalized at $1,000,000, then was increased to $5,000,000 and later to $15,000,000. Besides growing cotton, the Southwest Company was the purchasing agent for Goodyear needs. In the nine years Goodyear was in the market, the company bought 79,405 bales of Pima cotton which represented 28.5 per cent of the total Salt River valley crop. It loaned money to growers to produce the crop, at one time advancing as much as $1,475,000. To process the cotton, eighteen roller gin plants were built in the producing area. It ultimately came into possession of 38,000 acres of Arizona desert land, which it reduced to 16,000 acres in 1943. Mules were used to clear the land at the start, with 1,200 in use during 1917-19; ten years later mules numbered 200 with 36 tractors doing most of the plowing and cultivating. The company built 158 miles of new roads, 118 miles of electric transmission lines, 42 miles of telephone lines, 80 miles of concrete and unlined ditches, and now has 70 wells from which water is pumped at the rate of 1,928 gallons a minute.
The year 1920 started out more auspiciously for Good-year than any in its history. The Arizona cotton venture was making $1,000,000 profit annually. Earnings on common stock, including stock dividends, had averaged better than fifty per cent for the twelve years prior to 1920. The company was looking forward to immense profits in 1920 because the year was started with orders on the books which indicated a sales volume of a million dollars for every working day of the year ($300,000,000), a pace set in March 1920 when sales were $20,000,000.

At the start of 1920, Goodyear paid its biggest dividend in history ($6,971,584). By the end of the year the company was on the verge of bankruptcy.\(^3\) By November 1920 sales were down to $4,500,000 (1919 sales were $168,000,000).\(^4\)

Arizona Pima cotton, which had admittedly contributed to Goodyear's record profits, became a major problem in the time of crisis. At the start of 1920, cotton was considered such a money-maker by the company that it added 11,000 acres additional Arizona desert land (the Marinette ranch) and had plans to extend plantings into Mexico. During

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\(^3\) Allen, op. cit., pp 50-51.

the year, however, between planting and harvesting time, raw cotton crashed from one dollar a pound and more to twenty cents a pound. The company had commitments to buy Pima cotton, no longer needed, for sixty cents a pound.5

'1920 Refinancing Program

In November 1920, Goodyear executed a revolving loan of $25,000,000 with Goldman Sachs, a New York banking firm, pledging materials and stock as security, and permitted trustees to take charge. The company mortgaged its Arizona holdings for $1,000,000. Before the year was out, however, it was apparent that new financing was needed.

Dillon, Read & Company, then new in the investment field, sponsored a reorganization, effective only if creditors would agree on a program to liquidate bills and to provide ample working capital.

By May 21, 1921, the reorganization had become effective. Three trustees, with authority to name a majority of the board of directors assumed the management of the

5Ibid., p. 195. Litchfield wrote that Goodyear could pay Arizona growers only forty dollars in cash on each $100 of its cotton commitments, giving sixty dollar certificates payable at $86.20 at a later date.
company, and retained control until 1927.\(^6\)

Goodyear escaped bankruptcy, but at a high price in the opinion of stockholders who instituted a law suit which mitigated some of the terms but left the basic settlement unchanged. Since the company received only 90 cents on the dollar and had to pay it back at $1.20 or $1.10 on the dollar and pay eight per cent interest, Litchfield wrote: "Boiled down, we were in effect borrowing $87,000,000 at fourteen per cent interest." In the seven months of negotiations, Litchfield acknowledged that in the strain "my hair turned from a chestnut brown to be almost white as it is today (1954)."\(^7\) Litchfield was elected Goodyear president in 1926.

The Arizona Goodyear plantation survived the 1921 reorganization although it was showing losses up to $100,000 a year and more. The new directors taking over

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\(^6\) Litchfield, op. cit., pp 195-197. In the reorganization, Frank A. and Charles Seiberling, company founders, and W. E. Palmer, treasurer, resigned, and Edward G. Wilmer, Milwaukee lawyer and financier, became president of the company. Control of the company was vested in Clarence Dillon, representing bondholders; Owen D. Young of General Electric, merchandise creditors, and John Sherwin, Cleveland banker, the holders of debentures. Each trustee received $10,000 in management stock. Securities issued were $27,500,000 in debenture bonds, $30,000,000 in prior preference stock, and $30,000,000 in bonds, issued at 90, callable at 110, and to pay eight per cent and be taken by Dillon, Read providing other issues were subscribed.

\(^7\) Ibid.
control in 1921 proposed its sale as a losing proposition. Litchfield, who had negotiated Goodyear's coming to Arizona, fought the liquidation and the Southwest Cotton Company remained active to go on to bigger things in Arizona.

**Effect of 1920 Cotton Crisis on Firestone**

The Goodyear Company reported a loss of $4,549,073 for 1921 and for the first time since 1904, no dividends were declared. No dividends were paid in 1922, either. 8

The Firestone Company had also invested heavily in cotton facilities in Arizona, but not in land to grow cotton as did the Goodyear Company. Firestone had money problems in 1920, also, but escaped refinancing as Harvey S. Firestone, the company president, informed Harry Chandler, Arizona cotton grower, in a letter written December 27, 1924: "It was only the confidence of a few of my friends in the banking business that saved the company from refinancing such as was done by other large companies. . . ." 9

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8 *Ibid.*, appendix three, p. 336. The only loss year other than 1921 since 1903 was 1932, when $850,394 loss was reported.

9 *Alfred Lief, The Firestone Story* (New York: McGraw-Hills, 1951), p. 51. General Motors, also hit in the 1920-21 depression, was taken over by the Duponts, W. C. Durant resigning as president. Litchfield (op. cit., p. 194) wrote: "We had no such friends to help us out . . . no one banking house who felt us as its responsibility. Seiberling, like Henry Ford and many other midwest industrialists, distrusted Wall Street."
Firestone, however, was forced to pass dividends in two years, 1922 and 1923, the only years missed since the 1905 start. Profits in 1920 were $9,396,912; in 1921, $949,354. The dividends paid on common stock in 1920 amounted to $3,607,685; in 1921, $543,860. Then followed two non-dividend years.\(^\text{10}\)

Vanishing earnings in the Firestone company were rooted in cotton, in part. The company president had gone to the British Isles to spend the summer of 1920 but hurried back in mid-year to lend his hand in stifling the serious set-backs his company was experiencing. This is the gist of the cabled information he received while in England:

The whole picture of the national economy was undergoing an alarming change . . . Farm prices cracked . . . The country was in a depression . . . Notes to pay off rubber and cotton purchases were falling due . . . Material kept arriving on contracts that had been signed for record amounts . . . Inventories were already excessively large . . . Cotton and rubber prices had crashed . . . Inventories and commitments were worth fifty cents on the dollar . . . The incoming raw material, unwanted and high priced, must be checked.\(^\text{11}\)

Firestone's experience with the British embargo on Egyptian cotton imports made him an advocate of the cultivation of this type of crop in the United States to mend

\(^{10}\) Lief, op. cit., p. 416.

\(^{11}\) Ibid., p. 128
what he called the rubber industry's weakest point: its
dependence on foreign sources for raw material. This was
the basic reason prompting the United States Department of
Agriculture to send scientists to the Southwest in 1902,
to breed an Egyptian-type cotton.

In 1923, the Firestone company liquidated its Arizona
cotton-gin holdings, receiving $360,000 in the transaction.
Goodyear did the same (receiving $320,000) except that
facilities on its Litchfield Park plantation were retained.

That Goodyear did not leave Arizona after the purpose
of coming to the state had been accomplished proved a boon
to the state's economy. Both agriculture and industry
profited.12 That the company stayed on even while losing
money and was no longer in need of extra-long staple cot-
ton was notable in itself. Even more colorful was the
company's coming in the first place, intending only to buy

12 Arizona' part in Goodyear's business life developed to
a peak in World War II when a huge aircraft plant, em-
ploying 7,500 persons, was built near Litchfield Park.
An aluminum plant was erected nearby and a company air-
research project in Phoenix employed an additional 1,000.
Luke Field, set up to train single-seater fighters, was
located near Litchfield Park and Goodyear turned over its
swank resort hotel, Wigwam, to house personnel in train-
ing there. The resort, one of Arizona's first "dude"
ranches, had eighteen wickups of three to six beds each.
Built in 1930, Wigwam was complete with golf course,
swimming pool, and riding facilities. A Goodyear Wing-
foot plant, equipped to mass produce cement igloo homes
over an inflated balloon, was opened at Litchfield Park,
serving to relieve the war-time housing shortage in the
region.
cotton and then being forced into growing it. This story, unique in American business, merits a place in the history of Pima cotton.

**24,000-Acre Purchase in 1916**

Paul W. Litchfield, in 1916 a Goodyear vice president and factory manager, was the central figure in the company's cotton gamble. He came to Arizona in mid-summer 1916, tried to interest ranchers in raising cotton needed at Akron, and offered a handsome, guaranteed price for all they could grow, but had little success.

In September, however, Litchfield executed a contract with T. E. McDevitt of Yuma, under which the latter agreed to lease 10,000 acres from Doctor A. J. Chandler, owner of the famed San Marcos hotel at Chandler, clear the land, plant cotton, and sell it to Goodyear at a specified price. McDevitt took the contract to his lawyer, E. F. Parker of Pasadena, California, to get his opinion on its soundness. Parker, after thorough investigation, told McDevitt he was in danger of losing everything he had under the contract terms. McDevitt balked on going ahead, and in desperation Litchfield asked his board of directors to take over the proposal, advising them that a suit to enforce the contract would bankrupt McDevitt and no cotton would be grown. The board accepted Litchfield's advice and Goodyear Tire &
Rubber Company went into the business of growing extra-long staple on an extensive scale.\textsuperscript{13}

**Top Talent Employed to Grow Cotton**

Goodyear's decision to grow cotton to keep its Akron rubber plant operating at full capacity brought recruitment of "the best counsel available."\textsuperscript{14}

Joseph R. Lofthus of Phoenix, formerly of the Imperial valley and the preceding two years general manager of the Chandler (Arizona) Improvement Company, bought much of the land for the rubber company. Two undeveloped tracts of desert, 16,000 acres along the Agua Fria river and 8,000 acres near Chandler, were acquired.

The firm of Quinton, Code & Hill was engaged to do the engineering and serve as consultants on construction. Litchfield thought them most competent: "Code knew more than anyone in the Southwest about underground water levels, and Hill had built the Roosevelt dam ..."\textsuperscript{15}

\textsuperscript{13}Litchfield, \textit{op. cit.}, p. 160

\textsuperscript{14}Ibid., p. 161.

\textsuperscript{15}Ibid. Because land ownership in the Salt River project, irrigated by water from Roosevelt dam, was restricted to 160 acres for individual or company, all Goodyear land except 160 acres had to be irrigated from deep wells. The 1917 water level was high, requiring drilling from 150 to 300 feet; water rose close to the surface; maximum lift was about 100 feet. (Allen, \textit{op. cit.}, p. 153.)
Shattuck & Nimmo, contractors who had built Roosevelt dam, were hired to prepare the ground for the first cotton crop of 1917, after which they sold their equipment to the Southwest Cotton Company to permit the Goodyear subsidiary to do its own work. The headquarters of Shattuck & Nimmo was at Bakersfield, California, and their equipment included 1,100 head of stock, mostly mules. C. H. Waterhouse, president of the Tempe-Scottsdale cotton exchange and experienced planter, was a superintendent on the project. Associated in this work was John P. Conduit, who had previously handled 30,000 acres of cotton in Mexico for an English syndicate. 16

To direct the planting, Goodyear retained E. W. Hudson, superintendent of the Sacaton station during the development of American-Egyptian varieties there and the foremost authority on extra-long staple growing in the Salt River valley.

The man selected by Litchfield as general manager of the project was Edward F. Parker, the Pasadena lawyer who had advised a client he had a money-losing contract with Goodyear. Parker, as vice president of the Southwest Cotton Company, continued as manager for five years, primarily as an expert on finances. McDevitt, the client.

16 McClintock, op. cit., p. 6.
became president of the Phoenix Cotton Oil Company, a profitable enterprise using the by-products of the cotton grown in the Salt River valley. The company was later sold to the Goodyear interests, after which McDevitt served as president of the California Cotton Oil Company.

Parker, addressing the Phoenix Rotary club in July 1917, expounded on the monies spent and to be spent by the Southwest Cotton Company in the Phoenix vicinity in 1917: $1,500,000 in the first seven months at the rate of $7,000 per day, to be increased to $10,000 per day in September, and $15,000 a day in October. Activities in progress included construction of five gins in Salt River valley, enlargement of the company oil mill with a new executive office adjoining, and the building of two towns, then called Cotton City and Agua Fria. It was planned that each town would contain warehouses, machine shops, garages, store buildings, offices, and have the facilities of any normal town, such as pool halls, theater, church, school, hospital, and so on.¹⁷

Parker, in the spring of 1918, reported that in the first year of business the Southwest Cotton Company had

purchased "something in excess of $3,000,000 of growers' cotton."\textsuperscript{18} This would approximate one-half of the value of all cotton grown in the Salt River valley in 1917.

In the nine years Goodyear continued in the extra-long staple market, Southwest Cotton Company bought 79,405 bales of cotton, which represented 28.5 per cent of the total Salt River valley crop.\textsuperscript{19}

To absorb some of the cotton commitments made in the record 1920 crop for which it was paying growers more than the open-market price, Goodyear purchased a cotton mill at New Bedford, Massachusetts in 1924, and made its own fabric, as it had done in Los Angeles since 1920. The company paid Arizona growers $40 in cash on each $100 of its 1920 commitments, giving $60 certificates redeemable at $86.20 payable at a later date in final settlement.\textsuperscript{20}

\textit{Goodyear's McMicken Pima Cotton Booster}

The balloon type tire, using ordinary long-staple and "Peeler" cottons of the Mississippi delta, came into production in 1923. The extra-long staple continued to be

\textsuperscript{18}McClintock, \textit{op. cit.}, p. 6.

\textsuperscript{19}Goodyear, \textit{op. cit.}, p. 8.

\textsuperscript{20}\textit{Supra}, fn. 6.
used in heavy-duty truck and bus tires, wherever high tensile strength was needed.  

The Southwest Cotton Company (Goodyear Farms after 1943) continued to serve the Pima industry even after the company's need for the crop no longer existed. The vast acreage of the Litchfield Park ranch afforded essential isolation in developing new varieties and was used by scientists of Sacaton and the University of Arizona extension service.

Kenneth McMicken, cousin of Litchfield, was associated with extra-long staple cotton-growing since joining the Goodyear venture in 1918. In 1919, he went to Egypt to study production methods and in 1928 he spent six months in Peru, where extra-long staple cotton is grown in volume. When the purity of Pima seed was threatened in the Salt River valley after Pima's low acreage in 1924 and widespread upland plantings, McMicken planted 1,200 acres to Pima cotton on the Litchfield ranch in 1926 from seed the Tempe exchange had stored from the purest Pima seed of the

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21 Joe H. McClure, Market Outlets for Cotton, (USDA PMA research Report 25, September 1952), p. 69. Until 1923, extra-long staple cotton was used exclusively for tire fabric. Prior to 1937 cotton was the only fiber used in tires. In 1947, 850,000 bales of cotton went into tire production which then constituted the greatest volume for any single industrial use. Since 1937 rayon, and later nylon, has gained in use for tire cords.
1918-19 crop, thus permitting 44,000 acres to be grown from seed of this crop in 1927.  

McMicken's service to agriculture, particularly the cotton industry, won him wide recognition and acclaim. The maintenance of seed purity was a prime concern with him during his forty-one years of work at Litchfield Park. In 1933 he was elected president of the Arizona Pure Seed Association. Appointed in 1934 to the Arizona Commission of Agriculture and Horticulture, an agency charged with control of crop insect pests and plant diseases, he continued in this service until his death on April 5, 1959, the final sixteen years as the commission chairman. He served on state agricultural boards mobilizing Arizona's resources in World War II and the Korean conflict, and was one of a national committee called to Washington to represent the nation's cotton growers in arriving at a policy of action on boll weevil control.

Cotton-breeding and research activities centered at Sacaton for fifty years were transferred to a new cotton center built in 1956 near Phoenix on 275 acres of land purchased by the Arizona Cotton Planting Seed Distributors in 1954 for $168,864. The association retained ten acres for an office building for itself and the Arizona Cotton

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Growers' Association and gave the remainder to the University of Arizona. McMicken was the one and only president of the seed distributors association from its incorporation on June 28, 1949, until his death. The association was organized to "multiply and distribute pure cotton seed for planting purposes."^{23}

During his lifetime, McMicken received numerous honors for his work in behalf of agriculture. In 1938 the Future Farmers paid tribute to him for aiding its program. In 1952, Governor Howard Pyle presented him with a plaque as "The Man of the Year in Arizona Agriculture" on behalf of the Future Farmers at a luncheon sponsored by the Arizona and Maricopa county farm bureau federations. At the 1959 annual meeting of the seed distributors association, a large print of McMicken was presented to the head of the University of Arizona experiment stations and accepted for display in an appropriate place of honor on the campus. For his work as chairman of the Ague Fria soil conservation district which secured a flood control dam protecting 274 square miles damaged by floods in 1951, the project was named McMicken Dam in his honor.\textsuperscript{24}

\textsuperscript{23} Statement of organization, aims, and functions of Arizona Cotton Planting Seed Distributors prepared by Dr. Scott Hathorn, economist in Department of Agricultural Economics, University of Arizona, September 1949.

