# Part 1: Cotton

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**Abstract**

**Cotton** acreage, production, and prices have been influenced by Government programs since the 1930's in an attempt to meet market needs, with varying degrees of success. The Food Security Act of 1985 is generally considered successful in dealing with the cotton sector despite several problems. The marketing loan provisions of the act helped make cotton competitive in world markets in 1987 and some market share was regained. However, consistently competitive pricing has been somewhat elusive. In 1988-89 problems with the adjusted world price formula and with the storage terms resulted in noncompetitive prices for U.S. cotton. A rule change on the adjusted world price formula and prices above the loan rate helped restore competitiveness. While the general preference for 1990 legislation for cotton will likely be for stability, the combination of budget, trade, environment and flexibility issues may result in more than fine tuning of the current act.

## Summary

The health of the U.S. cotton industry depends on the world economy. U.S. exports vary greatly from year to year, depending on foreign cotton output and general economic conditions, which contribute to supply and price instability. However, the United States will likely continue to be the world's leading cotton exporter.

Since the turn of the century, U.S. cotton producers have frequently experienced excess production capacity, high stocks, and low product prices. Government programs since the early 1930's have attempted to support prices and adjust acreage and production to market needs. These programs may have stabilized and improved net incomes and slowed the transfer of resources out of cotton production. However, until recently, cotton farms continued to increase in size in response to economic and technological forces.

While there have been year-to-year changes in acreage planted to cotton, the long-term trend has been downward. On the other hand, production has remained relatively stable because of substantial increases in yields. Since 1980, the farm value of the cotton crop has not been enough to pay all costs of production. But Government payments have made cotton production profitable overall. Still, one in five cotton farms had negative net farm income in 1987, a very good year for cotton farmers. No deficiency payments were made to cotton producers from 1974 through 1980 since prices received were above target prices. However, large deficiency payments were made during 1981-88 when Government payments (except in 1983 and 1986) comprised between 12 percent and 23 percent of total income from cotton.

As with wheat and feed grains, Government programs for cotton to control production, stabilize prices, and support income have been in effect for 50 years. Acreage allotments, marketing quotas, and price supports based on parity were in effect during the early years, with the exception of 1943-49 and 1951-53 when allotments and quotas were temporarily removed. Allotments remained in effect at varying levels from 1954 through 1970. The 1965 Food and Agriculture Act changed cotton policy by clearly separating price and income supports. The market price of cotton was supported at 90 percent of the estimated world price level. This allowed domestic market prices to seek world price levels. Payments to farmers were based on their participation in an acreage reduction program. By the end of 1970, the huge surpluses of cotton were gone. The voluntary program to reduce acreage had met the objective of reducing stocks, but the direct payments in excess of $600 million during the late 1960's had resulted in relatively high U.S. Treasury costs.

The programs of the 1970's continued to recognize the importance of the world market price in setting the loan rate of cotton. The 1973 Act established target prices, which provided for direct payments to producers if market prices fell below target price levels. The 1977 Act set target prices based on the cost of production, but this adjustment was removed in the 1981 Act, which established the 1981-85 target prices at successively higher levels. The programs of the early 1980's continued the market oriented loan rate formula, combined with relatively high deficiency payments. However, substantial acreage reductions to reduce surpluses were required, culminating in the payment-in-kind program of 1983.

The Food Security Act of 1985 established cotton farm policy for the 1986-90 crop years. Some major features of past farm acts were retained, including acreage limitations, nonrecourse loans, and target prices. But, the act also gave the Secretary of Agriculture more discretionary authority for administering the program. In contrast to earlier programs, the 1985 Act specified declining target price minimums through 1990. A major new provision of the act, the marketing loan, provided a loan repayment plan allowing loans to be repaid at levels below the loan rate if world market prices (adjusted to U.S. quality and location) were below the loan rate. The program performed effectively during 1986/87 and part of the 1987/88 season as both exports and domestic cotton use increased and stocks fell. Since then, changing foreign supply and demand conditions and problems with the mechanics of the program itself forced numerous adjustments in program provisions as U.S. cotton struggled to be competitive in world markets.

## Introduction

Upland cotton comprises 98 percent of all cotton grown in the United States. Extra-long staple (ELS) cotton, which historically has been considered a unique crop for program purposes, is not covered in this report. Cotton is the single most important textile fiber in the world, accounting for about 67 percent of all fibers used. Cotton is grown in about 75 countries. China, the Soviet Union, and the United States account for about 60 percent of world production. During 1986-88, the United States produced about 20 percent of the world's cotton and used 10 percent.

Cotton has been a major cash crop and an important source of foreign exchange in the United States for nearly 200 years. Cotton was first grown in the United States at Jamestown in the early 17th century, but it remained a minor crop until 1793 when Eli Whitney invented the cotton gin to separate the seed from the lint. This development spurred production, with most of the lint being exported to textile mills in England. In 1850, for example, nearly 90 percent of lint production was exported, with the earnings offsetting the costs of about two-thirds of all goods imported into the United States. U.S. exports of raw cotton during 1980-82 accounted for about 30 percent of world cotton trade. Export earnings averaged about $2 billion, or about 5 percent of the total value of U.S. agricultural exports.

In 1987, cotton ranked fifth ($4.6 billion) among the major field crops in value of farm production, following corn ($14.0 billion), soybeans ($11.3 billion), harvested hay ($9.1 billion), and wheat ($5.4 billion).

Cotton lint is used chiefly in clothing and home furnishings, with lesser amounts used in industrial products. The seeds are crushed for oil and the remaining meal is fed to livestock as a protein meal. The short fuzz on the seed, called linters, has many uses, including padding materials, nonwoven fabric, and as a source of cellulose for making rayon, plastics, and other products.

## Structure of the Cotton Industry

### Production Characteristics

Cotton is currently produced in 17 States from California to Virginia, with major concentrations in the Delta areas of Mississippi, Arkansas, and Louisiana; the Texas High Plains and Rolling Plains; central Arizona; and the San Joaquin Valley of California. Forces influencing location of production are ultimately reflected in relative returns among products that can be grown in an area and costs of inputs, which determine comparative advantages of production among areas. Soils, topography, elevation, temperature, and water availability are important determinants of where and how well cotton can be produced. The northern limit in the United States is established by a need for at least 200 days between killing frosts and a minimum average summer temperature of 77 degrees.

The predominant type of cotton grown in the United States, Gossypium hirsutum, is better known as American upland cotton. It typically accounts for about 98 percent of the total U.S. cotton crop. It is grown throughout the Cotton Belt as well as in most of the major cotton producing countries. Another type of cotton grown in the United States, Gossypium barbadense, is commonly referred to as American-Pima, or extra-long staple (ELS) cotton. ELS cotton is grown chiefly in west Texas, New Mexico, and Arizona where it is particularly well adapted to environmental conditions. The production of ELS cotton is small relative to that of upland cotton because its production costs per pound are higher and its markets are chiefly high-value products such as sewing thread and expensive apparel items.

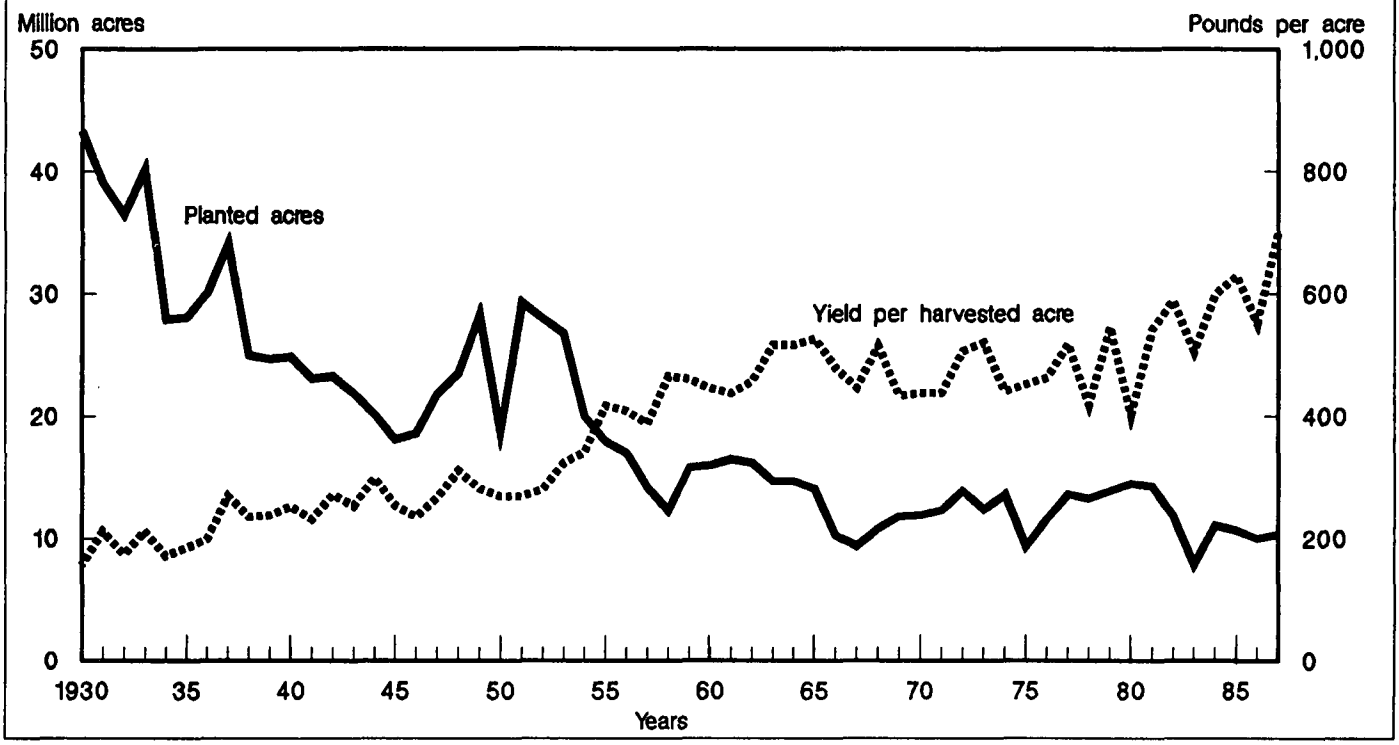
#### *Trends in Acreage, Yield, and Production*

Cotton acreage in the United States increased from less than 8 million acres at the end of the Civil War to more than 44 million acres in the mid-1920's. Production over that period ranged from about 2 million bales in 1866 to about 18 million bales in 1926. Cotton yields averaged about 180 pounds per harvested acre and rarely exceeded 200 pounds during the 1866-1930 period.

From 1930 to the mid-1960's, acreage trended down but yields moved upward (fig. 1). Yields increased from 269 pounds per harvested acre in 1950 to 527 pounds in 1965, about 4.5 percent per year. Since 1965, yields have shown considerable fluctuation but no obvious trend until the 1980's when average yield began to climb. While Government programs and prices of cotton and competing crops have influenced acreage, weather has been the chief determinant of year-to-year variability in yields. U.S. production has averaged more than 12 million bales a year during the past decade, fluctuating from a low of 7.8 million bales in 1983 to a high of 15.6 million bales in 1981.

The westward shift of U.S. cotton production seems to have ended. In 1980, the West (California, Arizona, and New Mexico) accounted for about 41 percent of U.S. output, up from 16 percent in 1970 (table 1). In contrast, the southeastern share had declined to about 5 percent of the total. The Southwest (Texas and Oklahoma) and the West accounted for nearly 74 percent of U.S. cotton production by 1980, compared with 51 percent in 1970. This regional shift was due chiefly to lower average farm production costs in the West and Southwest and to the elimination of marketing quotas and the restrictive acreage allotments that were tied to historical locations of production. Since 1980 the share of production in the Southeast and the Delta has increased. By 1987 the share of production in the West and Southwest had dropped to about 60 percent.

Figure 1
**U.S. cotton acreage and yield**




Cotton's primary competitors for land include soybeans and, to a lesser extent, corn in the Southeast and Delta, grain sorghum and wheat in the Southwest, and wheat, hay crops, and barley in the irrigated Far West. Competition from soybeans has resulted in significant fluctuation in cotton acreage in the Delta in recent years.