\textsuperscript{24} The flood control structure protects Luke Air Base, Goodyear aircraft plant, Avondale, Litchfield Park, and part of the Beardsley area.
As a conservationist, leader, farmer, and man of progress, McMicken stands alone as the "patriarch of Arizona agriculture." These were expressions of tribute on his death. Editor Ernest Douglas of The Arizona Farmer-Ranchman summed up the role of McMicken and Litchfield, the man who brought Goodyear to Arizona, in these words:

Yes, Paul Litchfield of blessed memory supplied the capital and perhaps the original vision; but Ken McMicken supplied the know-how and dogged perseverance that made Goodyear Farms the outstanding success it has been from the start—a success financially, artistically and scientifically.25

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25Arizona Farmer-Ranchman, April 25, 1959, p. 8. Goodyear's Litchfield (op. cit., pp 162-163, 324) recounted a profitable transaction in cotton land, involving himself and E. W. Hudson, made on his first visit to Arizona in 1916. As the two were travelling about trying to interest ranchers to grow cotton for Goodyear, Hudson pointed out a half section of land near Tempe, nine miles east of Phoenix. Hudson advised Litchfield the land was good, close enough to river to build a canal to irrigate it but rough and impossible to cultivate, adding: "I can't afford to put in graders and scrapers. I work for a government salary. But if you will take it over and clear it, I would like an option to buy half of it back from you later." When Goodyear went into the business of growing cotton, Litchfield said he sold his land (to whom, he did not say, but presumably to Hudson) and used the proceeds to build La Loma, the name of his show-place home built later on 160 acres of land near Litchfield Park, Arizona. He said the La Loma land cost him fifty dollars an acre.
Salt River Valley and Maricopa County, home of Salt River Project, used synonymously in this work. Region pictured below produced over half of all Pima cotton grown in United States, 1912-1958.

Salt River Project

Relief map showing storage dams and main irrigation canals of the Salt River Project. Project lands are shaded a darker gray.
In 1941 a standby steam plant of 37,500 HP capacity was constructed at Crosscut at a cost of $2,300,000 to assure firm power and continued service to the Project in case of failure by any of the hydroelectric plants. The Project then had a combined generating capacity of 152,900 HP.

Horseshoe Dam, above Bartlett Dam on the Verde River, was built in 1944 at a cost of approximately $2,500,000. Spillway gates were added in 1949 at a cost of $925,000 to increase the domestic water supply for the City of Phoenix.

WATER RIGHTS VARY

We now find the following types of water rights on various lands in the Salt River Project:

1 - Normal Flow Water Rights

These were established by the Kent Decree of 1910. This is the first water right to the Salt and Verde rivers and is a right prior to stored water. This normal flow water right covers 151,083 acres of our total 240,000 acres, such water rights are dated from 1869 to 1909. The 1869 land has the first right to the use of normal flow of the rivers--then the 1870 land and so on up to 1909, if water is available. During a severe drought many of these lands would not receive any benefits from this normal flow water right.

2 - Stored and Developed Water Rights

All lands in the Salt River Project, having Capital Stock in the Association and having signed a water right application with the United States, have equal rights to stored water and water developed by Association pumps. This right covers the total of our 240,000 acres.

3 - Pump Water Right

This water right is acquired as before stated and may be so acquired until further notice. As of July 1, 1958, 156,873 acres had acquired 233,837 acre feet of pump water rights.
CHAPTER X

THE MARKETING OF PIMA COTTON

After the disastrous price decline following the harvest of 1920, enthusiasm for Pima cotton was lessened. Those who were in the business for a quick profit sought greener fields. Agriculturists at Sacaton and University of Arizona and some growers of the Salt River Valley still believed Pima cotton was a special product worth preserving. California and Texas growers went back to growing upland.

Actually, the California growers had poor luck in the venture into extra-long staple growing. When the price was highest in 1919, their crop was only 675 bales. In 1920 they put in 43,000 acres to Pima cotton and, because the lint yield was a pitifully small 107 pounds to the acre, the harvest was an unprofitable 9,650 bales of low-priced cotton. They reported a 100-acre planting in 1922 and were generally out of the Pima industry thereafter until 500 acres were planted in 1950.

Production of Pima cotton in Texas during the World War I was not sufficient to be recorded in the cotton statistics, but the United States Department of Agriculture in a news release dated May 14, 1921, found it necessary to
repeat a warning made in 1911 that the Egyptian-type cotton was not adapted to Texas conditions. The warning came as a result of complaints from growers who planted their land from a carload of Pima seed shipped into Texas for the 1920 season. (Since 1940 the Trans-Pecos region near El Paso has produced a high quality Pima cotton.)

The immediate problem facing the Pima growers in 1921 was to find a market for the huge 1920 crop of 92,561 bales (73,837 in Maricopa County, Arizona) at a time when eastern mills were flooded with a record 485,000 bales of Egyptian cotton imported in 1920. Other problems arose later, such as keeping Pima seed pure when surrounded with a large planting of short cotton as occurred in 1924 (122,000 acres of upland and 8,000 of Pima) in the Salt River Valley. New extra-long staple cotton varieties, with higher yields, were needed to make Pima a profitable industry.

**Arizona Pima Cotton Growers Association**

The Arizona Pima Cotton Growers' Association was organized in the summer of 1921. Sixty-five thousand bales of unsold Pima cotton at that time hung like the sword of Damocles over the market. Cotton produced at a cost of sixty cents a pound had to be sold for half and occasionally a third of that price. About 7,000 bales were sold at public auction. The new association, however, attempted to achieve a more orderly liquidation.
To avoid "dumping" the surplus of 1920 crop on the market as distress stock, warehouse storage in the Salt River valley was procured, and a trainload of Pima cotton was shipped to New Bedford, Massachusetts, for storage. These acts relieved the local congestion and provided, as well, a "spot" supply of Pima cotton near the mills. Warehouses in Phoenix and New Bedford both qualified under the United States Warehouse Act, which permitted the transfer of stored cotton from Arizona to Massachusetts by the exchange of warehouse receipts without refinancing.

By providing bond, the association was licensed to loan money to members on stored cotton from $1,200,000 credit given to the association from the War Finance Corporation, assuring 1921 crop financing for growers if

1"Returns from Cotton-Spinning Experiment," Arizona Producer, November 1, 1924, relates one unique attempt to use up the 1920 surplus stock of Pima cotton in a transaction not a part of the Pima Cotton Growers' Association business. This account dealt with the final returns of a consignment of 870 bales of 1920 Pima cotton shipped to Czechoslovakia in 1921. Under the plan, Arizona growers would be paid for the cotton from sales of fabric manufactured by a Czech mill. The plan failed, according to Department of Commerce investigators, because Pima growers were unable to guarantee a minimum annual baleage and, lacking this assurance, the spinners refused to go to the expense of adjusting machinery to care for a single shipment. Only fifty-five bales were actually made into cloth. The remainder was sold over a period of two years, some being shipped back and sold on the Boston market. Final settlement thirty months after shipment was less than the local market would have paid in 1921, according to officials of the Arizona Pima Cotton Growers' Association.
needed. (Only half of the authorized credit was used because many growers had already mortgaged their crop to the limit.)

Within a year, the 1920 surplus was greatly reduced. In the liquidation process some Pima cotton was consigned to Liverpool to compete with Egyptian varieties. A year after the association started, Secretary James reported a total of 15,424 (7,825 unsold) bales of Pima cotton on hand in the gin yards, warehouses and fields of the Salt River valley and 2,516 unsold bales in storage, including 632 bales in Phoenix, at other places. This presented a comparatively healthy situation as compared to the preceding year when 65,000 bales were reported held in the valley.  

The New Bedford Storage Warehouse Company, in a July 1922 bulletin, commended the Arizona Pima Cotton Growers' Association for its sound marketing policy which had extended the use of Pima cotton into areas never before reached:

The feature of the month has been the marked swing into Arizona-Egyptian or Pima cotton by many of the

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Manager James' report of July 1922 holdings of Pima cotton indicated that the bulk of the total carry-over of 15,524 bales in the Salt River valley was from the 1920 crop. Gin-yards reported 9,108 bales of the 1920 vintage and 3,805 from the 1921 harvest. An additional 2,516 unsold bales were reported in bonded storage warehouses: 1,614 bales in New Bedford, Massachusetts, with three companies (New Bedford, 1,482 bales; Stewart Bros., 32, and Clark-Payson, 100), and 632 bales with the Arizona Storage and Distributing Company, Phoenix.
mills normally using long-staple peelers. Many had never before tried Pima and some were still experimenting with it for the first time, but in the aggregate there are probably twice as many mills using Pima cotton as compared with a year ago. . . . Pima growers have shown great tenacity and courage in holding their cotton until such time as there was sufficient demand for it to bring a fair market price . . . not insisting upon figures high enough to bring Egyptian Sakellaridis in direct competition on equal terms, but preferring . . . to get more mills into the habit of using Pima by making it available at an attractive figure compared to any other long staple cotton. 3

The New Bedford bulletin reported that Pima cotton prices ranged on the Boston market from thirty-two to thirty-eight cents while Egyptian Sakellaridis of good grade was selling from forty to forty-five cents a pound. The seven-cent tariff, in effect only from May 21, 1921, to September 21, 1922, was a factor in holding the Egyptian import cotton above the price for the domestic product.

Sapiro Cooperative Marketing Plan
Adopted by Arizona Association

The Arizona Pima Cotton Growers' Association was formed under the authority of an act passed by the 1921 Arizona legislature as a purely cooperative, non-stock non-profit organization. Only actual cotton growers were

3 Arizona Producer, November 1, 1922, p. 1.
accepted for membership, each with one vote. The Arizona cooperative act was patterned on the Sapiro plan similar to laws since adopted by some forty states, which spell out certain procedures and privileges under which the producer would have some control over the marketing of his crop.

Aaron Sapiro, San Francisco lawyer who sponsored the plan named after him, came to Phoenix to help in the formation of the Arizona Pima Cotton Growers' Association, G. Harold

4 Dwight B. Heard of Phoenix was the first president of the association, refusing re-election in 1924 after three years of service. In 1921 he attended a world cotton conference at Liverpool and Manchester, England, and appeared at congressional hearings at Washington dealing with the emergency tariff law of 1921 which placed a seven-cent import duty on extra-long staple (1-3/8 inches and over) from May 21, 1921, to September 21, 1922. While in Washington he invited Eugene Meyers, head of the War Finance Corporation, to come to Arizona to look into the association's activities which resulted in release of $1,200,000 credit upon which growers could borrow. He also visited several mills in the East to urge the use of Pima cotton. Charles M. Morgan was the first association secretary, serving until he became editor of The Associated Arizona Producer, launched by the association in March 1922. P.M. James, association manager, then combined his duties to include the office of secretary-treasurer at a $4,200 salary. James R. Ray, with fourteen years' experience with Sea Island cotton in Georgia and Florida, was hired to classify Pima cotton (salary $3,600). To promote uniformity and a possible better price, he sorted crops into lots of fifty with each lot as near in grade and staple as possible. The association also employed an expert gin inspector who visited all gins twice a week in a campaign to raise the quality of work above previous standards. With 952 members enrolled in the first year the association reported a volume of $1,787,200 the first year. These facts appeared in a report made by George Butterworth, USDA cotton expert, sent to Arizona to help maintain the quality of Pima cotton. His report was printed in The Producer editions of March 15 and April 1, 1922.
Powell, general manager of the highly successful California Fruit Growers' Exchange, was also consulted (and aided in setting up the Arizona Pima cotton cooperative.)

The key feature of the plan was an iron-clad contract binding the grower to deliver his crop to the association for marketing for a stipulated number of years (five years in Arizona). The Pima Cotton Growers' Association membership was confined to the Salt River valley and to Pima cotton growers in the initial years, but was opened in 1922 to include Yuma Valley upland growers.

The Arizona association differed from most marketing groups in that seed was sold also. In order to secure control of the seed, the policy of buying cotton in the seed was adopted. Believing that local buyers were paying too little for cotton-seed, a contract for the sale of 3,000 tons of association seed was negotiated with an outside mill, giving the organization average Texas prices at f.o.b. valley points. This forced the local market from $12.50 to $20 a ton (later dropping to $16).

Fred J. Elliott, attorney for the association, cited other benefits the organization secured for growers:

Almost immediately the association, following an interview with the president of the Goodyear company, obtained a reduction in the ginning rate from $24 per bale to $15, and seed prices were raised to $25. Insurance rates were cut almost in half. Instead of storing cotton in
the gin yards it was stored in bonded warehouses at about one-half the gin-yard rate.5

C. O. Moser, secretary of the American Cotton Exchange, told Pima cotton growers in June 1922 that the Sapiro marketing plan was "sure-fire" and that there had been no failures of cooperatives since Sapiro established the fundamentals in 1913.6

However, the Pima Cotton Growers' Association soon encountered violations among members, and the first of a series of actions against "contract jumpers" was instituted on October 7, 1922. The suit sought to restrain the member "from disposing of any cotton produced or acquired by or for him" and asked judgment for $6,000 as damages and also the cost of the action.7

The revolt developed seriously when on July 21, 1924, some 100 dissident members in a mass meeting held at Mesa demanded cancellation of their contracts and distribution of their share of accumulated reserve. These demands were rejected, but on October 1, 1924, the association announced

5Fred J. Elliott, "Arizona's Big Co-op," Producer, October 1, 1929. When the association was organized and several years thereafter, Elliott was the association attorney; in 1929, he was a vice president.


7"Association Sues to Enforce Contract," Producer, October 15, 1922, p. 3.
that the dissolution movement was ended ("amicably settled") by the expulsion of certain members, who had given up their rights in the property and reserves of the association.®

The association surrender on the compulsory phase of the marketing contract virtually ended the Sapiro-model cooperative upland in Arizona as it pertained to cotton. The association opened its facilities to members and non-members alike under liberalized contracts. Pima cotton became a minor role in the association business despite its title. In 1924-25, the association handled 8,864 bales of upland and 884 bales of extra-long staple; in 1925-26, 16,346 bales of short staple and 4,902 of Pima cotton. The business followed the variety diversion trend existing among Salt River valley growers.

Adequate Financing for Growers

The Pima Cotton Growers' Association, acting through its subsidiary, Arizona Cotton Processing Company, purchased a one-fourth interest in the Mutual Cotton & Oil Company, which in turn bought the Goodyear and Firestone cotton mills and gins in 1923. In 1921 the War Finance Corporation advanced $1,200,000 in credit and in 1922 eastern banks made money available to growers through

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®"Dissolution Movement Ended," Producer, October 1, 1924.
association efforts. In April 1925, the Arizona Agricultural Credit Corporation, with $80,000 capital advanced by the Mutual company, was formed, permitting $400,000 to be loaned to cotton growers through the Intermediate Credit Bank of Berkeley, California.

Under a marketing agreement with the Arizona Processing company, the association announced on December 1, 1926, that it could advance seventy-five per cent of the market value of cotton to growers and store the cotton in a fire-proof warehouse in Phoenix. The storage plant was equipped with a sprinkling system to secure lowest possible insurance rates. Under this plan, cotton was placed in pools of even-running grades and staples and held for a favorable market.9

The Arizona Pima Cotton Growers' Association qualified as a strong cooperative but came to an end in less than a decade. Its accomplishments were momentous but having no control over the market, the association fell victim to the price declines of the farm depression given emphasis in the stock market crash of October 1929. After that, a new theory of voluntary control as a way to bring greater returns to growers was in the ascendancy: cut acreage,

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9Arizona Producer, November 1, 1927. K. D. Hellwarth, president of the Arizona Pima Cotton Growers' Association, cited these facts in a report of association activities.
grow less, decrease supplies, and prices will rise.  

In 1930, Anderson, Clayton & Co., world's largest cotton ginner, compressor, grower, and broker, through its subsidiary, Western Cotton Producing Company of Phoenix, contracted with Arizona Cooperative Cotton Growers as a new marketing organization under which fifty per cent of sale profits, up to five dollars per bale on lint and

10At a 1930 conference of agricultural county agents of Arizona held at the call of P. H. Ross, director of the University of Arizona Agricultural Extension Service, Harry A. Stewart of Maricopa county was reported by *The Producer* "as the hero of the day when he was able to report a prospective decrease of 40,000 acres from last year's mark of 145,000." In 1933, Arizona cotton growers plowed up 21,321.48 acres for which they received $250,309 in cash and options on 13,334 bales of surplus cotton which if sold above six cents a pound would result in additional apportionment. Cotton acres plowed up by counties were: Yuma, 1,944.33; Graham, 2,052.90; Pinal, 7,786.25; Maricopa, 9,538. ("Arizona Does Her Part," *Arizona Producer*, August 1, 1933, p. 1). Pima cotton was exempt under the Bankhead Act which later established acreage controls over upland cottons. Conflicting opinions as to whether upland growers could grow the Pima variety over and above allotments on upland kept growers in a quandary much of the time. One ruling which disturbed growers stipulated that the staple-length of over 1½ inches had to be proven at the expense of the grower before plantings outside the allotment would be permitted; when proven, then the upland would be increased to the extent of acreage planted to extra-long staple. In tests of the previous five years only 3.7 per cent of all Pima cotton grown was under 1½ inches. Growers thought the rule unfair, and Kenneth McMicken and Walter Smith were selected to secure revision of the rule which eventually prevailed. ("Grief for Pima-Growers," *Arizona Producer*, August 1, 1934, p. 1.) George W. Barr of the University of Arizona Department of Agricultural Economics in a 1944 trip to Washington was able to secure $300,000 additional funds for Pima cotton growers under the 1942-1943 government purchase programs by securing a new interpretation on price level.
ten dollars per ton on cotton-seed, would be shared with the grower.  