***Number and Size of Farms***

The trend to fewer and larger cotton farms appears to have ended (table 2). Like most other kinds of farms, there has been a long-term trend to fewer but larger cotton farms in response to economic and technological forces. In 1949 there were 1,110,000 farms growing cotton in the United States with an average of 24 acres of cotton per farm. By 1982 the number of farms dropped to 38,000 and average acreage increased to 256 acres. Cotton acreage per farm increased 87 percent from 1974 to 1982 while the number of farms dropped by 43 percent. However, preliminary data from the 1987 Census of Agriculture indicate that the number of farms producing cotton is up about 10 percent since 1982 and the number of acres of cotton per farm is down about 10 percent.

Acres harvested in 1987 were slightly less than in 1982, so the increase in number of farms growing cotton was not due to increased area in production. A probable explanation for the change in the long-term trend toward fewer and larger cotton farms is a substantial restructuring of farm ownership and operation in response to economic conditions, tax laws and other regulations, and cotton programs.

The largest number of cotton farms in 1987 was in the class with sales between $100,000 and $250,000 (table 3). Gross, net, and family income went up as sales increased, but the largest sales class earned less off-farm income than the next smaller sales class. However, a larger proportion (28.9 percent) of farms with sales over $500,000 had negative net farm income than any other sales class. Net family income was calculated by subtracting $17,400 from net income from all sources.

Farms from the smallest sales class had the largest proportion of farms with negative family income (42.8 percent), but over 28 percent of the farms in the largest sales class also had negative net family income.

There is little vertical or horizontal integration in cotton production. The corporate form of organization, although increasing, is undertaken by farm operators chiefly to take advantage of tax policies, limited liability, or property transfer provisions. Cotton production has

**Table 1—Cotton acreage harvested, yield per harvested acre, and production, by region, 1965-87**

| Crop year[1] | Southeast[2] | Delta[3] | Southwest[4] | West[5] | United States[6] |
|---|---|---|---|---|---|
| | | | *1,000 acres* | | |
| Acreage: | | | | | |
| 1965 | 2,280 | 3,974 | 6,293 | 1,068 | 13,615 |
| 1970 | 1,375 | 3,355 | 5,487 | 938 | 11,155 |
| 1975 | 690 | 2,616 | 4,317 | 1,173 | 8,796 |
| 1976 | 898 | 3,611 | 4,913 | 1,492 | 10,914 |
| 1977 | 808 | 3,388 | 7,129 | 1,949 | 13,275 |
| 1978 | 574 | 2,862 | 6,936 | 2,028 | 12,400 |
| 1979 | 613 | 2,412 | 7,552 | 2,254 | 12,831 |
| 1980 | 672 | 2,846 | 7,565 | 2,132 | 13,215 |
| 1981 | 764 | 2,943 | 7,971 | 2,163 | 13,841 |
| 1982 | 623 | 2,381 | 4,847 | 1,882 | 9,734 |
| 1983 | 470 | 1,683 | 3,930 | 1,264 | 7,347 |
| 1984 | 697 | 2,629 | 5,095 | 1,058 | 10,379 |
| 1985 | 807 | 2,595 | 5,030 | 1,797 | 10,229 |
| 1986 | 722 | 2,545 | 3,801 | 1,289 | 8,357 |
| 1987 | 823 | 2,784 | 4,801 | 1,491 | 9,899 |
| 1988 | 988 | 3,277 | 5,736 | 1,735 | 11757 |
| | | | *Pounds per acre* | | |
| Yield: | | | | | |
| 1965 | 453 | 610 | 401 | 1,112 | 527 |
| 1970 | 410 | 546 | 310 | 846 | 438 |
| 1975 | 422 | 457 | 293 | 1,050 | 453 |
| 1976 | 413 | 382 | 348 | 1,083 | 465 |
| 1977 | 313 | 542 | 411 | 967 | 520 |
| 1978 | 473 | 493 | 297 | 725 | 420 |
| 1979 | 501 | 609 | 392 | 1,013 | 547 |
| 1980 | 355 | 409 | 232 | 1,021 | 404 |
| 1981 | 541 | 554 | 376 | 1,142 | 542 |
| 1982 | 749 | 747 | 302 | 1,082 | 590 |
| 1983 | 415 | 564 | 323 | 1,042 | 508 |
| 1984 | 722 | 701 | 367 | 1,029 | 600 |
| 1985 | 741 | 689 | 404 | 1,131 | 630 |
| 1986 | 493 | 577 | 347 | 1,110 | 547 |
| 1987 | 571 | 791 | 498 | 1,264 | 702 |
| 1988 | 515 | 689 | 462 | 1,038 | 616 |

Continued—

**Table 1—Cotton acreage harvested, yield per harvested acre, and production, by region, 1965-87 —Continued**

| Crop year[1] | Southeast[2] | Delta[3] | Southwest[4] | West[5] | United States[6] |
|---|---|---|---|---|---|
| | | | *1,000 bales* | | |
| Production: | | | | | |
| 1965 | 2,150 | 5,051 | 5,262 | 2,475 | 14,938 |
| 1970 | 1,175 | 3,819 | 3,545 | 1,653 | 10,192 |
| 1975 | 607 | 2,491 | 2,636 | 2,567 | 8,302 |
| 1976 | 733 | 2,874 | 3,565 | 3,368 | 10,580 |
| 1977 | 527 | 3,827 | 6,109 | 3,927 | 14,389 |
| 1978 | 566 | 2,939 | 4,288 | 3,063 | 10,856 |
| 1979 | 639 | 3,061 | 6,172 | 4,757 | 14,629 |
| 1980 | 498 | 2,424 | 3,664 | 4,536 | 11,122 |
| 1981 | 862 | 3,394 | 6,244 | 5,146 | 15,646 |
| 1982 | 972 | 3,707 | 3,049 | 4,235 | 11,963 |
| 1983 | 406 | 1,979 | 2,643 | 2,743 | 7,771 |
| 1984 | 1,049 | 3,842 | 3,992 | 4,098 | 12,982 |
| 1985 | 1,246 | 3,723 | 4,313 | 4,151 | 13,432 |
| 1986 | 740 | 3,057 | 2,746 | 2,982 | 9,525 |
| 1987 | 979 | 4,587 | 5,518 | 3,791 | 14,475 |
| 1988 | 1,061 | 4,707 | 5,518 | 3,791 | 15,077 |
| | | | *Percent* | | |
| Regional shares of U.S. production: | | | | | |
| 1965 | 14.4 | 33.8 | 35.2 | 16.6 | 100 |
| 1970 | 11.5 | 37.5 | 34.8 | 16.2 | 100 |
| 1975 | 7.3 | 30.0 | 31.7 | 30.9 | 100 |
| 1976 | 7.3 | 27.2 | 33.7 | 31.8 | 100 |
| 1977 | 3.7 | 26.6 | 42.5 | 27.3 | 100 |
| 1978 | 5.2 | 27.1 | 39.5 | 28.2 | 100 |
| 1979 | 4.4 | 20.9 | 42.2 | 32.5 | 100 |
| 1980 | 4.5 | 21.8 | 32.9 | 40.8 | 100 |
| 1982 | 8.1 | 31.0 | 25.5 | 35.4 | 100 |
| 1983 | 5.2 | 25.5 | 34.0 | 35.3 | 100 |
| 1984 | 8.1 | 29.6 | 30.7 | 31.6 | 100 |
| 1985 | 9.3 | 27.7 | 32.1 | 30.9 | 100 |
| 1986 | 7.8 | 32.1 | 28.9 | 31.3 | 100 |
| 1987 | 6.8 | 34.7 | 34.4 | 27.1 | 100 |
| 1988 | 7.0 | 31.2 | 36.6 | 25.1 | 100 |

[1]Year beginning August 1. [2]Virginia, North Carolina, South Carolina, Georgia, Florida, and Alabama. [3]Missouri, Arkansas, Tennessee, Mississippi, Louisiana, Illinois, and Kentucky. [4]Texas, Oklahoma, and New Mexico. Includes ELS cotton. [5]California, Arizona, and Nevada. Includes ELS cotton. [6]Totals may not add due to rounding.

not attracted a substantial influx of capital investment by nonfarm corporations.

***Tenure of Farm Operators***

Share renting and cash renting of land for cotton production are common practices in all cotton production regions. According to the 1982 Census of Agriculture, about 45 percent of the farms harvesting cotton were operated by part-owners, 25 percent by tenants, and 30 percent by full owners.

Over 80 percent of the farms harvesting cotton in 1978 were individual family operations, 13 percent were partnerships, and 4 percent were corporations. The proportion and number of corporations increased somewhat between 1978 and 1982. However, about 90 percent of the corporations were family-held in 1978. The pro-

**Table 2—Number of farms harvesting cotton and acres of cotton per farm, by region and State**

| Region/State | Number of farms | | | Cotton area per farm | | |
|---|---|---|---|---|---|---|
| | 1974 | 1982 | 1987 | 1974 | 1982 | 1987 |
| | | *Number* | | | *Acres* | |
| Southwest | 16,020 | 3,265 | 4,297 | 82 | 181 | 162 |
| Alabama | 6,827 | 1,458 | 1,820 | 79 | 202 | 190 |
| Georgia | 4,279 | 770 | 1,733 | 87 | 171 | 134 |
| North Carolina | 2,405 | 620 | [1] | 60 | 111 | [1] |
| South Carolina | 2,509 | 417 | 744 | 102 | 229 | 156 |
| Delta | 34,228 | 10,921 | 13,138 | 123 | 214 | 210 |
| Arkansas | 7,585 | 2,109 | 2,479 | 147 | 201 | 214 |
| Louisiana | 4,486 | 2,371 | 2,675 | 130 | 237 | 221 |
| Mississippi | 1,277 | 3,710 | 4,225 | 150 | 264 | 243 |
| Tennessee | 8,119 | 1,850 | 2,545 | 61 | 131 | 162 |
| Missouri | 2,761 | 971 | 1,214 | 109 | 149 | 163 |
| Southwest | 33,918 | 19,839 | 20,167 | 152 | 253 | 237 |
| Oklahoma | 6,089 | 2,848 | 2,913 | 82 | 146 | 126 |
| Texas | 26,334 | 16,292 | 16,557 | 171 | 278 | 263 |
| New Mexico | 1,459 | 699 | 697 | 98 | 112 | 114 |
| West | 5,152 | 4,179 | 4,236 | 301 | 438 | 346 |
| Arizona | 1,143 | 1,177 | 1199 | 351 | 441 | 318 |
| California | 4,009 | 3,002 | 3037 | 287 | 437 | 357 |
| United States | 89,536 | 38,266 | 41,838 | 137 | 256 | 232 |

[1]Preliminary 1987 Census summary data did not include cotton for North Carolina.

**Table 3—Income of cotton farms by sales class, 1987[1]**

| Sales class | Number of farms | Income | | | | Farms with negative income | |
|---|---|---|---|---|---|---|---|
| | | Gross farm | Net farm | Off-farm | Family[2] | Net farm | Net[3] family |
| | *Number* | | *$1,000* | | | *Percent* | |
| $39,999 or less | 5,807 | 27.7 | 8.5 | 17.9 | 26.4 | 24.6 | 42.8 |
| $40,000 to $99,999 | 5,903 | 81.6 | 23.1 | 15.2 | 38.2 | 15.9 | 28.8 |
| $100,000 to $249,999 | 7,099 | 186.8 | 48.7 | 19.9 | 68.5 | 20.0 | 22.4 |
| $250,000 to $499,999 | 2,033 | 392.0 | 28.3 | 14.5 | 14.2 | | |
| | | 115.6 | 143.9 | | | | |
| $500,000 or over | 1,783 | 978.3 | 27.8 | 28.9 | 28.7 | | |
| | | 141.4 | 169.2 | | | | |
| All farms | 22,611 | 199.2 | 44.9 | 19.5 | 64.5 | 20.3 | 29.1 |

[1]Farms for which cotton constitutes 50 percent or more of either sales or acres harvested.
[2]Net farm income plus off-farm income.
[3]Calculated after $17,400 is subtracted from family income for estimated family living expenses.

portion of individual or family operations decreased as the acres of cotton harvested per farm increased.

**Trends In Domestic Cotton Use**

Domestic cotton use reached an historic high in the United States in 1987 at 12.1 million bales. Domestic cotton use equals mill use plus the cotton in textile imports minus the cotton in textile exports. The previous record domestic use was in 1942 when 11.3 million bales were used. Domestic use reached a post-World War II peak of 10.4 million bales or 25.4 pounds per person in 1966. Competition with manmade fibers and slower real economic growth beginning in the 1970's caused domestic cotton use to decline to 6.5 million bales by 1982 when per capita consumption fell to only 13.5 pounds per person. Since 1982 there has been a steady and rapid growth in consumer demand for cotton. By 1987 per capita consumption had risen to 23.9 pounds.