**Ginning and Compressing**

Pima cotton from 1917 to 1920 primarily served the rubber industry; eighty-five per cent of production went into this area of consumption. By 1932-33, 23.3 per cent of the Pima crop went into tire fabrics, 11.9 per cent into sewing thread, 60.7 per cent into fine cloths, and 4.1 per cent into other uses.  

In the transition to new uses, Pima growers found the spinners more critical of the condition of fiber received at mills. The Arizona Pima Cotton Growers' Association, through its official paper, campaigned vigorously for improvement.

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11. *Producer*, November 15, 1930, p. 1. Growers agreed: (1) To gin cotton with Western if charges were as low as open charges in district; (2) To sell seed if price was equal to above-board price of district; (3) To sell lint to Anderson, Clayton if price was as high as offered by other buyers at the same time. Pima cotton was not a factor in the agreement.


13. *Producer*, March 15, 1922, first edition of the association's official paper, pictured Pima and Egyptian cotton bales on its front cover over this caption: "Pima cotton . . . has always reached the delivery point at the mills in a disgraceful condition, with bagging badly torn, bands missing, and in some cases ragged . . ."
Horace H. Willis, cotton specialist for the United States Department of Agriculture, made a tour of New England mills in late 1922, to find out if the faults mills complained about could be corrected.¹⁴

Some of the mill complaints of the ragged condition in which Pima cotton was received was due to the job done by railroad compression plants of Oklahoma and Texas to conserve shipping space. This condition was corrected in 1925, insofar as Arizona cotton was concerned, by the construction of a modern compressor at Phoenix by Arizona Compressing & Warehouse Company. ¹⁵ Phoenix became thereafter the concentration point for cotton grown within 100 miles of the state's capital city. In addition to its other facilities, the plant qualified as a federal bonded warehouse under the public warehouse act administered by the United States Department of Agriculture. Receipts issued by the company for stored cotton were accepted as collateral for loans at all banks, including the federal reserve bank.

¹⁴Horace H. Willis, Utilization of Pima Cotton (USDA Bulletin 1184, November 1923), p. 18. The author found the careless compressing done by railroads at Oklahoma and Texas points en route was undermining Pima's popularity in competition with the well-baled Egyptian imports.

¹⁵Arizona Producer, August 15, 1925, p. 1. The plant covered two and a half blocks, had the "last word" in modern installation with a normal eight-hour-day capacity of 1,000 bales a day (two bales a minute); employed 125 men in season.
With the establishment of the Pima industry in the Salt River valley, a diversity of gins and methods were employed. Some gins formerly had been used in Sea Island areas of the Southeast. Various kinds of cleaning and handling devices were attached, some carried over from saw gins with which many operators had their previous experience. The diversity of mechanical equipment resulted in different appearances in the lint, depending upon how it was handled in the ginning process.

Actually, seeming lack of uniformity was more apparent than real. This was the conclusion of James S. Townsend, a man of long experience with roller-ginning in South Carolina, after a tour of mills and an inspection of Arizona gins, reported in 1925:

In reality, the select Pima variety is much more uniform than any of the seed stocks that were secured from Egypt, and the varied appearance of the bales has been due to the mechanical condition of the cotton produced by the methods employed in the different ginning establishments.16

Townsend spent several months checking roller gins in Salt River valley and was able to effect many improvements in the quality of fiber produced. In 1928 there were eighteen Pima gins in the valley with "stands" varying from one to twelve with a total combined capacity of 330

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bales per day. A single "stand" ginned one bale of Pima cotton per day. 17

Practically all Pima cotton was consumed in American mills, the bulk in New England and remainder in South­eastern states and some in California.

In the early days of the industry, Arizona cotton was shipped to Galveston, Texas, and thence by water to New England or designated destination. By 1928, almost all Pima cotton both for domestic and foreign use was routed through California. 18

In a survey of cotton marketing in the irrigated Southwest for 1935-36, it was found that 90.3 per cent of all Arizona cotton was shipped through the Los Angeles port. The remainder, probably Pima cotton (9.7 per cent) was routed to domestic mills in the southeastern states (7.1 per cent) and northeastern states (2.5 per cent). The same survey reported that after 1931 no cooperative

17E. A. Shaw & Co., Arizona Pima Cotton (Boston: June 1928), p. 15. "A "stand" was one unit of gin machinery.

18Ibid., p. 17. Shaw wrote: "As shipments via the Texas ports cost considerably more than via California ports and as the Texas port facilities are insufficient for handling shipments as speedily as those of California, almost all Pima both for export and United States con­sumption is routed through California." Now Texas ports are used, especially for Pima cotton. In a comprehensive survey undertaken in 1959 by representatives of Arizona and New Mexico universities, the advantages of Texas ports are noted.
marketing organizations were located in Arizona. Several cooperatively-owned gins were limited to ginning only.  

Houston and Galveston, Texas, are now concentration points for extra-long staple cottons, according to the latest marketing survey reported in July 1959.

Current marketing procedures follow this pattern according to the information gathered:

Seventy-seven per cent of the buyers interviewed purchased Pima S-1 direct from farmers. Some buyers also made a high proportion of their Pima S-1 purchases from finance companies which had financed the growers' operations or from seasonal pools. . . . After the buyer purchased the cotton from the grower he stored it locally until carload lots were available for shipment either to domestic or foreign mills. . . . Galveston and Houston are excellent for concentrating Pima S-1 because it can be moved either to domestic or foreign mills from there and the cotton is moisture conditioned to environments similar to those of the mills where located.

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19 Wright and Kennedy, op. cit., table 39, p. 70. According to the survey about fifty-three per cent of Arizona cotton production was shipped to Phoenix for concentration and compression. Almost forty per cent was shipped flat (not compressed) to Los Angeles harbor for compressing. Arizona cotton made up forty-four per cent of total cotton receipts at Los Angeles. About sixty per cent of these shipments went to the Orient, principally Japan which then provided the principal market for Arizona's upland production.

20 Carl R. Hall and Charles A. Wilmot, Marketing Pima S-1 Cotton, July 1959. The authors are agricultural economists, serving with the New Mexico (Hall) and Arizona (Wilmot) agricultural experiment stations. The study was sponsored by these two college agencies and the USDA Agricultural Marketing Service.
Marketing During World War II

Following Pearl Harbor (December 7, 1941), the government turned to American-Egyptian cotton growers of the southwest to provide some of the sinews of war. The uncertainty of Egypt remaining in Allied hands and finding sufficient shipping space even if she did had users of extra-long staple worried.

On February 5, 1942, a 1942 goal of 150,000 acres of Pima cotton was announced as well as a government purchase program. "On March 14, the goal was raised to 300,000 acres . . . and more, if the seed supply permits" and the support prices were raised. The plantings totalled 192,900 acres in the three Pima-growing states, and the harvest of 73,808 running bales was second only to that grown in 1920. The 1943 goal was reduced to 160,000 acres; the harvest, 59,600 bales.

World War II introduced a new phase of marketing insofar as Pima cotton was concerned. For the first time, extra-long staple became a basic crop and as such became eligible for loans and price supports which heretofore had been extended only to the upland varieties.

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Under the 1942 purchase program, the government first offered thirty-three cents a pound, net weight, for grade No. 2 1½-inch staple with differentials for other qualities as specified.

When a higher goal was announced the support price was raised to thirty-eight cents a pound, and later again raised to 42.75 cents and finally to 43.25 cents. These prices seem low as compared with stockpile purchase rates for 1951-52 when the government paid $1.05 and $1.07 for extra-long staple cotton.

During the 1942 picking season, the free market prices generally exceeded the government purchase prices and only 5,572 bales of the 74,000-bale crop were sold to the Commodity Corporation.  

Growers were unhappy with the defense program as administered in 1942, and a general exodus from growing extra-long staple cotton came in the second half of the 1940 decade.

The principle discontent was centered on the government's unfilled promise to provide labor to harvest the fiber for which the war defense board had asked.

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22Ibid., p. 5. McLure, op. cit., p. 37. reported that the government purchase programs of 1942 and 1943 and the loan programs on crops of 1944 through 1948 were not high enough to relation to that for other cottons to cause farmers to plant larger acreages of the American-Egyptian cotton.
be grown. Much of the 1942 Pima cotton crop remained unpicked and because of late picking resulting damage lowered grades. As a consequence, many growers let the cotton seed itself and reaped "stub" cotton in 1943.

In 1943-44, the price ratio for Pima cotton was 2.4 times over ordinary long-staple prices. By 1946-47, the price ratio was down to 1.3 times, which contributed to the near-extinction status of the extra-long staple crop in the late 1940's.24

23 Much bitter feeling was engendered during the 1942 labor difficulties. The War Man-Power Commission and growers disagreed violently on the type of contract for Mexican braceros. There was an attempt to recruit pickers from Japanese evacuees in camps at Sacaton and Parker which proved disappointing. The army sent in troops for guard duty. The Farmer (November 7, 1942) reported that three companies of colored soldiers were guarding 160 Japanese pickers, and called for the soldiers camped at Papago Park and Fort Huachuca to pick the cotton. Papago Indians were finally used effectively and "victory labor volunteer groups" made up of gray-haired men and women, little children, students, merchants, big business executives, housewives did part-time work. In Graham county, high schools at Solomonville, Safford, Thatcher, Pima, and Fort Thomas permitted students to be absent two afternoons a week to pick cotton. Their earnings up to November 20 was reported "at least $40,000." (Farmer-Producer, December 5, 1942, p. 1.) As World War II neared its end, German and Italian prisoners-of-war quartered at a large camp near Florence, Arizona, were helpful in picking Arizona's cotton. They worked under contract arrangements between the army and the grower.

Plant breeder at University of Arizona since 1916. Awarded honorary degree of Doctor of Science from Alabama Polytechnic Institute, Auburn, Alabama, his alma mater, in 1956, for outstanding service to agriculture. Here he admires his Pima S-1.
Breeding cotton is a science based upon genetics. Profound as this term sounds, Walker E. Bryan, University of Arizona plant breeder, insists that the process is simple. Only two things are necessary: (1) Selection of the plant and (2) control of the pollination.

Plants are selected by a field inspection of growing cotton and such as show promise of high quality and yield are set aside and the seed used for progeny planting the following year. Plants which appear to be satisfactory in this selection might prove otherwise in progeny cultivation; if this is the case, they are discarded. Progeny plants which continue to show desired characteristics are preserved year after year for further testing until a superior variety, worthy of commercial growth, has been established.

Controlling the pollination means, first, that only the desired pollens are permitted to be transmitted from one plant to another. The breeder takes the pollen from such growings as have the desirable characteristics he wishes established in a new variety and mixes them in the pod of other plants. (Technically, the pollen from the anther of
one plant is transferred to a stigma in a flower of a different plant.)

Secondly, pollination must not be permitted from any unwanted source. The preventative lies in carrying on breeding programs in areas well isolated from fields of any other cotton growth. Wind and insects (particularly bees) will transmit cotton pollen in fields close together.

Plant selection requires knowledge of cotton's properties. For example, in the fall of 1959, Bryan personally inspected 9,000 plants in the cotton nursery area maintained by the University of Arizona, called the Casa Grande farm near the railroad overpass on the northwest edge of Tucson. From this group, 400 plants were selected which appeared to him to have good potential character. The seed from each of these plants is planted the following year in progeny rows. There are then 400 rows from which selections will be made for next succeeding year. Only by this process can the future of the industry be protected and progress.

The principal objectives in the Pima cotton breeding program have been high production of lint fiber (to stay in competition with upland for yield, in relationship to acreage), early maturity (to avoid possible weather damage of late seasons), adaptability to mechanical harvesting (to cut down harvesting costs), improvement in fiber
quality (to meet spinners' demands), and resistance to
disease and insect injury.

**Value of Pima S-1 Boon to Growers**

Breeding new varieties is a lengthy process. In the case of Pima S-1, thirteen years elapsed from the first crossing in 1934 until a single plant selection was made in 1947, giving rise to the variety now in general use among extra-long staple cotton growers of the Southwest. After three years of testing at the University of Arizona experiment farm at Tucson, the Bryan selection was transferred to the United States agricultural seed station at Sacaton for further testing and seed increase.

Pima S-1 originated as a single plant selection from four widely-different varieties, each of which possessed some desirable quality the breeder sough to incorporate in a single new variety. The breeding stock included the original Pima, Stoneville 4 (upland), Sea Island (later type, with low plant), and Tanquis, grown in Peru, South America. Characteristics used as a basis of selection were low plant, productiveness, large well-opened bolls, medium length of lint, and high lint percentage.

The single plant resulting was the product of six basic crosses between the original varieties and selected plants within the crosses, each of which had one or more desirable characteristics.
In four years of testing (1950-1953), Sacaton found Pima S-1 the highest-producing variety of any extra-long staple cotton ever grown in Arizona. This conclusion was confirmed by Robert H. Peebles, station superintendent, who himself had only recently developed Pima 32, hailed as a variety of exceptional high production. In tests made in four different areas, Pima S-1 out-yielded Pima 32 from sixty pounds to 235 pounds of lint to the acre. The average lint production of Pima S-1 over Pima 32 in these four points was 128 pounds to the acre or a 22.3 per cent increase. Pima S-1 had almost a five per cent higher lint ratio (34.2 per cent) over Pima 32 (29.6 per cent). The new variety also promised an adaptability to machine picking.

In comparative tests on quality conducted in eleven mills in 1954 by the National Cotton Council, Pima S-1 was

<table>
<thead>
<tr>
<th>Test Point</th>
<th>Pima S-1</th>
<th>Pima 32</th>
<th>S-1 Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacaton</td>
<td>640</td>
<td>580</td>
<td>60</td>
</tr>
<tr>
<td>Mesa</td>
<td>850</td>
<td>615</td>
<td>235</td>
</tr>
<tr>
<td>Las Cruces, N. M.</td>
<td>535</td>
<td>384</td>
<td>151</td>
</tr>
<tr>
<td>Ysleta, Texas</td>
<td>778</td>
<td>712</td>
<td>66</td>
</tr>
<tr>
<td>4-year total</td>
<td>2803</td>
<td>2291</td>
<td>512</td>
</tr>
<tr>
<td>Yearly average</td>
<td>701</td>
<td>573</td>
<td>128</td>
</tr>
</tbody>
</table>


2 Troy Mullins, Competitive Position of American-Egyptian Cotton (New Mexico Agricultural Station, October 1955), p. 5. About sixty per cent of farmers interviewed in Graham county, Arizona, in 1954 said some of their Pima cotton was harvested by machine. Field and grade loss were balanced by saving in labor costs.
cited in nine categories as superior to both Pima 32 and the imported Egyptian Karnak.³

Pima cotton acreage yield had remained static up to 1945 (less than 250 pounds an acre). Upland yield had showed a gradual increase.⁴ After Pima S-1 was given to growers for the 1954 crop, acre yield apparent in tests continued to show remarkable increase over earlier varieties:

<table>
<thead>
<tr>
<th>Year</th>
<th>Acre Yield</th>
<th>Year</th>
<th>Acre Yield</th>
<th>Year</th>
<th>Acre Yield</th>
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<tbody>
<tr>
<td>1948</td>
<td>320 lbs.</td>
<td>1952</td>
<td>436 lbs.</td>
<td>1956</td>
<td>699 lbs.</td>
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<tr>
<td>1949</td>
<td>327 lbs.</td>
<td>1953</td>
<td>375 lbs.</td>
<td>1957</td>
<td>587 lbs.</td>
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<tr>
<td>4-year total</td>
<td>1214 lbs.</td>
<td>1576 lbs.</td>
<td>2605 lbs.</td>
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<tr>
<td>Year average</td>
<td>314 lbs.</td>
<td>369 lbs.</td>
<td>651 lbs.</td>
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</tbody>
</table>

³John J. Brown and others of Southern Research Laboratory, New Orleans, Louisiana, "Evaluation of Yarn Properties and Processing Performance of Pima S-1 Cotton," Textile Research Journal, May 1955, pp 413-414. Comparing with Pima 32 and Karnak, tests found Pima S-1: (1) Equal to the others in general processing efficiency; (2) Nepped less than either of others; (3) Consistently made stronger yarn than Karnak for a given twist and equalled Pima 32 in strength; (4) For given draft, made yarns stronger than the others; (5) Made consistently more uniform yarns than either; (6) Had seventeen per cent more elongation than yarns produced by the others; (7) In double-creeled roving was stronger and more uniform; (8) Made two-ply yarns showing same percentage gain in strength as others, and (9) Response to mercerizing and to subsequent dyeing slightly better than the other cottons.