Foreign textile producers seem to have a basic labor-cost advantage over U.S. textile producers, especially in the apparel sector, and cotton textile imports grew at an average compound rate of about 4.6 percent between 1965 and 1980. The average compound annual rate of growth of textile imports increased to about 16 percent during 1980-87, in part due to the increase in the value of the dollar since 1980 and the strength of the U.S. economy relative to foreign economies in 1983. The raw cotton equivalent of U.S. textile imports totaled a record 4.9 million bales in 1987. But, the growth of imports slowed down in 1988 and totaled about 4.4 million bale-equivalents, representing a 10-percent decrease in volume but a slight increase in value.

Additional imported products increase the supply of cotton textiles available to American consumers at the retail level. In 1987, 53 percent of the fibers in imported textiles were cotton, while cotton accounted for only 29 percent of the fibers used in U.S. mills. Also, apparel prices at the retail level are declining in real terms, and lower prices are encouraging increased domestic use. The consumer price index (CPI) for apparel products (1967= 100) rose from 179 in 1980 to 208 in 1986. The overall CPI rose from 270 to 405 over that same period, implying about a 14-percent drop in real retail prices of apparel products.

Mill use of cotton reached 9.6 million bales in 1966 and declined to 5.3 million bales in 1981 before recovering to 7.6 million in 1987. During 1966-83, cotton mill use declined at a compound annual rate of 3.3 percent. The decline in mill use was caused primarily by two factors: the loss of market share to manmade fibers, mainly polyester, and the loss of market share to textile imports.

Cotton's share of mill consumption dropped from 90 percent in 1960 to 59 percent in 1980. From 1966 to 1983, cotton's share of total use in the cotton system (mills and spindles adapted to the use of cotton) declined from 81.5 percent to 60.3 percent. Manmade fiber's strength, uniformity, and ease of handling and care account for much of the decline in cotton's share of mill use. Costs to mills were higher for cotton than for polyester and rayon during most of the 1970's.

If cotton had maintained its 1966 share of cotton-system fiber use at 81.5 percent, the decline in cotton mill use would have been more than 2 million bales less than actually occurred between 1966 and 1980 when cotton's share of total mill consumption reached its lowest point. Since 1980 cotton's share of total mill consumption rose to 67.4 percent in 1987. However, the entire cotton system is becoming smaller. This is partly because manmade fibers have entirely supplanted cotton in some end uses such as tire cord and carpeting, but mostly because the cotton textile trade deficit (the excess of imports over exports of cotton textiles on a raw-fiber equivalent basis) grew from 668,000 bales in 1966 to 1.9 million bales in 1983. During 1966 to 1983, total fiber use in the cotton system declined from the equivalent of 12.1 million bales to 9.6 million bales, implying an additional 2-million-bale loss in cotton mill use.

In recent years consumer preference for cotton has led to both increased mill use of cotton and a greater share of total mill consumption. This was at the same time that textile imports were growing rapidly.

In 1980, the cotton textile trade deficit represented only 8.5 percent of domestic cotton use. That year, imports reached 1.7 million bale-equivalents while cotton textile exports equaled 1.1 million bales, for a trade deficit of 590,000 bales. In 1983, the United States imported 2.3 million bale-equivalents of cotton in the form of textile products, and exported 460,000 bale-equivalents. The resulting deficit of 1.9 million bale-equivalents represented about 25 percent of all the cotton used in the United States in 1983. In 1988 4.4 million bale-equivalents were imported as textiles and 688,000 bale-equivalents were exported.

End uses of cotton include apparel, household, and industrial products. On average, clothing accounts for

about 256 pounds of total end use of a 480-pound bale of cotton delivered to a textile mill (fig. 2). Home furnishings and industrial products account for 138 pounds and 64 pounds.

## Trends in World Cotton Trade

Forces affecting world cotton trade are complex. Since cotton is an input for the production of clothing, it can be traded as raw cotton, yarn, fabric, or finished apparel. The United States is a competitive exporter of raw cotton, but other countries, many of them also cotton producers, are more competitive as exporters of finished products (tables 4 and 5). The demand for U.S. raw cotton exports depends heavily on: (1) foreign cotton production, (2) U.S. cotton price relative to the cotton prices of competing exporters, (3) the price of cotton relative to other fibers, and (4) the rate of economic growth in importing nations. For example, it has been estimated that a 1-percent increase in real income of foreign importing countries is associated with about a 120,000-bale increase in U.S. cotton exports. If our major competitors increase their production by 1 million bales, U.S. exports might drop by about 600,000 bales in the short run.

World cotton production increased from an average of 54.5 million bales in 1964-68 to an estimated 80.5 million bales in 1984-88, an increase of 48 percent. Cotton trade, however, increased only 32 percent in the same period, from an average of 17.3 to 22.8 million bales. Hence, a larger share of world cotton production is now milled within producing countries.

Even though cotton production and trade have increased worldwide, cotton's share of world fiber production fell from 58 to 50 percent between 1967 and 1987. All natural fibers have lost markets to manmade fibers, especially during the past 20 years. The development of polyester in the 1950's brought intense competition with other cotton, rayon, and acetate and was instrumental in cotton's loss of market share. However, within the apparel and home furnishing markets, cotton and other natural fibers have enjoyed increased popularity during the 1980's. These and other developments mean that world producers in search of export growth will compete for a larger share of a slowly expanding market.

### *Changes in Importing Countries*

Eight countries account for about 60 percent of world cotton imports. Japan is by far the most important cotton importer with a 15-percent share of world imports in 1986-87. The Japanese share fell 2-3 percent during the 1970's as other East Asian textile producers--Taiwan, Hong Kong, and South Korea--expanded mill capacity and increased cotton imports. In 1986-87, South Korea purchased 8 percent of world cotton imports while Taiwan and Hong Kong had import market shares of 9 and 5 percent. The share of trade held by China increased from an average of less than 3 percent in 1960-64 to more than 17 percent in 1979 and 1980.

China's imports have tapered off sharply since 1980, however, as Chinese cotton production has expanded. In 1986 and 1987, Chinese cotton imports comprised less than 1 percent of world imports. In 1988, however, Chinese cotton imports were expected to account for about 6 percent of world imports. While China is a major net exporter of raw cotton, its increasing domestic consumption, limited arable land, and intense competition for land among crops have placed it at a crossroads with respect to production and further highlighted its role in international cotton trade.