⁴Hathorn, op. cit., table 2, p. 58, Pima; table 5, p. 62, upland yields (no upland, 1917-1920). Comparative acre yields by specified periods for Arizona cotton production were: PERIOD LBS. PIMA LINT LBS. UPLAND LINT
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<table>
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<tbody>
<tr>
<td>1912-1920</td>
<td>232</td>
<td>305.5</td>
</tr>
<tr>
<td>1921-1930</td>
<td>252</td>
<td>332.2</td>
</tr>
<tr>
<td>1931-1940</td>
<td>234.5</td>
<td>444.3</td>
</tr>
<tr>
<td>1941-1945</td>
<td>234</td>
<td>432.0</td>
</tr>
</tbody>
</table>
The development of Pima S-1 has placed the industry on a basis where price and quality competition with foreign imports and synthetics has become possible. Consumption and exports since the advent of Pima S-1 have reached proportions never before attained.

Under a program instituted by SuPima Association of America, Pima mill consumption, averaging 720 bales a month in 1954, was increased to 2,390 bales monthly in 1955, and 5,585 bales each month in 1956. For the first time since the industry was started in 1912, United States mills in 1956-57 consumed more Pima cotton (sixty-one per cent) than imported Egyptian (twenty-five per cent).^5

The success of Pima S-1 is the culmination of long experience and close cooperation among breeders, growers, pure seed associations, and marketing groups.

In 1912, at the time the first commercial crop was grown by seventy-five farmers in the Southwest, O. F. Cook warned: "With the usual neglect of selection, crossing of varieties in the field, and a mixture of seed in public gins, the uniformity of stock is usually lost before it has been out of the breeders' hands for more than two or three years."^6

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^5Rafler, op. cit., p. 5.

This prediction was proven true, especially in 1924 when Salt River Valley cotton growers almost abandoned the Pima industry.

Survival of the industry rested with the growers who formed associations to receive the seed from the breeder and who placed the new varieties into production in ways designed to maintain its good qualities. This work was centered at Sacaton until 1957, when it was transferred to the new University of Arizona Cotton Research Center near Phoenix.

**Honors Accorded Pima Cotton Breeders**

In the history of Pima cotton development, three breeders were recognized for their outstanding service to the industry. The University of Arizona accorded Thomas H. Kearney an honorary LL.D. (Doctor of Laws) degree in 1920 and Robert H. Peebles an honorary B.S. (Bachelor of Science) degree in 1955. The Alabama Polytechnical Institute of Auburn, Alabama, awarded Walker E. Bryan, a 1911 graduate and native Alabaman, an honorary D.Sc. (Doctor of Science) degree in 1956. All of these honors were accorded because of work accomplished in the field of Pima cotton.

Kearney, the pioneer in the industry, developed four varieties of American-Egyptian cotton, each one better than its predecessor, and brought out new facts useful in the
science of genetics. More than 100 important publications and articles in scientific and trade journals record the results of Doctor Kearney's works.\(^7\)

Extra-long staple varieties produced from Kearney breeding stock and the years grown included the original Yuma (1912-1917), Pima (1916-1940), SXP (1934-1949), and Earlipima which had only limited growth but was used by Peebles in producing his best variety, Pima 32.\(^8\)

Kearney's first experiments, starting in 1902, were conducted on the farms of the Yuma Reclamation Bureau in cooperation with W. E. Peterson, station superintendent, who collaborated on some of the first reports. After the 1905 spring floods had wiped out the experimental plantings, breeding activities two years later were transferred to the Gila Indian Reservation in central Arizona. Here Kearney worked with E. W. Hudson, superintendent of the

\(^7\)Statement of USDA Agricultural Research Administration in letter circulated for trade use under date of June 9, 1944. Kearney retired in 1944 after 50 years service in USDA and died in 1956 at the age of eighty-two years in a San Francisco hospital.

\(^8\)Brown and Ware, op. cit., p. 71. Yuma was produced from Egyptian Mit Afifi and Pima was developed from Yuma. SXP resulted from several crosses of Pima with Egyptian Sakel, from seed brought to Sacaton in 1914 by American Thread Company. Earlipima came from a backcross of SXP stock with Pima.
Sacaton station farm until 1916. S. H. Hastings succeeded Hudson until 1920 when he joined the Southwest Cotton Company. Later Hastings returned to the Department of Agriculture.

Chalmers J. King, superintendent from 1920 until his death at Sacaton in 1945, contributed greatly to the Pima industry in seed programs and public speeches. His successor was Robert H. Peebles, a close associate of Kearney. Peebles continued residence at Sacaton from 1924 until his death there in 1956. He trained in

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9 E. W. Hudson bred the Gila extra-long staple variety while at Sacaton, used but a few years exclusively on Arizona Indian reservations. His liaison work with farmers of the Salt River Valley while he was superintendent at Sacaton, a time when cotton-growing as an industry in Arizona was in its swaddling clothes, served as a sound basis for subsequent expansion. The University of Arizona extension service had arranged for his full-time service to work among extra-long staple growers starting in 1916, the same year the Goodyear company moved into Arizona and engaged him to supervise seed selection and planting on some of the 24,000 acres of desert land bought that year by the Southwest Cotton Company. By 1918, Hudson was a "large planter in his own right." (McClintock, op. cit., p. 7). He is now primarily a cattle farmer with extensive holdings in California's Imperial valley, although he continues to have his home near Tempe.

10 Arizona Producer, February 1, 1926, p. 3. Sample quotation from a King speech: "Growing of upland might be developed into a highly scientific industry in this region (Salt River valley) but 50 million acres in the South can be put to the same uses as our few thousand acres and we rise or fall with a population of millions that has never become notably prosperous during sixty years of cotton growing."
plant breeding under George J. Harrison. When Harrison was transferred to Shafter, California, in 1934, Peebles took charge of the Sacaton extra-long staple breeding program at Sacaton, and was personally responsible for two American-Egyptian varieties: Amsak, in limited production

George J. Harrison was an extra-long staple cotton breeder at Sacaton from 1920 to 1934 and did much work with Kearney on the SXP variety, which came into commercial use in 1934, the year he was transferred to Shafter field station in California. In his new assignment, from a single plant selected from an Acala 1517 field in 1939, he developed Acala 4-42, an upland "said to be the finest short staple in the United States." (Arizona Farmer, March 15, 1958, p. 28). The first increase seed was grown in 1945 and by 1950 was practically the only variety grown in California. The relatively rapid and complete replacement is possible under the 1925 one-variety cotton community law passed by the California legislature in 1925 which provided that one and only one variety could be planted thereafter in Riverside and cotton-growing counties of the San Joaquin valley. The effectiveness of the law was proven by the 1954 plantings: 99 per cent of California's 907,000 cotton acres were planted to Harrison's Acala 4-42. The same year, only 81 per cent of Arizona's 416,000 cotton acres was planted to the state's No. 1 variety, Pressley's Acala 44. Two other varieties made up California's remaining one per cent, whereas Arizona had seven others named and more lumped as "all other" among varieties in the 19 per cent (80,000 acres) not planted to Acala 44. (Harry Bates Brown and Jacob Osborn Ware, Cotton, McGraw-Hill, New York: 1958, p. 56). Harrison now serves as consultant and director of fiber research for Calcot, Ltd., a marketing cooperative which reported handling 24 per cent of California's cotton crop and 12 per cent of Arizona's cotton harvest of 1956-57. (Arizona Farmer, July 20, 1957, p. 35). Harrison has been awarded the farm bureau distinguished service award and was cited by the California legislature for his service to agriculture. (Arizona Farmer, March 15, 1958, p. 1.)
from 1944 to 1949, and Pima 32, an excellent variety, grown from 1949 to 1959.\textsuperscript{12}

The unique part of Peeble's career is that although he lacked a formal education he became an outstanding plant breeder and scientist.\textsuperscript{13} He worked closely with Kearney and Harrison. Peebles and Kearney collaborated in a study of Arizona flora and jointly published a monumental work, "Flowering Plants and Ferns of Arizona," released in 1942 by the United States Department of Agriculture with Peebles as junior author. A second edition was published in 1952 by the University of California.

In addition to breeding two commercial varieties of Pima cotton himself, Peebles recognized the merits of Bryan's Pima S-1 and supervised the testing of the new

\textsuperscript{12}USDA Information Service (L. E. Childers letter, October 23, 1957) states: "Amsak, released in 1943, . . . was accepted by mills for having fiber spinning quality equivalent to the best cottons imported from Egypt. Pima 32, released in 1949, . . . had spinning properties equal to Amsak and gave yields 20=25 per cent over the best American-Egyptian varieties grown previously."

\textsuperscript{13}Ibid., Peebles graduated from Hollywood high school, Los Angeles, and attended U.C.L.A. one year (1920-21) after service in World War I. He was preparing to accept a promotion which would have taken him to the agricultural center at Beltsville, Maryland, when he died unexpectedly at Sacaton in 1956. William Waddles, who had been at Sacaton intermittently since 1939, was given charge of the USDA extra-long staple breeding program, until he was given a Beltsville promotion in 1957. Dr. Carl Feaster is now the extra-long staple cotton breeder for the USDA at the cotton center.
variety in the field, in the fiber laboratory, and in the mills, and multiplied the planting seed as rapidly as possible, saving one year in the process by taking progeny increase to Iguala, Mexico, in the winter of 1950. Peebles was widely commended for his work in developing Pima S-1 in which he "demonstrated his ability as a leader working with federal and state workers, mill men, and farmers to bring out this outstanding new variety in the shortest possible time."  

Walker E. Bryan came to the University of Arizona in 1916 and was associated with Elias H. Pressley in the plant breeding department of the College of Agriculture. Bryan specialized in extra-long staple breeding and Pressley in upland. Both men developed varieties in major use in Arizona at the present time. Of the 416,000 acres planted to upland by Arizona growers in 1954, 81 per cent (336,000 acres) were planted to Pressley's Acala 44. (fn. 11). In 1959, extra-long staple plantings in Arizona, New Mexico and Texas totalled 76,200 acres; 75,000 of these acres were in Bryan's Pima S-1 variety. 

The citation given Bryan by the Alabama Polytechnic Institute read in part:

14 Ibid.

. . . he pioneered new methods and made significant contributions to the modern science of plant breeding; who received national recognition for developing the long-staple, Pima S-1 cotton that has outyielded commercial Pima varieties by twenty-two per cent, that has opened to southwestern growers new markets once dominated by foreign-grown long staple cotton, and that has added several million dollars annually to growers' incomes; and a scholarly, well-informed scientist who has devoted his life to envisioning and pioneering new techniques and to training promising young men as future plant breeders.  

Pima Cotton Pure Seed Associations

Keeping Pima cotton seed in the pure state received from breeders was relatively simple up to 1922 because the Salt River Valley was virtually a one-variety cotton community. When valley growers planted 122,000 acres to upland cotton and only 8,000 to the Pima variety in 1924, the industry was seriously threatened.

Roguing and inspection of extra-long staple cotton fields had been a practice in the Salt River Valley since 1913, and up to 1924 was managed by the Tempe cotton exchange. The task became too great for the exchange after the large upland plantings of 1924. So a new organization, the Maricopa County Farm Bureau Pure Seed Association, was set up by growers, ginners, and buyers to protect the seed.

16USDA Agricultural Research Service, News Letter, June 26, 1956. Mitchell Landers, speaking as an officer of SuPima association in October 1955, said; "Of course, the entire program in behalf of our long-staple cotton would have been impossible but for the development of Pima S-1 by Dr. Walker E. Bryan at the University of Arizona." (Farmer, October 29, 1955, p. 41).
Dividing the valley into ten regions and subdividing into school districts, inspectors visited 641 farms between July 20 and September 19, 1925, certified 456 as satisfactory, rejected 168 as failing to meet required standards, and had seventeen farms still in process of inspection. In all, inspectors from the Sacaton field station and university farm schools carefully examined over 33,000 acres of Pima cotton plantings in a two-month period, issued certificates of approval to 23,169 acres and rejected almost 10,000 Maricopa county acres as lacking prescribed cleanliness.17

In the opinion of Kearney, few Pima cotton fields in 1925 were sufficiently isolated from other cotton to make the seed safe for planting. To assure the ultimate in seed purity for the 1927 plantings, Pima cotton seed, grown in the Tempe pure-seed district in 1918 and 1920 and since stored in sealed sacks, was used in 1926 to secure the seed purity of the 1927 crop. By an arrangement with the Southwest Cotton Company, this good seed was planted on the Litchfield ranch at least a mile distant from the

17 Arizona Producer, October 1, 1925, p. 6. The process of roguing takes place when the cotton plant is in blossom. Growers did their own roguing, weeding out inferior and diseased plants and all hybrids or upland growth, after which experts checked the fields for certification. About 3,000 acres in the valley were not put to the inspection test, primarily because growers failed to rogue their fields. Inspection was done without cost to the grower. Certificates signed by inspectors assured buyers that the cotton came from rogued fields, "in an endeavor to maintain a pure and unmixed strain of Pima cotton."
nearest short staple crop. The company agreed to pick and gin the crop under conditions preventing any mixing of seed.

The pure seed project carried out at the Litchfield Park farm, in cooperation with the Western Cotton Oil Company of Phoenix, made available for 1927 plantings 300 tons of absolutely pure Pima planting seed, sufficient to put about 20,000 acres into crop. The Maricopa County Farm Bureau Pure Seed Association found it necessary to supplement this supply with a crop from 1,200 additional acres, inspected by federal Department of Agriculture and University authorities, to provide an additional 300 tons of seed.

Pima cotton plantings in the Salt River Valley reached 44,000 acres in 1927, the largest acreage since 1922, and for the final time exceeded upland plantings (39,185 acres). By re-establishing the seed purity in the 1927 crop, the Pima industry survived one of its most serious crises.18

18 T. H. Kearney, "Pure Pima Seed for 1927," Arizona Producer, August 1, 1926, p. 6, and Harry A. Stewart, "Sufficient Pima Seed to Plant 30,000 to 40,000 Acres," Arizona Producer, December 15, 1926, p. 6. The Litchfield ranch Pima plantings in 1926 totalled 1,858 acres: 680 acres in 1918 seed, 698 acres in 1920 seed, and 480 acres (for lint only) as a buffer crop planted with 1924 seed. All fields were rogued and inspected in July. The fields planted to 1918 and 1920 seed were found free from contamination whereas 747 off-type plants were pulled from the field planted with 1924 seed. Inspections were made by Harry A. Stewart, county agent; J. B. Duerson, assistant county agent; Prof. W. E. Bryan and F.L. Smith of the University of Arizona, and the following from Sacaton field station: G.O. Belden, F.M. Eaton H. J. Fulton, G.J. Harrison, C.J. King, H. F. Loomis, R.H. Peebles, and L. Towle.
Seed for the 1928 crop was also produced at the Litchfield ranch by the Southwest Cotton Company under similar roguing and inspection, using the 1918 and 1920 Pima seed "which made it absolutely pure and free from any admixture." The bulk of the seed for the 1927 and 1928 crops was sold through the Tempe Cotton Exchange under provisions approved by the pure seed association.

By 1930, ninety per cent of the Pima cotton crop was certified by the Maricopa county seed association, indicating seed purity was well protected.

The Salt River Valley planted 62,400 acres in Pima in 1929 (82,700 in upland). Pima county grew 3,200 acres and Pinal county 1,400 acres, bringing Arizona's total extra-long staple cotton plantings to 67,000 for the year. The Pima industry, in 1924 down to 8,000 acres and seed purity threatened, was within five years, that is by 1929, again comparatively well established. Growers' associations have continued to give seed purity first

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consideration. The Arizona Cotton Planting Seed Distributors, organized in 1949, is now well established and rendering cotton growers excellent seed stocks.