The major European cotton importers--France, Italy, and Germany--have declined in importance since the early 1960's as these countries have moved heavily into the use of manmade fibers. Each of these countries currently purchases 3-6 percent of world cotton imports.

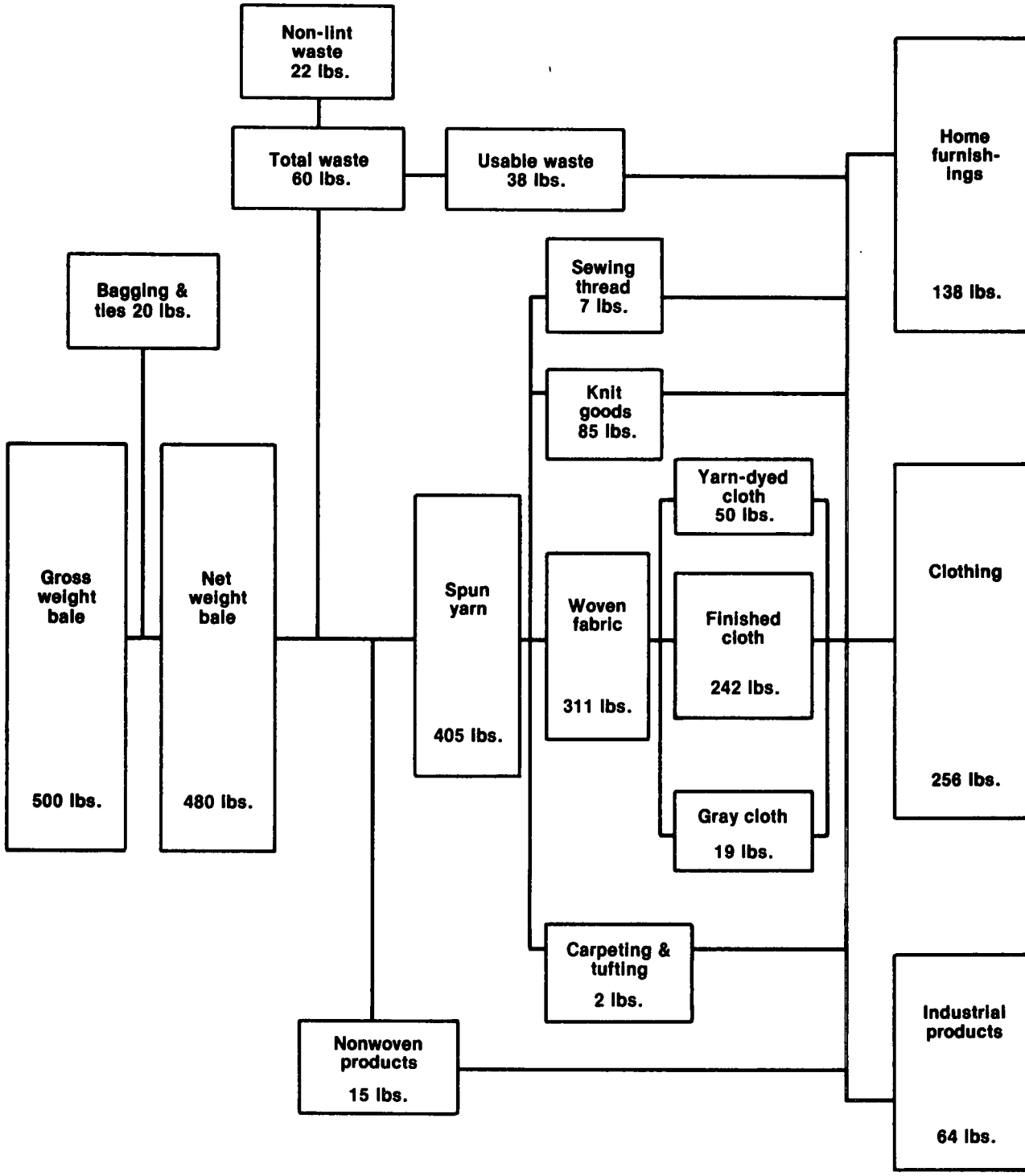
### *Changes in Exporting Countries*

The United States is the world's largest cotton exporter with a market share in 1986-87 of 27 percent. The U.S. share has varied substantially since 1960, ranging from 10 to 40 percent of world exports (see table 4). Much of the variation in market share is explained by relative prices for U.S. cotton and cotton from competing exporting countries. Abundant harvests in competing exporting countries cause a reduction in U.S. exports. Also, during the 1982/83 season, when U.S. prices fell to the loan rate, U.S. exports fell from 33 percent to 27 percent of world trade, even though U.S. ending stocks rose to 7.9 million bales.

The United States accounts for a high proportion of total imports of raw cotton by several countries, including Japan, Korea, Taiwan, Hong Kong, Indonesia, Thailand, and Canada (table 5). Japan was the largest single export market for the United States during 1984-87, followed closely by Korea. The United States holds the largest market shares of imports by Canada and Korea.

Figure 2

## Distribution of an average bale of U.S. cotton



During the 1950's and early 1960's, when U.S. price support rates were high relative to world prices, a payment-in-kind was used to promote exports, but it was discontinued in 1967. Such a program provides an indirect advantage to foreign textile manufacturers which compete with U.S. mills. During fiscal years 1985-87, about 950,000 bales a year were exported under a credit guarantee program. Although PL 480 exports were important in some earlier years, only about 50,000 bales each year were exported through PL 480 during 1985-87.