Sacaton, for fifty years the center of extra-long staple cotton, was abandoned in 1956 in favor of a new and modern research center. The new pure seed association in 1954 bought 275 acres of land between Phoenix and Tempe (on Broadway between 40th and 48th streets) and donated the site, except for ten acres, to the University of Arizona for use as a cotton research center, formally opened at a

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21 Numerous surveys to determine the relative merits of upland varieties as opposed to Pima cotton were made in Maricopa county from 1922 to 1930. The University of Arizona extension service prepared comparative acreage and returns in 1923 and 1924 (UA Timely Hints Nos. 145 and 150). Three comprehensive surveys were completed (1) by T. H. Kearney for the years 1922-1926; (2) by a committee of fourteen representing all phases of the industry of which Harry A. Stewart was secretary as part of a complete appraisal of the agricultural resources of the Salt River Valley, and (3) by C. J. King and H. F. Loomis of the Sacaton field station, covering the years from 1924 to 1930, inclusive. All of these surveys reached the same conclusion: the Pima cotton grower received the higher cash returns from his plantings than the upland grower in all years except 1922 and 1923. The name of Maricopa County Farm Bureau Pure Seed Association was changed to Arizona Pure Seed Association in 1933 and Kenneth R. McMicken succeeded Walter R. Strong, president since 1925. Harry Stewart continued as secretary until 1936. In 1937 the association was consolidated with Arizona Crop Improvement Association with R. L. Matlock, University of Arizona agronomist, as secretary.
dedication program on December 6, 1956. The new center has continued the research activities which had been concentrated at Sacaton since 1907. Facilities include laboratory and equipment, valued at $50,000, originally used at Sacaton, a field gin, machine shop, storage sheds, offices, and superintendent's residence. The cooperative is

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22 Arizona Cotton Planting Seed Distributors paid $168,864 for the Broadway land and at the time of the dedication reported total expenditures for the center by the cooperative at $205,000. The Arizona legislature appropriated $132,000 for the necessary buildings, and the cooperative supplemented this with $32,000 to finish a building to provide a meeting place and library. Both the distributors and Arizona Cotton Growers' Association maintain offices at the center on the ten-acre reserved plot. The distributors have given unstinted support to the extra-long staple seed programs. In 1952, McMicken announced that distributors had 1,300 acres devoted to Pima 32 seed development; 100 acres of parent stock, 400 acres of foundation, and 800 acres of registered stock. At the same time plans for speeding up supplies of Pima S-1 seed were revealed, which brought this high-yielding variety into production a year earlier than normally possible. Foundation seed of Pima S-1 was taken to Iguala, Mexico, a tropical area in which United States cotton interests have an experimental farm, and here the foundation stock was developed during the 1950-51 winter and brought to Arizona in time for distribution to growers of certified seed. This program enabled most of the 1954 crop to be planted to Pima S-1 and put new vitality into the extra-long staple industry. (V.R. Cardozer, Growing Cotton, published by McGraw-Hill in 1957, p. 53, has a picture of R. H. Peebles, Sacaton scientist, inspecting Pima S-1 experimental plants at Iguala.) The distributors have financed numerous research fellowships. The 1958 budget included $14,778 for research to the University of Arizona and $9,984 to USDA. The distributors financed a cotton mill and laboratory tour undertaken by Dr. Carl Feaster and Dr. Warner D. Fisher, cotton breeders at the center, in which special attention was given treatment of Pima S-1 at the mills.
the source of extra-long staple cotton seed not only for Arizona growers but the Pima-growing areas of New Mexico and Texas, also. 23

Breeding extra-long staple cotton is a continuing process both by the United States Department of Agriculture at the Phoenix cotton center and the University of Arizona on its experiment farms. The Arizona Cotton Planting Seed Distributors are equipped to develop the breeder seed under conditions that protect the seed purity. After fifty years of experience gained at Sacaton station, aided by growers who have maintained production through hazards attending production in multiple-variety areas, Pima cotton still survives as an important cash crop for the Southwest.

23Kenneth B. McMicken was one of the original incorporators and president of the seed distributors until his death in April 1959. Other incorporating directors were Dan W. Clarke, H. S. Miller, Cecil Collerette, J. Clyde Wilson, J. D. Lee, and Elwood H. Smith. Ed S. McSweeney, secretary of the Arizona Cotton Growers' Association, managed the new organization the first year and was succeeded by Wilbur Wuertz, Maricopa county agricultural agent, who served until 1956 when he became a Pinal county cotton grower. Since November 1956, Robert Shuler, previously at Sacaton, has been the manager. An advisory board, made up of representatives of federal and state departments of agriculture, University of Arizona Experiment Station, Arizona Farm Bureau, and the ginning industry, assists the board in dealing with cotton problems. The association has kept Doctor Bryan on full-pay status at the University by paying the difference gap he received under retirement.
The Pima cotton industry can be no more successful than the quality of its seed. Preservation of characteristics instilled under a breeding program can be lost in a few years unless protected. The Arizona Cotton Planting Seed Distributors now adequately serves the Pima cotton industry of the Southwest.
CHAPTER XII

STABILIZATION OF PIMA COTTON INDUSTRY

Maricopa County (Salt River Valley) has produced half (714,282 bales) of all Pima cotton grown in the United States (1,416,128 bales) since the crop was introduced commercially in 1912 up to and including 1958. Over this period, Arizona production (1,039,985 bales) has been almost three-fourths (73.5 per cent) of the nation's total American-Egyptian cotton crop.

Production in all other states, 1912-1958, and the portion of the total volume of all Pima cotton grown in the United States has been: Texas, 227,400 bales (16 per cent), New Mexico, 128,100 (9 per cent), and California, 21,543 bales (1.5 per cent).

Only Arizona growers have maintained continuous production since 1912. Most of California's production (17,743 bales) was grown prior to 1922, thereafter no Pima cotton was produced in that state until 1950. Only since 1940 has extra-long staple been grown in Texas and New Mexico.

From 1912 to 1937, the span of the first twenty-five years of the Pima cotton industry, Arizona produced ninety-seven per cent of the total Pima crop and California the remainder. Maricopa County grew 96.5 per cent (509,820 bales)
of all Arizona Pima cotton production (528,300 bales) in this twenty-five year period. Other counties produced the following amounts: Pinal, 12080 bales; Pima 6,050 bales; Yuma, 350 bales.\(^1\)

Since 1912 Maricopa County was the foremost producer of Pima cotton except for a period of ten years when other counties of Arizona produced a larger volume. During the years 1940-1943, when national defense needs called for larger crops of Pima cotton, Pinal county grew 77,770 bales, 30,000 bales more than Pima cotton crops of Maricopa county (47,450) in these four years. During 1944-1949, Graham County produced seventy-six per cent (13,710 bales) of all Pima cotton grown in Arizona (18,008 bales).

In 1947 the Salt River Valley (Maricopa county) grew twelve bales of Pima cotton, Pinal county harvested nine bales, Pima county two bales, and aside from Graham county which produced 140 bales, no other Pima cotton was grown in Arizona. The State's total yield of 163 bales prompted prediction of the extinction of the industry.\(^2\)

\(^1\)USDA Agricultural Marketing Service, Phoenix, Arizona, supplied data for Arizona production. However, the break-down by counties was not complete prior to 1930 except for Maricopa County. Bale production for Pinal, Pima and Yuma counties were reached arbitrarily by estimating lint yield at 200 pounds and multiplying by known acreage.

\(^2\)UA Arizona Agriculture, 1947 (Arizona Experiment Station Bulletin 206, February 1947), p. 10: "American-Egyptian cotton has ceased to be an important crop in Arizona." The 56th Annual Report (UA College of Agriculture), p. 17: "The chapter covering thirty years when American_Egyptian cotton was an important crop is now ended."
In the 1950's revival, Maricopa County regained its leading position in Pima cotton production and Graham County has replaced Pinal in second place in volume.

**Stability of the 1950 Decade**

Based on production and cash return to growers since 1950, the Pima cotton industry has enjoyed its most consistent period of stability. In Arizona, production has totalled 276,060 bales for the nine years, 1950-1958. For this crop, growers have received $95,824,000.³

Cotton growers of the Mesilla valley in New Mexico and the Trans-Pecos region of Texas planted Pima cotton because the extra-long staple variety had greater tolerance for verticillium wilt than the uplands grown in the same area. The speculative possibility that Pima cotton would be in special demand at high prices due to the war threats of 1939 and 1940 was also a consideration. New Mexico growers planted 100 acres in 1939 and up to 1952 had produced 69,300 bales, receiving a total of $23,149,000. Texas growers planted their first crop, 1,300 acres in 1940, and up to 1952 harvested 110,700 bales of Pima cotton, valued at $43,334,000.

During the period, 1939-1952, about which statistical data is available for New Mexico and Texas plantings, per

³USDA Agricultural Marketing Service, Phoenix, Arizona.
bale cash return for these states has far surpassed that of Arizona growers. Texas is first with $391 per bale; New Mexico, second, with $334 per bale; and the Arizona bale return for the same period was only $273. The higher returns for the newer areas is due to the better grade of product marketed. This is evident in a report of the 1952 Pima cotton harvest in which only 9.8 per cent of Arizona's crop graded No. 1 whereas 42.2 per cent of New Mexico's and 45.4 per cent of Texas' harvest were marketed in the highest grade.

The stability of the Pima cotton industry since 1950, if such it can be called, is tenuous in that production and marketing has been dependent on inconstant factors beyond control. For many years, American-Egyptian cotton was planted by growers only to use cotton lands taken out of production by upland acreage allotments. This position accounted, to a large degree, for the increase of Pima cotton plantings in Arizona, New Mexico, and Texas from the low 5,700 acres in 1949 to the high 104,600 acres in 1950.

The military stockpile purchase program of 1951 and 1952 absorbed most of the Pima cotton harvests in these years, and the Commodity Credit Corporation loans took the bulk of the 1953 and 1954 crops.

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5 Arizona Farmer, May 9, 1953, p. 8.
The 1955 Soviet-Egyptian arms deal and the 1956 French-British-Israeli attack on the Suez Canal resulted in American mills using more Pima cotton than extra-long imports in 1956 and 1957. More than 110,000 bales of Pima cotton were exported in the years 1955-1958. These two events had never happened before in the history of the Pima cotton industry.

American spinning mills base consideration of Pima cotton purchases on (1) supply, (2) quality, and (3) price. Short supply occurred in 1924 when Arizona growers produced only 4,374 bales of Pima cotton, and from 1944 to 1949 when the industry was near extinction. These were years when mills asked the Tariff Commission to authorize supplementary imports from foreign sources. Other years, when the domestic price was above that of similar cotton in the world market, mills made their purchases in the most favorable price market. An executive of Coats & Clark, Inc., one of the nation's largest users of extra-long staple cotton, expressed this view on the price situation in 1957:

With the support price the past few years for Pima cotton as high as it was and is, it made it prohibitive to buy any sizeable amount of this American growth.

As a typical example, this year (1957) it has been possible to buy certain Egyptian cottons at thirteen to fourteen cents a pound below comparable grades and staples of Pima S-1...
It is hoped that the Pima crop can be built up in sufficient quantity to meet the demands of the American spinners and at the same time sell it at the world market price regardless of what that may be.7

The spokesman for Coats & Clark evinced a great desire to use Pima cotton exclusively for certain phases of their work "providing everything is equal," asserting "it would be a great assistance to us to buy cotton around the calendar instead of having a quota constantly over our heads".8

Percy Howe, president of the American Thread Company, told extra-long staple growers at the 1955 convention of the National Cotton Council that users would rather use the domestic than the imported product.9

Pima cotton growers have proven since 1950 that they are capable of growing an adequate supply of prime quality extra-long staple stock, fulfilling two of the requisites of the domestic market (supply and quality), but have found

7F. H. Field, vice president of Coats & Clark, Inc., in letter to writer dated December 16, 1957. Fields cited that over the years his company has run many tests and used sizeable quantities of the old Pima, Amsak, Pima 32 and the current growth of Bryan's Pima S-1. He wrote: "The price for American-Egyptian cotton in the past has been quite unstable. As an example, a few years ago I endeavored to purchase 5,000 bales of Pima 32. The price started at sixty-three cents a pound and by the time 1,700 bales had been secured the price had risen to eighty-seven cents which meant that the balance of our requirements had to be covered by Egyptian cotton."

8Ibid.

price stabilization beyond their powers. Egyptian Karnak, for example, sold within four cents a pound of Mexican cotton at the beginning of 1959 whereas it was 39 cents higher in 1956-57 and 16 cents higher in 1957-58. In January 1957, Egyptian Karnak was priced at 81.98 cents per pound on the Liverpool market at the same time Pima cotton sold at Phoenix for 65.85. In January 1959, Karnak was 34.02 cents and Pima 58.10 cents on these same markets.¹⁰

In short, Pima cotton has been caught in a price squeeze manipulation involving the United Arab Republic. The Nasser regime, in control of that nation's economy, has made possible a flexibility in prices for export by frequent changes in regulations affecting foreign exchange. From time to time premiums up to twenty-five percent or more have been granted for payment in desired currencies. Varying percentages of the foreign currency

¹⁰International Cotton Advisory Committee, Report on Extra-Long Staple Cotton (Doc. 14, XVIII, Washington: May 1959), p. 31. President J. Clyde Wilson told the 1959 convention of the SuPima Association how hopeless price control was: "Regardless of where domestic cotton is priced, the Egyptians cut just far enough under to get the business. This is purely political competition and has nothing to do with costs of production or other expenses. Colonel Nasser, the Egyptian dictator, must have American dollars to shore up his country's shaky economy. So cotton is sold to exports at the equivalent of eighty cents a pound in Egyptian money. The exporters sell in America for what they can get, take their dollars home, trade them on the black market for Egyptian pounds, settle with their government and make a profit." Arizona Farmer, March 14, 1959, p. 30.
involved are sometimes permitted to be withheld under agreements which do not require that all proceeds be turned into the exchange authorities. In addition, there have been barter transactions in which certain goods are exchanged for cotton. Such deals have been made with France, the United Kingdom and other countries.\textsuperscript{11}

\textbf{SuPima Proposed Solution: Lower Import Quota}

With diminishing hope of making Pima cotton competitive on a strictly price basis, SuPima officials believe stabilization can come only when growers of the Southwest can have an assured portion of the home market each year at prices commensurate with the cost of production. This can be attained by reducing the volume of foreign extra-long staple cotton now permitted entry under the import quota system, now approximating 80,000 bales annually.\textsuperscript{12}

Import quotas on cotton, as originally adopted in

\textsuperscript{11}Ibid., p. 31

\textsuperscript{12}The USDA has consistently supported this theory and asked the Tariff Commission to reduce extra-long staple imports by 52.2 per cent at a hearing before the Tariff Commission held on April 28, 1959. The State Department opposed the reduction and by a three-to-two vote, the commission rejected the reduction proposal. The import quota as now in effect allows approximately 80,000 bales extra-long staple cotton entry annually. The USDA proposal would have reduced the volume to 39,826 bales a year. Although the Tariff Commission refused to make any reduction recommendation to the President, the USDA insists the matter is under constant review and will be presented at a suitable time in the future.
1939, included both ordinary and extra-long staple with no distinction as to what volume was permitted each variety. The first quota assignment allotted 95.2 per cent of the total to Egyptian cotton and 4.5 per cent to Peruvian. In July 1942 these country quotas were replaced by a global quota of the same volume.

Not until July 7, 1958, were quotas subdivided: 79,181 bales, extra-long staple; 12,131 ordinary long-staple; and 3,000 Peruvian Tanquis. Three supplemental quotas were authorized at the request of American mills (June 14, 1947; July 20, 1948, and October 20, 1950), authorizing 97,188 bales above quotas to be imported. This was the period when the domestic Pima had its lowest production.

In the stockpiling program of 1951 and 1952, the United States bought 65,000 bales of foreign cotton entered under the import quota and 117,600 bales of foreign cotton never applied to any quota.

The Agricultural Adjustment Act of 1938 authorized the President of the United States to impose cotton import

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13U.S. Tariff Commission (July 1959), *op. cit.*, table 1b, p. 44. The change came after Mexican long-staple used most (49,108 bales) of the 1957-58 import quota, holding Egyptian imports to 28,665, and Peruvian to 13,540 bales.

14Rafler, *op. cit.*, p. 35.

15Ibid., p. 12
quotas whenever it was found that the domestic program was being interfered with by imports. Fifteen months after the first import quota was established, the quota was suspended on cotton stapling 1-11/16 inches or longer. Proposed as a defense measure the suspension remained in effect until May 28, 1956, and in the interim, thousands of bales of extra-long staple came into the United States over and above the established quota.  

The volume of extra-long staple cotton which came into the United States under preferential treatment accorded to cotton stapling 1-11/16 inches and over has never been recorded, except for the period from September 20 to December 31, 1947, when the Tariff Commission found 20,000 bales had entered quota-free in less than four months. A further indication of large Peruvian imports (Peruvian Pima is longer than either Egyptian or American-Egyptian extra-long staple) was the increase from only 3,200 bales.

16U. S. Tariff Commission (Report 161), p. 22. Commissioner Edgar B. Brossard, in a minority opinion, granting mills a supplemental extra-long staple cotton quota in 1948, said of the exemption of staples of 1-11/16 and over: "It is high time that this defense-era expedient . . . be reconsidered since the occasion . . . has ceased to exist."


18U. S. Tariff Commission July 1959, op. cit., p. 25. wrote: "Pima cotton grown in Peru is generally longer than the Egyptian or American-Egyptian extra-long staple cottons. It is, however, less strong and for that reason less suitable for manufacture of sewing thread. It is used in the production of fine shirtings and dress goods because it takes a beautiful luster when mercerized."
during 1930-39 to 204,000 bales the following decade, 1940-49.\textsuperscript{19} In 1940-49, only 70,648 bales of Peruvian cotton imports were charged against the quota.\textsuperscript{20}

The mill requests for supplemental imports all came during the period when the domestic Pima cotton crop was in its lowest period of production, 1944-49. The complete elimination of imports was asked but no such action was taken.\textsuperscript{21}

The viewpoint of the Pima cotton industry was covered in a minority report prepared by Commissioner Edgar B. Brossard following the 1948 Tariff Commission hearing. He pointed out that the original import of approximately 95,000 bales was excessive because it was based on two years of the preceding decade when imports were largest.


\textsuperscript{20}U. S. Tariff Commission (July 1959), \textit{op. cit.}, table 1b, p. 44.

\textsuperscript{21}Dr. George W. Barr of the University of Arizona Department of Agricultural Economics appeared at the 1947 and 1948 hearings to represent Arizona Pima cotton growers. Prior to the 1950 National Cotton Council Convention, a day-long conference of growers (Cecil Collerete and Keith Taylor of Arizona, Jake Sweet of New Mexico, and Robert Hoover of El Paso) was held with mill men (John Clark of Clark & Coats, Percy Howe of American Thread, and R. S. Dickson of American Yarn & Processing Company.). R. H. Peebles of Sacaton was present as advisor. The growers agreed to approve larger imports of Egyptian cotton after threats of a swing to synthetics. Growers were told when and if the Southwest is able to fill needs, the mills may be customers. (\textit{Farmer}, February 18, 1950, p. 5).
(Since the quotas were not filled in the first six years, this statement seemed well-founded). Furthermore, removal of cotton stapling 1-11/16 inches and over from quota restriction increased the original quota by several million pounds. The reduction of the tariff from seven cents to 3.5 cents further favored foreign imports.