**Table 4—World cotton exports and market shares, 1960-87**

| Year | World exports | U.S. exports | Market shares: United States | USSR | Other exporters |
|---|---|---|---|---|---|
| | *Million bales* | | | *Percent* | |
| 1960 | 17.1 | 6.9 | 40.1 | 10.2 | 49.7 |
| 1965 | 16.9 | 3.0 | 17.0 | 13.2 | 68.9 |
| 1970 | 17.7 | 3.9 | 22.0 | 13.8 | 64.2 |
| 1975 | 19.1 | 3.3 | 7.4 | 20.5 | 62.1 |
| 1980 | 19.7 | 5.9 | 30.1 | 20.8 | 49.1 |
| 1981 | 20.2 | 6.6 | 32.6 | 21.3 | 46.1 |
| 1982 | 19.5 | 5.2 | 26.9 | 20.1 | 53.0 |
| 1983 | 19.2 | 6.8 | 35.8 | 18.5 | 45.7 |
| 1984 | 20.2 | 6.2 | 30.2 | 14.3 | 55.5 |
| 1985 | 20.2 | 2.0 | 9.6 | 15.5 | 74.9 |
| 1986 | 25.9 | 6.7 | 25.8 | 12.0 | 59.4 |
| 1987 | 23.5 | 6.6 | 27.9 | 14.5 | 57.6 |
| 1988 | 24.6 | 6.2 | 24.0 | 14.2 | 61.8 |

The United States imposes an annual import quota on raw cotton totaling 14.5 million pounds (about 30,240 bales) of short-staple cotton having a length of less than 1-1/8 inches, and a quota of 45.7 million pounds (about 95,118 bales) of long-staple cotton having a length of 1-1/8 or more. Raw cotton imports have not approached these quota limits in recent years, having averaged about 2,500 bales in 1986-87.

The United States will likely continue as the world's leading exporter of raw cotton in the near future, though its position has slipped somewhat since the early-1980's. Chief competitors and their 1987-88 export market shares are the Soviet Union (14.4 percent), Pakistan (11.6 percent), and China (7.9 percent). Among these countries, Pakistan has garnered an increasing share of world exports in recent years.

Other cotton exporters with a significant 1987-88 share of the world market include Australia (4.3 percent), Paraguay (3.3 percent), Sudan (2.9 percent), Argentina (1.9 percent), Brazil and Mexico (1.8 percent each), and Egypt (1.5 percent). Among these countries, the role of exports varies considerably with the first three exporting nearly all of their production and the last three exporting an average of only 20-40 percent. Individual variation of exports as a percentage of pro-

**Table 5—U.S. raw cotton exports of selected countries, August-July years 1983-88[1]**

| Destination | 1983/84 Exports | 1983/84 Market share | 1984/85 Exports | 1984/85 Market share | 1985/86 Exports | 1985/86 Market share | 1986/87 Exports | 1986/87 Market share | 1987/87- Exports | 1987/87- Market share |
|---|---|---|---|---|---|---|---|---|---|---|
| | *1,000 bales* | *Percent* | *1,000 bales* | *Percent* | *1,000 bales* | *Percent* | *1,000 bales* | *Percent* | *1,000 bales* | *Percent* |
| Japan | 1,709 | 51 | 1,464 | 48 | 520 | 17 | 1,723 | 48 | 1,569 | 46 |
| Korea | 1,269 | 79 | 1,257 | 77 | 513 | 31 | 1,330 | 72 | 1,450 | 74 |
| Taiwan | 495 | 42 | 513 | 45 | 46 | 3 | 907 | 41 | 424 | 27 |
| Hong Kong | 583 | 28 | 125 | 13 | 1 | 0 | 52 | 4 | 88 | 8 |
| Italy | 252 | 22 | 301 | 26 | 91 | 8 | 263 | 19 | 406 | 28 |
| France | 154 | 20 | 132 | 17 | 8 | 1 | 114 | 15 | 67 | 9 |
| Germany, Federal Republic of | 195 | 20 | 195 | 19 | 85 | 9 | 263 | 21 | 376 | 33 |
| Portugal | 69 | 10 | 80 | 12 | 7 | 1 | 76 | 10 | 58 | 7 |
| Indonesia | 320 | 63 | 258 | 43 | 105 | 15 | 324 | 41 | 287 | 33 |
| Thailand | 244 | 44 | 139 | 25 | 17 | 3 | 239 | 23 | 248 | 16 |
| Canada | 227 | 93 | 195 | 87 | 98 | 34 | 70 | 30 | 153 | 73 |
| China | 12 | 5 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 1,556 | | 1,550 | | 469 | | 1,324 | | 1,456 | |
| World | 6,786 | 35 | 6,215 | 31 | 1,960 | 10 | 6,685 | 26 | 6,582 | 28 |

[1]For each country, market share is the U.S. share of total cotton imports. For the world, market share is the U.S. percentage share of world exports.

duction is greatest for Argentina, which exported about 20 and 75 percent of its outturn in 1987 and 1988.

**World Textile Trade**

Much of the growth in world and U.S. cotton trade in the 1960's and 1970's was associated with the development of textile industries in Japan, Taiwan, Hong Kong, and South Korea. These countries, with their low labor costs, gained a competitive advantage on a global basis in the manufacture of labor-intensive textile products. However, economic growth in these countries has increased wage rates. From 1983-87, wage rates in Japan, Taiwan, Hong Kong, and South Korea increased 81, 89, 48, and 54 percent, respectively. A second tier of textile exporters has recently emerged, including China, Brazil, Pakistan, and India. These countries, all raw cotton producers, have begun to compete for textile markets in an effort to increase revenue through sale of value-added textile products. In 1987, U.S. textile workers received an average of $9.11 per hour, while workers in Taiwan, Hong Kong, and South Korea received $2.19, $2.19, and $1.48 per hour, respectively. While differences do not account for labor productivity differences, variable exchange rates, or differences in purchasing power, they give an indication of the advantage that lower wage countries have over the United States and Western Europe in textile production.

The Multifiber Arrangement (MFA) is a factor influencing textile trade and, by extension, world cotton trade. The MFA, negotiated under the auspices of the General Agreement on Tariffs and Trade (GATT) in 1974, is a set of complex export restrictions negotiated on a bilateral basis between developed-country textile importers and the major developing-country textile exporters. Import quotas negotiated under the MFA may have slowed the decline of textile and apparel mills in developed countries. In the U.S. textile industry, employment is estimated to decrease 1 percent for each 5-percent rise in the value of textile imports. The value of U.S. imports of textile products is estimated to have increased at about a 16-percent compound annual rate during 1978-86.

The quantity of U.S. cotton textile imports is highly influenced by domestic economic conditions and the international value of the U.S. dollar. For instance, a 1-percent improvement in the performance of the domestic economy is likely to raise cotton textile imports by 1.7 percent. Likewise, a 1-percent increase in the trade-weighted exchange value of the dollar is likely to result in a proportionate increase in cotton textile imports. Thus, as the U.S. economy strengthens (weakens), imports of cotton textile products will likely increase (decline).