The net and accumulative effects of these acts brought on the price decline of the late 1940's which discouraged the production of domestic extra-long staple cottons. Unless the domestic industry was revived, Brossard warned, "it might be disastrous in war-time for the United States to be dependent for its supplies of this strategic and critical cotton on Egypt. . ." 23

With the domestic crop in low supply in 1947-48, Egyptian cotton was selling as high as $1.02 a pound. Mills were feeling the price squeeze from abroad and were looking to domestic growers for supplies. In March 1948, W. K. Shaw, Jr., of the E. A. Shaw & Company of Boston, wired his Phoenix office that he had several inquiries from New England and Southern mills as to whether the Pima


SXP would be available in the coming year. Brossard stated, as his opinion, that taxes added to Egyptian stocks would bring the delivered price to United States mills even higher under the extra-long staple monopoly enjoyed by the Egyptian government:

There are large stocks of extra-long staple cotton in Egypt, but most of these stocks are owned and controlled by the Egyptian government. In other words, at present there is practically an Egyptian government monopoly of extra-long staple cotton. The monopoly controls sales and charges prices at "what the traffic will bear." At this very moment the prices of Egyptian extra-long staple cotton are about $1 a pound in Egypt. In addition the government recently (April 12, 1948) imposed an export tax... would make the price $1.10 a pound delivered in the United States. This is a fair demonstration of what may confront the United States when domestic production of extra-long staple cotton is destroyed and domestic mills become dependent on a supply of the Egyptian government.25

The Supima Association bases its case for import quota reduction on the same premise and, with the support of the United States Department of Agriculture, is asking as a means to stabilization to provide a set portion of domestic needs. Mill operators have been advised that


if allotments are forced below 65,000 acres, roller gins will go out of business "and the already tiny industry will fade away."26

Growers maintaining Pima cotton enthusiasm in Arizona during the 1930's were the "Cotton Kings" selected in competition during the years 1932-1939, except for 1936. The University of Arizona extension service, under the direction of Howard N. Waterpaugh, sponsored the Pima Cotton High-Yield Club from which the "kings" were chosen on the basis of yield of Pima cotton. The winners were:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>COTTON KING</th>
<th>LINT POUNDS PER ACRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1932</td>
<td>Walter L. Smith</td>
<td>379</td>
</tr>
<tr>
<td>1933</td>
<td>Dr. T. S. Bishop</td>
<td>510</td>
</tr>
<tr>
<td>1934</td>
<td>Tim Malone</td>
<td>553.7</td>
</tr>
<tr>
<td>1935</td>
<td>Don Smith</td>
<td>485</td>
</tr>
<tr>
<td>1937</td>
<td>Blanton Dick</td>
<td>573 (SXP)</td>
</tr>
<tr>
<td>1938</td>
<td>H. S. Miller</td>
<td>573</td>
</tr>
<tr>
<td>1939</td>
<td>Sam Joy</td>
<td>728</td>
</tr>
</tbody>
</table>

26Arizona Farmer, April 9, 1960, p. 57. J. Clyde Wilson of Buckeye, Arizona, who retired as Supima president in 1959, testified at the April 1959 Tariff Commission hearing that the 1958 Pima cotton crop of Arizona was valued at $12,000,000 and the investment of roller gins used only for Pima cotton was $5,000,000. Wilson cited the plight of Graham county's Safford Valley if crop allotments of 1958 had been reduced to the minimum as appeared probably then: Six thousand of the 12,000 population look to the Pima cotton industry for livelihood. The proposed quota reduction would mean an economic loss of $2,407,133 to Safford Valley alone.
EGYPTIAN COTTON GROWN IN 1901 BY DR. A. J. CHANDLER


FIELD OF PIMA S-1 GROWN ON UNIVERSITY FARM, TUCSON, IN 1955.

Appearing here as contrast to the first field of Egyptian cotton grown in Arizona by Dr. A. J. Chandler (top above) is the field of Pima S-1 as it appeared at the University of Arizona Experiment Farm in northwest Tucson. The lower picture (with William Hall, foreman standing in the field) shows what breeding has accomplished.
CHAPTER XIII

SUMMARY AND REVIEW

The American-Egyptian Pima extra-long staple cotton came into existence because of the demand by manufacturers at the turn of the century that the United States Department of Agriculture develop a cotton product competitive in price and quality with Egyptian cotton. The cotton grown on the Nile around 1900 was coming into the United States at a rate exceeding 100,000 bales every year and increasing in volume and popularity with American spinners. Since the United States grew more cotton of all kinds than the rest of the world combined (three times as much in 1891), the increasing dependence on Egyptian cotton for supplies of a high-quality, high tensile strength variety was a matter of concern to the domestic industry.

In 1900 Egyptian extra-long staple cotton was rated between the American Sea Island and upland shorter-staple varieties in terms of staple length and price. Manufacturers in the United States preferred the imported variety because it was found adaptable to mercerizing and under processing it attained a high finish resembling silk. The Nile product had clearness, luster and a capacity for taking dyes, which permitted it to be mixed with silk, sateen,
India linens, and goods with a brilliant surface. Egyptian cotton was used in sewing thread, fabrics for insulation, bicycle and automobile tires, mail bags, high pressure hose, and similar articles requiring high tensile strength. The Sea Island variety supplied these qualities also but it was in high export demand and more costly than the Egyptian cotton.

Repeated attempts, starting as early as 1867, to grow Egyptian cotton in the normal cotton belt of the South had failed, primarily because of the shortness of the growing season. The United States Department of Agriculture found that weather, water, and soil conditions of the delta of the Nile river were more nearly duplicated in the area near the mouth of the Colorado river in the American Southwest. Accordingly, serious research and experiment was concentrated in the Yuma, Arizona, region starting in 1902.

Some Egyptian seed, received from an 1899 expedition made by David Fairchild and Barbour Lathrop, had been planted in Arizona by Dr. A. J. Chandler on his Mesa ranch and at the territorial experiment farm at Phoenix by Pros. A. J. McClatchie in 1901. These plantings proved that Egyptian varieties could mature in the drier and hotter irrigated areas (a season of longer growing in the Southwest). Rank vegetation and numerous other impediments precluded any commercial use of these early experimental plantings.
It remained for Dr. Thomas H. Kearney and a dedicated group of scientists of the United States Department of Agriculture to bring an American variety of Egyptian-type cotton into commercial use for the first time in 1912.

The new American-Egyptian variety was scarcely in production but a few years when the folly of complete dependence on a foreign power for the raw materials needed by American industry was proven.

World War I, declared in 1914, had by 1916 restricted the amount of Egyptian cotton which could be imported. The domestic supply of Sea Island cotton was curtailed in this same period by the boll weevil and a deterioration of its quality by hybridization due to proximity to short-staple varieties, and by 1919 production was down to less than 7,000 bales. The spinning industry found itself desperately in need of raw cotton of the extra-long staple strength to keep in production. This applied particularly to the rubber and tire industry.

In 1916 Goodyear Tire & Rubber company sent Paul W. Litchfield to Arizona to investigate the new American-Egyptian cotton just aborning. He tried to stimulate production by offering ranchers a guaranteed price but failed to secure an adequate volume. T. E. McDevitt of Yuma agreed to grow cotton for Goodyear but advised by a Pasadena lawyer, E. F. Parker, that he would not make a million dollars and might lose everything he had, the
contract was voided and in desperation was taken over by Goodyear.

The company bought 24,000 acres of Arizona desert land and grew its own cotton. Subsequent events provided a saga of "big-business" methods applied to cotton growing; the employment of the top talent in construction, engineering, water development, and the setting off of a "long-staple cotton craze" that drove alfalfa growing and dairying into the background, while growers enjoyed prosperity from the high-priced Pima cotton crops of 1917-19. In 1920, more land (243,000 acres) was planted to Pima cotton than has ever occurred since. Between planting and harvesting time, extra-long staple prices dropped from $1.00 a pound and more to twenty cents a pound, and part of the 92,000-bale bumper crop remained unsold for several years.

The scientists of the Department of Agriculture who had developed Yuma, the first variety of Pima cotton, through ten years of acclimitization and breeding at Yuma and Sacaton laid down as a fundamental of the industry's success that all other varieties must be excluded from the planting region. The Salt River Valley had been selected as a one-variety community and was so maintained until 1922. High upland prices the next year almost drove the Pima cotton industry out in 1924 when 122,000 acres were planted to the short staple and only 8,000 to extra-long staple. This destroyed the one-variety plan and threatened Pima cotton
quality because of mixture of varieties.

By 1927 the Pima industry had passed the severe crisis through the use of seed which had been sealed from crops when only extra-long-staple cotton was grown in the Salt River Valley. That the industry survived is due to the agriculturists of the United States field station at Sacaton, and the College of Agriculture of the University of Arizona, the Southwest cotton Company, the Maricopa County and Arizona pure seed associations, and more recently the Arizona Cotton Planting Seed Distributors, Arizona Cotton Growers' Association, the SuPima Association of America, and the National Cotton Council. The names of Kearney, Peebles, and Bryan will be forever enshrined in the hearts of Pima cotton growers because of the constant improvement of varieties produced over the years.

In some ways, Pima cotton has been treated as the step-child of the fiber industry. Up until World War II when the logistics of war called for greater production from Pima growers, the extra-long staple cotton had been excluded from loan benefits given upland varieties by "new-deal" legislation. In these years Pima came to favor for acres taken out of production by short-staple control. This provided an effective cushion for growers not permitted to employ their land for upland crops. Not until 1952 was legislation passed giving Pima growers support prices as well as acreage control. This became effective in 1954.
Tariff and import quotas, imposed respectively in 1930 and 1939, were intended primarily to promote the extra-long staple industry. In both instances, however, ordinary long-staple, always in surplus and in export, was lumped with the extra-long staple, minimizing the good these acts proposed. The seven-cent tariff of 1930 was reduced by half in 1942 and to one-fourth on cotton stapling 1-11/16 inches. What benefit to the Pima cotton industry accrued by the tariff was watered down in these reductions of import duties.

Likewise, the import quota had wide loopholes which reacted against the Pima cotton trade. Within fifteen months after the original quota was established, cotton with a staple 1-11/16 inches and over was admitted quota-free. This opened the gates to large unknown volumes of foreign extra-long staple cottons. The original quota, as charged by a member of the tariff commission, was based high originally and since the quotas remained unfilled the first six years, this charge appears supported. When Pima cotton was on the verge of extinction, mills asked for and received supplemental quotas in three years (1947, 1948, 1950). Egyptian cotton sold for over $1 a pound in some of these years.

Pima cotton production has become sufficiently ample to care for domestic needs due to the high-yield Pima S-1. From 1955 to 1958, the price has been competitive due to price-support reductions and the merchandising campaign of the SuPima Association after 1954. Prices of Egyptian cotton
(largely controlled by the government through currency manipulation) after 1957 dipped to extreme lows. As a consequence, domestic mill consumption of Pima cotton (higher in 1956-57 and 1957-58 than Egyptian cotton) is again suffering from the competition of foreign imports on a price basis. (The 1958-59 prices of comparative grades: Pima at Phoenix, 58.14 cents a pound; Karnak at Liverpool, 35.70 cents a pound).

Currently, the SuPima Association believes the American extra-long staple cotton industry must have a protected market to survive. With the support of the federal Department of Agriculture, the Tariff Commission was asked to recommend to the president that import quotas be reduced 52.2 per cent, permitting Southwest Pima cotton growers to supply a larger portion of domestic needs. The State Department has opposed the reduction. The Tariff Commission, after a hearing held in April 1959, by a three-to-two vote decided against the growers. The Department of Agriculture is convinced of the justice of the growers' plea and has assured officers of the SuPima Association that the question will be reopened.

The SuPima Association has the support of the National Cotton Council in forming a long-term program with stabilization of the industry an objective. This includes a floor of 65,000 acres (1960 allotment 64,776 acres) for Pima cotton.

The association and the American Cotton Manufacturers Institute have jointly financed for 1960 a study of extra-long
staple cotton potential in the market. This study is being made by Dr. Thomas Stanback of New York University.

Several Washington conferences revealed that knowledge of end uses and reliable figures on consumption are incomplete. Annual consumption has approximated 110,000 bales but since the import-quota-free cotton of 1-11/16 inches and over may not have been included in statistics and has been cut off since May, 1956, the belief prevails that there is a market of 150,000 bales annually open to Pima and imported cottons.

The SuPima merchandising campaign has opened many new outlets since 1954, also. The current study is expected to reveal a basis for normal expansion of the domestic industry in coming years without dependence on government price supports.

After almost fifty years of research and production, starting at Yuma in 1902, the Pima cotton industry is capable of growing all the extra-long staple cotton required by mills in the United States. Growers are organized to produce quantities required. The Pima S-1, in production since 1954, is admittedly the best domestic extra-long staple ever grown and its high acreage yield makes it a profitable crop for growers. Most mills concede Pima S-1 high quality but are influenced by price in their purchases. They have long used Egyptian cotton, know its qualities, and will buy the foreign product when the market is attractive.

The Pima industry survived despite the seed crisis of
1924-27, and the near-extinction following World War II. The immediate problems seem acute, too.

However, an awareness of the importance of a domestic extra-long staple cotton industry seems well imbedded, except perhaps with the State Department. Mills must recognize that they would pay dearly for extra-long imports if no domestic source was available. They profit by keeping foreign and domestic industries in competition and insist that the domestic variety is wanted—but not at prices much beyond those of imports.

The business-like approach to industry problems by the SuPima Association augurs well for the future of the Pima cotton industry. What to do with the 230,000 bales of extra-long staple (mostly foreign cotton) remaining in the military stockpile and declared non-essential in 1957 remains a problem. Its existence is symbolic of the role and importance Pima cotton has played in national defense and may in the future.

As to Arizona, Pima cotton was the harbinger of the state's present national standing in the fiber industry. Since 1947, cotton has been Arizona's foremost agricultural crop. (The 1956 crop was valued at $165,000,000; livestock in second place was $74,000,000). The state ranks fifth among all states in volume of production (behind Texas, Mississippi, Mississippi,

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1 Arizona Agriculture 1957 (UA College of Agriculture Bulletin 281), p. 5. The 1959 cotton crop was valued at $150,000,000; livestock, in second place, $97,000,000.
Arkansas, and California). In 1953, cotton production in Arizona went over a million bales (most was produced in Maricopa County, 448,770 bales, and Pinal, 370,000 bales).\(^2\)

In six successive years, 1949-54, the acre-yield of cotton in Arizona topped every cotton-growing state in the union.\(^3\)

The pioneers who braved the heat and the winds of the desert at the start of the twentieth century built well.

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\(^3\) *Arizona Agriculture* 1955 (UA College of Agriculture Bulletin 261), p. 6.
GLOSSARY OF COTTON TERMS

Acala Cotton: A variety of cotton introduced into this country from Mexico. The staple length is 1-1/16 inches or better.

American-Egyptian Cotton: Cotton grown in the irrigated sections of the Southwest. Developed from Egyptian seed. Of high grade and having a staple length of 1½ to 1-5/8 inches.

Arizona Cotton: Cotton grown in Arizona, principally American-Egyptian types.

Carding: One of the most important processes in yarn manufacturing. It removes most of the impurities and a certain amount of short, broken or immature fibers.

Card Waste: The short fibrous material removed as waste in the operation of a card.

Combed Yarns: Cotton yarns that have been carded and combed. They are cleaner, smoother, and more lustrous and more expensive than carded yarns. Combed yarns are usually made in the finer counts.

Compress: A cotton warehouse having high-powered presses (compresses) much like a gin press for compressing the ordinary gin bale, making it dense and more compact to save space in shipping.

Converter: The term applied to a man or a firm which buys cotton, rayon, or silk goods and sells them in the finished state.

Cotton Grade: A measure of the color, foreign matter present, and the preparation of a given lot of raw cotton.

Cottonseed: Seed of the cotton plant, constituting about two-thirds of the weight of unginned cotton, and separated from the lint during ginning.

Cottonseed Hulls: The crushed outer covering of cottonseed removed at an oil mill. Used mainly for adding bulk to cattle rations.

Cottonseed Meal: A greenish-yellow powder obtained by grinding the cake after the oil has been expressed from cotton seed. It is rich in nitrogen and is used for feeding cattle, as a fertilizer, etc.

Cottonseed Oil: A valuable fixed oil expressed from the seeds of the cotton plant. It is a pale yellow, practically odorless and tasteless, oily liquid. Extensively used in the manufacture of margarine, hydrogenated fats, and cooking oil, etc.

Cotton Staple: The average length of fibers in a given cotton. It is not a mathematical average but is the length of a selected portion of the fibers which, although containing fibers of various lengths, by custom is assigned to a sample or bale as a whole. The staple of different kinds of cotton varies from less than one-half to more than two inches.

Delta: 1. The comparatively narrow strip of land in western Mississippi between the Yazoo and Mississippi Rivers. It is a very rich region, famous for the production of high quality cotton. 2. The triangular tract of land at the mouth of the Nile River roughly bounded by Alexandria, Cairo, and Port Said. It is the most important cotton growing region in Egypt.

Egyptian Cotton: Egypt is the world's largest producer of high grade, long staple cotton. The majority of it is grown in the Nile Delta and all requires irrigation. The staple length commonly runs from 1-1/8 to 1-1/2 inches, the fibers are quite fine and they have a distinct color—varying from light cream to dark tan. One troublesome problem with these cottons has been to maintain the quality of the better varieties.

Fabric: A collective term applied to cloth no matter how constructed or manufactured and regardless of the kind of fiber from which made.
Foreign Cotton: A term applied to all cotton grown outside the United States.

Foreign Matter: Extraneous material found in cotton; i.e. bits of leaf, boll, twig, seed, dirt, etc.

Gin: The machine used to separate cotton fibers from the seed.

Gin Bale: The low density bale of cotton made at a gin. Its average density is about twelve pounds per cubic foot, weight about 500 pounds, and dimensions about 27x54x45 inches. Also called flat bale, box bale, square bale.

Gin Cut: Cotton in which some of the fibers have been cut by the saws of the gin. This reduces the value of the cotton considerably as it increases the percent of short fibers present and the waste in processing. Often caused by ginning cotton that is not dry.

Ginning: Specif., the process of separating the lint cotton from the seed, but usually extended to cover other processes involved in turning out a gin bale.

Ginning Outturn: The amount of lint received after ginning a lot of cotton, expressed as per cent of the weight of seed cotton. It ranges from 20% to 50%, but averages about 35% for American cotton.

Grade: The quality of raw cotton judged on the basis of its color, dirt, content and preparation.

Green Cotton: Cotton which has been picked prior to maturity. This damp cotton is found chiefly at the beginning of the picking season.

Hull: The outer hard shell of cotton seeds.

Immature Cotton: Cotton that has been picked and baled before the fiber has reached a normal state of maturity, resulting in a weakened staple of inferior value.

Jumel's Tree Cotton: The first commercial cultivation of this plant around 1820 marked the beginning of Egypt's importance as a cotton growing country. It was being grown solely as a flower garden plant until at the suggestion of a French engineer--Jumel--it was
propagated and grown for its lint. The success of the venture led to the importation and trial of many other cottons.

Neps: Minute, tangled masses of cotton fibers.

Neppy Cotton: Cotton containing many neps or pin-head specks of tangled fiber.

Peruvian Cotton: Cotton has been grown and used in Peru since prehistoric times. Among the principal types: (1) Rough Peruvian . . . (2) Smooth Peruvian . . . (3) Tanquis . . . (4) Sea Island and American-Egyptian types are grown to a limited extent. All Peruvian cottons have good staple length, from one inch to 1½ inches, and since nearly all of the crop is exported it is an important growth in the world market.

Sea Island Cotton: A valuable species . . . having the world's longest staple, sometimes attaining a length of 2½ inches, but commonly about 1½ inches . . . grown in the West Indies, and was cultivated rather extensively in eastern South Carolina, Georgia and northwestern Florida and the islands adjacent to those states, until about 1920 when the boll weevil made its culture unprofitable.

Seed Cotton: Cotton before ginning and containing the seeds just as gathered.

Short Staple Cotton: In the United States any cotton having a staple length of less than 1-1/8 inches. In foreign countries other lengths are taken as a dividing line, e.g., 1 inch or 7/8 inch.

Snapped Cotton: Cotton gathered by hand by snapping the entire boll off the plant. Before ginning it must be run through an attachment to burst and remove the bolls.

Spinning: Collectively, all of the operations in manufacturing a yarn from fibrous raw material.

Type: As applied to cotton, this is a means of designating all the various characteristics desired in a cotton by a single sample.

Upland Cotton: The standard American cotton and the one with which other cottons are compared. . . . Name
originally applied to cotton grown in the upland sections of North Carolina, South Carolina and Georgia to distinguish it from coastal or Sea Island cotton. Now grown in practically all cotton growing regions of the United States and in many foreign countries. It ranges in staple length from 3/4 to 1¼ inches. Mostly about 1 inch.

Uppers: A term applied to cotton produced in the narrow upper valley of the Nile from Cairo south to Aswan. It is generally a shorter staple than that grown in the Delta . . .

Variety: A group of animals or plants related by descent, but distinguished from other similar groups only by characters considered too inconsistent or trivial to entitle it to recognition as a species.

Waste: Material removed, rejected, or otherwise lost in various manufacturing processes.

Western Area: The newest cotton producing section in this country including parts of southern California, Arizona and New Mexico. Irrigation is required and the cotton is of two types, American-Egyptian and upland.

Wilt: A fungus disease . . . that attacks cotton and many other plants . . . Affected plants are stunted, the leaves turn yellow and shed and often eventually die. The only effective control measure is the planting of wilt-resistant varieties that have been developed.
Material for Statistical Appendix, except Arizona production by counties on page 266, is reproduced from "Report on Extra-Long Staple Cotton" published by International Cotton Advisory Committee, Washington, D. C., in May 1959, together with a supplemental report (attachment I to SSX-N-I) carrying the report of the extra-long staple cotton situation to mid-August 1959. Tables, numbers and headings are left as appeared in original publication.
INTRODUCTION

Definition and importance. Cottons having a staple length of 1-3/8 inches (35 mm.) or over are defined as extra-long staples according to the classification used by the International Cotton Advisory Committee. These cottons comprise only about 6.5 percent of the production of cotton in the non-communist world (Table 1), but are highly important in the economies of the limited number of areas in which they are produced. The extra-long staple cottons also are an important raw material in the textile industries of several countries where they are made into cotton goods of the highest quality.

Table 1. Production of cotton in non-communist world by staple lengths, 1958-59

<table>
<thead>
<tr>
<th>Staple length</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Million bales</td>
</tr>
<tr>
<td>Extra-long, 1-3/8&quot; and longer</td>
<td>1.9</td>
</tr>
<tr>
<td>Long, 1-1/8&quot; and longer but less than 1-3/8&quot;</td>
<td>2.8</td>
</tr>
<tr>
<td>Medium, 3/4&quot; and longer but less than 1-1/8&quot;</td>
<td>23.6</td>
</tr>
<tr>
<td>Short, Under 3/4&quot;</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>29.3</td>
</tr>
</tbody>
</table>

Characteristics. Extra-long staple cottons are characterized not only by their length of fiber but also by fineness and high fiber strength which makes possible finer and stronger yarns that can be spun from shorter staples cottons, although the advantage in strength diminishes as the yarn becomes coarser. The inherent fiber strength of as high as 50 tons per square inch is higher than for any other cotton, which is important if strength is needed in the end product. The long staple length also makes possible textiles of smoother finish than can be made of other cottons. A tabulation of the varieties of extra-long staple cotton, with data on their characteristics and yields per acre, is given in Table 2. It will be noted that some cotton of the Lambert variety in the Sudan may fall below the lower limit for extra-long staples but is included in this group for convenience.

Growing conditions. Extra-long staple varieties, with the exception of Sea Island, are grown under irrigation. All require a relatively long growing season and, except in the U.S.S.R., are usually roller ginned, a much slower process than saw ginning which is used widely for medium staples.
Table 2. Characteristics, yields and production of extra-long staple cottons

<table>
<thead>
<tr>
<th>Country and variety</th>
<th>Staple length</th>
<th>Fineness</th>
<th>Tensile strength</th>
<th>Color</th>
<th>Yield per acre (Pounds)</th>
<th>Production (1,000 bales)</th>
<th>As percent of country’s total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aden X1730 A</td>
<td>1-11/32</td>
<td>2/</td>
<td>2/</td>
<td>2/</td>
<td>267</td>
<td>24</td>
<td>100</td>
</tr>
<tr>
<td>British West Indies</td>
<td>1-3/4 - 2</td>
<td>2.5 - 3.3</td>
<td>96 - 100</td>
<td>Creamy white</td>
<td>229</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Egypt (UAR)</td>
<td>1-7/16 - 1-1/2</td>
<td>2.9 - 4.0</td>
<td>95 - 100</td>
<td>Dark creamy white</td>
<td>333</td>
<td>439</td>
<td>23</td>
</tr>
<tr>
<td>Menoufi</td>
<td>1-5/16 - 1-7/16</td>
<td>3.0 - 4.0</td>
<td>95 - 100</td>
<td>Dark creamy</td>
<td>593</td>
<td>715</td>
<td>38</td>
</tr>
<tr>
<td>Israel</td>
<td>1-7/16 - 1-1/2</td>
<td>2.7 - 3.1</td>
<td>2/</td>
<td>2/</td>
<td>600</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Peru Pima 32</td>
<td>1-1/2 - 1-11/16</td>
<td>3.0 - 3.5</td>
<td>84 - 92</td>
<td>Creamy white to creamy brown</td>
<td>347</td>
<td>90</td>
<td>18</td>
</tr>
<tr>
<td>Kamak</td>
<td>1-3/8 - 1-1/2</td>
<td>3.5 - 4.0</td>
<td>98 - 105</td>
<td>Creamy white to creamy</td>
<td>346</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Sudan Domain Sakel</td>
<td>1-5/16 - 1-7/16</td>
<td>4.0</td>
<td>95 - 105</td>
<td>Creamy brown</td>
<td>166</td>
<td>165</td>
<td>75</td>
</tr>
<tr>
<td>Lambert</td>
<td>1-1/4 - 1-3/8</td>
<td>4.0 - 4.5</td>
<td>95 - 100</td>
<td>Darker creamy brown</td>
<td>346</td>
<td>432</td>
<td>1</td>
</tr>
<tr>
<td>United States Pima S-1</td>
<td>1-5/8 - 1-15/32</td>
<td>3.1 - 3.5</td>
<td>92 - 104</td>
<td>Creamy</td>
<td>485</td>
<td>82</td>
<td>1</td>
</tr>
<tr>
<td>U.S.S.R. Fm 3</td>
<td>About 1-7/16</td>
<td>4.0</td>
<td>95 - 100</td>
<td>Creamy</td>
<td>166</td>
<td>165</td>
<td>75</td>
</tr>
<tr>
<td>54-76</td>
<td>1-1/2</td>
<td>3.5 - 4.0</td>
<td>98 - 105</td>
<td>Creamy</td>
<td>700</td>
<td>460</td>
<td>10-12</td>
</tr>
<tr>
<td>6022, 6015</td>
<td>1-9/16 - 1-5/8</td>
<td>3.5 - 4.0</td>
<td>98 - 105</td>
<td>Creamy</td>
<td>700</td>
<td>460</td>
<td>10-12</td>
</tr>
</tbody>
</table>

Comparisons

<table>
<thead>
<tr>
<th>Country and variety</th>
<th>Staple length</th>
<th>Fineness</th>
<th>Tensile strength</th>
<th>Color</th>
<th>Yield per acre (Pounds)</th>
<th>Production (1,000 bales)</th>
<th>As percent of country’s total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt Ashmouni</td>
<td>1-1/8 - 1-5/32</td>
<td>4.0 - 4.8</td>
<td>83 - 92</td>
<td>Creamy brown</td>
<td>570</td>
<td>744</td>
<td>74</td>
</tr>
<tr>
<td>Peru Tanquis</td>
<td>1-5/32 - 1-3/8</td>
<td>4.5 - 5.2</td>
<td>86 - 95</td>
<td>White</td>
<td>421</td>
<td>432</td>
<td>12</td>
</tr>
<tr>
<td>Sudan Upland irrigated</td>
<td>1-1/8 - 1-1/4</td>
<td>2/</td>
<td>2/</td>
<td>Creamy white</td>
<td>340</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>United States Upland irrigated</td>
<td>1-1/32 - 1-5/32</td>
<td>3.5 - 4.5</td>
<td>85 - 90</td>
<td>White to creamy white</td>
<td>993</td>
<td>2,726</td>
<td>28</td>
</tr>
</tbody>
</table>

1/ Because of crop failure: 468 pounds in 1956-57. 2/ No data.
Appendix I. -- End uses of extra-long staple cotton

Belgium--Principal uses are sewing thread, poplins, voile, bed sheets, covering for electric cables, and sometimes knitted goods and hosiery. The yarn count range is 36s to 80s.

France--Principal uses are fine woven and knitted goods, undergarments, lingerie, voiles, lace, sewing thread, knitting yarn, plain velvets, trimmings and elastic fabrics. Yarn counts are mostly above 60s but for some uses above 50s.

Germany--Generally speaking, extra-long staples are spun into yarns varying from 40s to 250s with the bulk centered around 85s, 100s and above. Such yarns are manufactured into high quality goods, especially fine woven fabrics, fine knitted fabrics, sewing thread and fishing nets.

India--Extra-long staples are spun into yarns of 60s and above. Principal end-uses are superfine cloths such as voiles, mulls, dhoties, sarees, handkerchiefs, superior poplins, fancy leno cloth, lawns, cambric, etc.

Italy--Principal uses are sewing threads, laces, gloves, quality fabrics for shirts and dresses. Yarn counts are mainly from 30s to 120s.

Japan--Yarn counts are generally used for 65s count and higher. Principal end-uses are high grade broadcloth, lawn, high grade sewing thread, voile (including organdy), lacing thread, embroidery yarn, and women's gloves.

Spain--Principal uses are sewing thread, umbrella fabrics, certain types of velvets and ribbons, organdies, veils, batistes and poplins of high quality, for mixing with reworked wool, and certain industrial textiles.

Switzerland--60s to 80s are normally spun from extra-long staples and the principal uses are mousselines, voiles, poplins, marque settes (for shirts, blouses, printed cloth for ladies' dresses, handkerchiefs, curtains and embroideries.)

United Arab Republic--Extra-long staples are spun mainly into combed yarns of 80s to 100s count used in fine poplins, shirts, organdy, muslin, ladies frocks, fine handkerchiefs, sewing thread, fine hosiery and rain coats.
Summary and conclusions

in a declining market, and time is required for mills to switch over to extra-long staple cotton and to develop sales of textiles made of this type of cotton.

(i) Another possible way to bring supplies into line with demand is by cooperation between producing countries. The number of producers of extra-long staple cotton is very limited and the bulk of the production is in two countries, the United Arab Republic and the Sudan. Both of these countries, as well as other producers, have expanded their production unilaterally in the hope of obtaining a larger market and improving their own standard of living. In sum, however, they have produced more than the world could absorb and the result has been a steep decline in world prices which has had serious consequences for their economies.

(j) To bring about an improvement in the extra-long staple cotton situation, it appears that producing countries, particularly the United Arab Republic and the Sudan, first should take account of the expected world off-take of extra-long staples and then should take cooperative action to bring production into line with demand. Expansion of production could take place when there was evidence that the market for extra-long staples was growing and could absorb increased quantities. Cooperative action to maintain price stability at a reasonable level, having in mind competition from other fibers, and to conduct research and promotional campaigns to develop markets also is suggested as desirable.
United Kingdom—Among principal end-uses are lace, muslin, organdy, two-fold poplins, "air-proof and water-proof" cloths, umbrella cloth, typewriter ribbons, fine lisle stockings, gabardines, gloves, insulation for fine wiring, sewing threads, men's and women's underwear and embroidery yarns. The finest yarn, very rarely produced now, is used for lace (300s-400s) and the coarsest, also rarely produced, for embroidery (3s, 5s, 9s). The coarsest yarn produced in any quantity is 30s probably for hosiery, but the bulk is probably between 50s and 100s.

United States—Generally, extra-long staple cotton is spun into yarns of 60s and finer unless some particular use, such as sewing thread yarns, requires unusual strength or appearance in which case coarser numbers may be spun. Probably the largest single end-use is sewing thread including thread for use on high speed machines used in shoe making, manufacture of leather goods, etc. A large part of the extra-long staple cotton is made into sales yarn, which is made into shoe laces, broadcloths, lawns, organdies, voiles, twills, sateens, handkerchief fabrics, balloon fabrics, airplane fabrics, and typewriter ribbons. Also, specialty yarns for lace, tricot knitting, parachute webbing and insulation for fine electrical wiring.

Union of Soviet Socialist Republics—Extra-long staple cotton is used for spinning yarn counts of 50s and up and principally in the manufacture of fine cotton cloth, sewing thread, hosiery and knitted fabrics. This type of cotton also is used for spinning medium counts used for manufacture of technical textiles of extra strength.

<table>
<thead>
<tr>
<th>Year beginning August 1</th>
<th>U. S. upland</th>
<th>Egyptian extra-long staple</th>
<th>Extra-long staple as percent of upland</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$1/</td>
<td>$2/</td>
<td>Percent</td>
</tr>
<tr>
<td>1906</td>
<td>12.60</td>
<td>27.00</td>
<td>214.5</td>
</tr>
<tr>
<td>1907</td>
<td>12.78</td>
<td>23.82</td>
<td>186.5</td>
</tr>
<tr>
<td>1908</td>
<td>11.00</td>
<td>18.27</td>
<td>166.2</td>
</tr>
<tr>
<td>1909</td>
<td>15.70</td>
<td>29.88</td>
<td>190.7</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>13.02</strong></td>
<td><strong>24.74</strong></td>
<td><strong>189.5</strong></td>
</tr>
<tr>
<td>1910</td>
<td>16.32</td>
<td>28.12</td>
<td>172.4</td>
</tr>
<tr>
<td>1911</td>
<td>12.63</td>
<td>23.33</td>
<td>184.7</td>
</tr>
<tr>
<td>1912</td>
<td>14.00</td>
<td>21.87</td>
<td>156.2</td>
</tr>
<tr>
<td>1913</td>
<td>16.08</td>
<td>21.35</td>
<td>141.7</td>
</tr>
<tr>
<td>1914</td>
<td>15.00</td>
<td>18.33</td>
<td>166.8</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>13.81</strong></td>
<td><strong>22.60</strong></td>
<td><strong>163.8</strong></td>
</tr>
<tr>
<td>1915</td>
<td>15.04</td>
<td>26.32</td>
<td>175.0</td>
</tr>
<tr>
<td>1916</td>
<td>24.72</td>
<td>50.99</td>
<td>206.2</td>
</tr>
<tr>
<td>1917</td>
<td>43.56</td>
<td>61.27</td>
<td>140.6</td>
</tr>
<tr>
<td>1918</td>
<td>39.46</td>
<td>54.56</td>
<td>138.2</td>
</tr>
<tr>
<td>1919</td>
<td>42.40</td>
<td>96.35</td>
<td>229.7</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>37.04</strong></td>
<td><strong>57.90</strong></td>
<td><strong>175.2</strong></td>
</tr>
<tr>
<td>1920</td>
<td>19.73</td>
<td>45.72</td>
<td>232.4</td>
</tr>
<tr>
<td>1921</td>
<td>20.19</td>
<td>33.97</td>
<td>168.8</td>
</tr>
<tr>
<td>1922</td>
<td>28.70</td>
<td>32.99</td>
<td>115.1</td>
</tr>
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<td>1923</td>
<td>32.99</td>
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<tr>
<td>1924</td>
<td>27.09</td>
<td>58.76</td>
<td>216.0</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>25.74</strong></td>
<td><strong>42.16</strong></td>
<td><strong>163.8</strong></td>
</tr>
<tr>
<td>1925</td>
<td>21.82</td>
<td>40.47</td>
<td>185.5</td>
</tr>
<tr>
<td>1926</td>
<td>16.57</td>
<td>31.20</td>
<td>186.4</td>
</tr>
<tr>
<td>1927</td>
<td>22.65</td>
<td>39.38</td>
<td>173.9</td>
</tr>
<tr>
<td>1928</td>
<td>21.36</td>
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</tr>
<tr>
<td>1929</td>
<td>18.44</td>
<td>29.44</td>
<td>159.7</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>20.17</strong></td>
<td><strong>35.46</strong></td>
<td><strong>176.0</strong></td>
</tr>
</tbody>
</table>

Cont.
INTERNATIONAL COTTON ADVISORY COMMITTEE
Washington D.C.

STATEMENT ON EXTRA-LONG STAPLE COTTON
SITUATION AS OF MID-AUGUST 1959

Prepared by the Secretariat of the
International Cotton Advisory Committee

Introduction

1. This statement has been prepared to supplement and to bring up to date the Report on Extra-Long Staple Cotton prepared for the Eighteenth Plenary Meeting of the International Cotton Advisory Committee (Doc. 14, XVIII).

2. Since the Report was written the extra-long staple situation has improved considerably. Exports of extra-long staples from Egypt, Peru and the Sudan all have increased over the year before and prices have risen substantially on the world market. However, prices still are low and it can be expected that supplies in producing countries will be just as large this season as last.

Exports

3. Egypt Latest information on exports of extra-long staple cottons is given in tables 1-4. It will be noted that exports from Egypt to non-communist destinations were around 300,000 bales in 1958-59, or about the same level as in 1957-58. Exports to communist countries increased, however, from 316,000 to around 600,000 bales. This increase was principally because of an expansion in exports to the U.S.S.R. from 37,000 to over 250,000 bales.

4. Sudan Exports of extra-long staple cotton from the Sudan were 372,000 bales in August-May 1958-59 compared to 288,000 bales during the same period in the preceding season. There were increases to all destinations but France. Exports to the communist bloc doubled but were only 27,000 bales.

5. Peru Peru's exports of Pima and Karnak cottons also increased 80,000 to 115,000 bales, for the August-June period with larger exports to most countries in Western Europe and to Argentina and Chile.
6. United States exports of extra-long staple cotton increased from 10,000 bales in 1957-58 to 22,000 bales in 1958-59 (through June). This export was entirely, or almost entirely, financed by P.L. 480 arrangements with 20,500 bales going to Spain.

Table 1. Exports of Karnak and Menoufi from Egypt

<table>
<thead>
<tr>
<th>Destination</th>
<th>1956-57</th>
<th>1957-58</th>
<th>1958-59 a/ (Prelim.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000 bales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>34</td>
<td>77</td>
<td>9</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>-</td>
<td>5</td>
<td>66 b/</td>
</tr>
<tr>
<td>France</td>
<td>14</td>
<td>32</td>
<td>27</td>
</tr>
<tr>
<td>F.R. of Germany</td>
<td>20</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Italy</td>
<td>33</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Switzerland</td>
<td>12</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Spain</td>
<td>6</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>18</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td>India</td>
<td>43</td>
<td>46</td>
<td>51</td>
</tr>
<tr>
<td>Japan</td>
<td>26</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>Others</td>
<td>47</td>
<td>46</td>
<td>37</td>
</tr>
<tr>
<td>Total free world</td>
<td>253</td>
<td>323</td>
<td>293</td>
</tr>
<tr>
<td>U.S.S.R.</td>
<td>59</td>
<td>37</td>
<td>252</td>
</tr>
<tr>
<td>China</td>
<td>46</td>
<td>62</td>
<td>99</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>67</td>
<td>88</td>
<td>92</td>
</tr>
<tr>
<td>E. Germany</td>
<td>37</td>
<td>59</td>
<td>49</td>
</tr>
<tr>
<td>Poland</td>
<td>38</td>
<td>47</td>
<td>60</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>260</td>
<td>316</td>
<td>582</td>
</tr>
<tr>
<td>Total world</td>
<td>513</td>
<td>639</td>
<td>875</td>
</tr>
</tbody>
</table>

a/ Excluding cotton shipped but not cleared through Customs. Consequently, final totals will be higher.  
b/ Mostly for transhipment to other countries through triangular deals according to reports.
Table 2. Exports of Sudan Sake Is

<table>
<thead>
<tr>
<th>Destination</th>
<th>1956-57</th>
<th>1957-58</th>
<th>August - May</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1957-58</td>
</tr>
<tr>
<td>France</td>
<td>20</td>
<td>37</td>
<td>31</td>
</tr>
<tr>
<td>F.R. of Germany</td>
<td>24</td>
<td>41</td>
<td>35</td>
</tr>
<tr>
<td>Italy</td>
<td>26</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>153</td>
<td>154</td>
<td>120</td>
</tr>
<tr>
<td>India</td>
<td>51</td>
<td>68</td>
<td>55</td>
</tr>
<tr>
<td>Japan</td>
<td>5</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Communist bloc</td>
<td>14</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>304</td>
<td>356</td>
<td>288</td>
</tr>
</tbody>
</table>

Table 3. Exports of Peruvian Pima/Karnak

<table>
<thead>
<tr>
<th>Destination</th>
<th>1956-57</th>
<th>1957-58</th>
<th>August - June</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1957-58</td>
</tr>
<tr>
<td>Belgium</td>
<td>23</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Italy</td>
<td>13</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Switzerland</td>
<td>14</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>7</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>F.R. of Germany</td>
<td>14</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>India</td>
<td>12</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>92</td>
<td>80</td>
</tr>
</tbody>
</table>

* Less than 500 bales.
Table 4. Exports of extra-long staples from the United States

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000 bales</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>1.2</td>
<td>0</td>
</tr>
<tr>
<td>France</td>
<td>3.3</td>
<td>0</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0</td>
<td>1.2</td>
</tr>
<tr>
<td>Spain</td>
<td>0</td>
<td>20.5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4.8</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>.5</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>9.8</td>
<td>22.0</td>
</tr>
</tbody>
</table>

7. Export summary

In all, exports of extra-long staple cotton have shown an increase of around 33 percent over 1957-58 and will be at the highest level in several years at least. For the August-May period, aggregate exports from the four major producing countries increased from 1,245,000 bales in 1957-58 to 1,245,000 bales in 1958-59. Of the increase of 327,000 bales, 220,000 bales represented increased shipments to communist bloc countries and 108,000 bales increased shipments to Western Europe and other non-communist destinations. Exports to the United States declined according to the figures but this probably was because of timing in connection with U.S. import quotas because the United States imported 85,000 bales from August through May 1958-59 compared to 43,500 bales in the same period 1957-58 (table 5).

8. The increase in exports of extra-long staple cotton in recent months apparently has been accompanied by a corresponding increase in consumption at least in the non-communist world. Many of the major importing countries are still not providing the ICAC with statistics on consumption and stocks of extra-long staples but available information indicates that consumption of extra-long staple cotton increased from 800,000 bales in 1957-58 to around 1,000,000 bales in 1958-59 (table 6). Trade reports indicate some amount of switching from medium staples to extra-long staples in Western Europe. In the United Kingdom, for instance, the percentage of total cotton consumption comprised by extra-long staples increased from 12.8 percent in 1957-58 to 19.5 percent in March-May 1959. (Table 7).
Table 8. Recent cotton production data
(For earlier data, see pages 12-18 of Doc. 14-XVIII, Report on Extra-Long Staple Cotton)

<table>
<thead>
<tr>
<th>Country and season</th>
<th>Karnak</th>
<th>Menoufi</th>
<th>Giza 45</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1957-58</td>
<td>631</td>
<td>328</td>
<td>1</td>
<td>960</td>
</tr>
<tr>
<td>1958-59</td>
<td>541</td>
<td>633</td>
<td>3</td>
<td>1,177</td>
</tr>
<tr>
<td>1959-60</td>
<td>266</td>
<td>663</td>
<td>14</td>
<td>943</td>
</tr>
<tr>
<td>Pounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1957-58</td>
<td>333</td>
<td>593</td>
<td>478</td>
<td>422</td>
</tr>
<tr>
<td>1958-59</td>
<td>405</td>
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<td>1959-60</td>
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</tr>
<tr>
<td>1,000 bales</td>
<td>439</td>
<td>407</td>
<td>1</td>
<td>847</td>
</tr>
<tr>
<td>1958-59</td>
<td>458</td>
<td>715</td>
<td>3</td>
<td>1,176</td>
</tr>
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<td>1959-60</td>
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<table>
<thead>
<tr>
<th>Egyptian types: Irrigated</th>
<th>American</th>
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<tr>
<td>Gravity</td>
<td>Pump</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1,000 acres</td>
<td></td>
</tr>
<tr>
<td>Sudan</td>
<td></td>
</tr>
<tr>
<td>1957-58</td>
<td>265</td>
</tr>
<tr>
<td>1958-59</td>
<td>333</td>
</tr>
<tr>
<td>1959-60</td>
<td></td>
</tr>
<tr>
<td>Pounds</td>
<td></td>
</tr>
<tr>
<td>1957-58</td>
<td>143</td>
</tr>
<tr>
<td>1958-59</td>
<td>442</td>
</tr>
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<td>1959-60</td>
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</tr>
<tr>
<td>1,000 bales</td>
<td>79</td>
</tr>
<tr>
<td>1958-59</td>
<td>308</td>
</tr>
<tr>
<td>1959-60</td>
<td></td>
</tr>
<tr>
<td>Pima and Karnak</td>
<td>Tanguis</td>
</tr>
<tr>
<td>1,000 bales</td>
<td>107.2</td>
</tr>
<tr>
<td>Peru</td>
<td></td>
</tr>
<tr>
<td>1957-58</td>
<td></td>
</tr>
<tr>
<td>1958-59</td>
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<td>1959-60</td>
<td></td>
</tr>
<tr>
<td>Allotment</td>
<td>Acreage harvested</td>
</tr>
<tr>
<td>United States</td>
<td>1,000 acres</td>
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<tr>
<td>1957-58</td>
<td>84.8</td>
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<tr>
<td>1958-59</td>
<td>79.7</td>
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<tr>
<td>1959-60</td>
<td>68.6</td>
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Table 9. Supply of extra-long-staple cotton in producing countries in a non-communist world

<table>
<thead>
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<th></th>
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<td>Stocks, August 1</td>
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<tr>
<td>Egypt</td>
<td>1,000 bales</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Sudan</td>
<td>225</td>
<td>190</td>
<td>100</td>
<td>160</td>
<td>305</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>205</td>
<td>280</td>
<td>185</td>
<td>430</td>
<td>240</td>
<td>275</td>
<td></td>
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<tr>
<td>U.S.A. 1/</td>
<td>103</td>
<td>140</td>
<td>107</td>
<td>2/82</td>
<td>109</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>13</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>555</td>
<td>631</td>
<td>410</td>
<td>2/692</td>
<td>693</td>
<td>910</td>
<td></td>
</tr>
</tbody>
</table>

Production

| Egypt         | 1,000 bales |       |       |       |       |       |         |
| Sudan         | 340   | 390   | 554   | 165   | 535   |         |         |
| Peru          | 79    | 70    | 108   | 107   | 129   |         |         |
| U.S.A. 1/     | 41    | 42    | 49    | 80    | 82    | -72    |         |
| Others        | 28    | 31    | 29    | 33    | 23    |         |         |
| Total         | 1,019 | 1,085 | 1,354 | 1,236 | 1,949 |         |         |

Supply

| Egypt         |       |       |       |       |       |       |         |
| Sudan         | 756   | 742   | 714   | 1,011 | 1,485 | 1,500 |         |
| Peru          | 595   | 670   | 739   | 545   | 775   |         |         |
| U.S.A. 1/     | 94    | 85    | 118   | 117   | 149   |         |         |
| Others        | 144   | 182   | 156   | 162   | 191   | -180   |         |
| Total         | 1,574 | 1,716 | 1,764 | 1,928 | 2,636 |         |         |

1/ Domestic cotton only. 2/ Includes addition of 50,000 bales from stockpile. 3/ Preliminary. 4/ Rough estimate based on official acreage and reported good weather.
smaller than the production of long staples (Ashmouni, etc.) but in 1958-59 was larger. In the last three seasons, the extra-long staples have accounted for 46 percent of the total value of cotton production. The importance of the extra-long staples in the U. A. R.'s balance of payments is seen in the fact that exports of these cottons were valued at 197 million dollars in 1956-57 and 172 million dollars in 1957-58, 49 percent and 35 percent respectively of the total export trade of Egypt.

In Peru, extra-long staple cotton provides a gross income of around 20 million dollars, more than one-fifth the income from all types of cotton and about 2 percent of the national income. Exports of extra-long staples have been valued at more than 50 million dollars annually and comprised 8 percent of the total export trade in 1955-56, 6 percent in 1956-57.

Of the major cotton-growing countries, none is more dependent on the extra-long staples than the Sudan. The crop was valued at 65 million dollars in 1955-56 and 14 million dollars in 1956-57 but declined to 26 million dollars with last season's crop failure. The extra-long staples accounted for 98 percent of the total value of all cottons grown in 1956-57 and 84 percent last season. Exports of extra-long staples comprised 28 percent of the Sudan's total exports in 1956-57 and 50 percent last season.

In the United States, the extra-long staple crop has increased in value from 11 million dollars in 1955-56 to 22 million dollars in 1957-58. Although the crop is important in the economy of the area where it is produced, it comprises only about 1 percent of the value of the U. S. cotton crop. Exports usually have been very limited except in 1956-57 when they reached 21 million dollars but last season they were down to 3 million dollars, less than one-half of one percent of U. S. cotton exports.

Supply and distribution. The present extra-long staple situation, as shown statistically in Table 5, can be summarized briefly as follows:

(1) There has been a very large increase in the production of extra-long staple cotton this season; (2) with beginning stocks in producing countries at a high level, the supply this season of 2.6 million bales is more than double the disappearance in any of the last four seasons; (3) while a moderate increase in disappearance is a possibility this season, it is almost certain that there will be a substantially increased carryover into next season. As a consequence of the situation portrayed by these figures, there has been a downward trend in prices for extra-long staple cotton throughout this season and prices are now the lowest since the end of World War II.
ARIZONA PIMA COTTON PRODUCTION -- 1912-1958

UTAH
STATE TOTAL -- 1,040,629 BALES

BY COUNTIES AS SHOWN BELOW:

NEVADA

CALIFORNIA

WASHINGTON

MOHAVE

SAN BERNARDINO

RIVERSIDE

IMPERIAL

2,694 Bales

ARIZONA

MARICOPA

YAVAPAI

GILA

BURBANK

GOGOMINO

SAN JUAN

NAVAJO

APACHE

UTAH STATE TOTAL -- 1,040,629 BALES

714,282 Bales

164,457 Bales

48,965 Bales

1,204 Bales

MEXICO

590 Bales

This Map is also available in size 17 x 22
A SELECTED
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*Publications and Reports*

Key: AMS--Agricultural Marketing Service
BAE--Bureau of Agricultural Economics
BPI--Bureau of Plant Industry
FAS--Foreign Agricultural Service
OES--Office of Experimental Stations
PMA--Production Marketing Administration

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