The United States had bilateral trade agreements involving cotton textile imports with 40 countries in 1988, compared with 20 countries in 1983. In addition to the broader country coverage, the cotton category coverage is more comprehensive. In 1988, 14 of the 40 agreements covered all cotton imports, compared with 6 of the 20 agreements in 1983. Countries with comrehensive cotton category coverage accounted for 63 percent of cotton imports in 1987. Not all U.S. cotton textile imports in 1988 were charged against import quotas, while tariffs covered all textile imports. U.S. import tariffs on cotton yarn, woven cotton fabrics, and wearing apparel and accessories averaged 7.6, 9.2, and 20.3 percent, respectively, of customs value in 1988.

**Trends in Prices, Costs, and Returns**

Prices, costs, and returns for the cotton sector can be reported in various forms. With government programs, there is not just one price to consider but several prices. Likewise there are many ways to estimate costs and returns and different uses for each way. For example, estimates of marginal costs and returns are valuable for analysis of individual farms as well as certain industry analysis. Large cotton farms will usually have lower costs per acre than small cotton farms because fixed costs can be spread over more acres. Per acre costs of irrigated cotton are usually more than three times as high as nonirrigated cotton. And returns vary with yields, type of farm, and other factors. However, for this section, U.S. average prices, costs, and returns are used. Average costs and returns are the only national data available. Average costs are the most useful for most issues involving the overall condition of the industry and program effects.

***Prices***

Although U.S. cotton prices vary substantially from year to year, there was no significant upward trend in nominal prices from the mid-1940's through 1972 (table 6). Farm prices more than doubled in the 1970's, reaching a peak of 74.4 cents per pound in 1980. Prices then dropped below 60 cents per pound in 1981 and 1982 and again rose somewhat during the 1983 crop year due to the payment-in-kind program and drought. Prices fell to near 50 cents in 1986 as U.S. cotton became noncompetitive in world markets. The

**Table 6—Upland cotton farm prices, yields, and revenue, 1929-87**

| Crop year | Average farm price: Current dollars | Average farm price: 1982 dollars | Yield | Revenue per harvested acre |
|---|---|---|---|---|
| | *Cents per pound* | | *Pounds* | *1982 dollars* |
| 1929 | 6.8 | 115.1 | 164 | 188.71 |
| 1933 | 10.2 | 91.1 | 213 | 193.98 |
| 1940 | 9.8 | 75.4 | 252 | 189.97 |
| 1945 | 22.5 | 143.3 | 254 | 364.01 |
| 1950 | 39.9 | 166.9 | 269 | 449.08 |
| 1955 | 33.6 | 123.5 | 417 | 515.12 |
| 1960 | 31.3 | 101.3 | 446 | 451.77 |
| 1965 | 29.2 | 86.4 | 527 | 455.28 |
| 1970 | 22.8 | 54.3 | 439 | 238.31 |
| 1971 | 28.1 | 63.3 | 438 | 277.20 |
| 1972 | 27.2 | 58.5 | 480 | 280.77 |
| 1973 | 44.4 | 89.7 | 521 | 467.32 |
| 1974 | 42.7 | 79.1 | 441 | 348.72 |
| 1975 | 51.1 | 86.2 | 453 | 390.36 |
| 1976 | 63.8 | 101.1 | 464 | 469.15 |
| 1977 | 52.1 | 77.4 | 519 | 401.78 |
| 1978 | 63.8 | 88.4 | 419 | 370.25 |
| 1979 | 62.1 | 79.0 | 547 | 432.17 |
| 1980 | 74.4 | 86.8 | 402 | 348.99 |
| 1981 | 54.0 | 57.4 | 542 | 311.36 |
| 1982 | 59.1 | 59.1 | 589 | 348.10 |
| 1983 | 66.1 | 63.6 | 504 | 320.64 |
| 1984 | 58.7 | 54.5 | 600 | 327.02 |
| 1985 | 56.8 | 51.2 | 630 | 322.67 |
| 1986 | 51.5 | 45.2 | 552 | 249.59 |
| 1987 | 63.7 | 54.1 | 702 | 379.93 |
| 1988 | 54.8 | 45.3 | 616 | 278.98 |

marketing loan provision of the 1985 Food Security Act restored U.S. cotton's competitiveness. Exports and prices both rose.

Prices received by farmers from 1975-87 were above variable cash expenses but under total economic costs (fig. 3). Total economic cost is the breakeven longrun average price necessary to continue producing a crop. It includes returns to all factors of production including land. During the 1980's the target price was generally high enough to cover total economic costs. The loan rate generally stayed above variable cash expenses and below farm prices and well below total economic costs.

Cotton prices averaged 64 cents in 1987, but U.S. cotton again lost its competitiveness in world markets in 1988. This time it was due to procedures for calculating the adjusted world price (AWP) which reflect the true market differences in transportation costs. U.S. cotton prices in world markets were successfully undercut by competitors, causing U.S. exports to drop. In addition, the marketing loan was not sufficient to induce producers and merchants to sell cotton they were holding in storage because the cotton program allowed owners of cotton to hold stocks for up to 18 months with little or no storage or other holding costs and no downside price risk. The result was tight short-term supplies and rising prices even though stocks were growing and exports were down.

Cotton competes with manmade fibers for a share of the textile market. Through the 1970's, cotton's share of the market had been declining. Polyester, the major manmade fiber, was cheaper than cotton and offered mills a stronger fiber with consistent fiber qualities. When cotton prices fell in the early 1980's, cotton became cheaper than polyester (fig. 4) and the downward trend in the share of the market for cotton bottomed out. At the same time consumers began showing a preference for cotton clothing, helping to bring cotton's market share from a low of 29 percent to 34 percent in 1987, the highest level in more than a decade.

Cotton is the only agricultural commodity covered by specific legislation prohibiting price forecasting by the Federal Government. This restriction has existed since 1929.

### *Costs and Returns*

From 1980-86 the farm value of cotton was not enough to cover all production costs (fig. 5). However, when Government payments were included, cotton producers were able to earn a profit after paying all costs, including returns to land and unpaid family labor. Cotton producers had a good year in 1987 because prices increased enough so that all costs could be paid from the farm value of the crop and substantial Government payments added to producers' profits.

Yield changes are a key factor in unit costs of production. Yields in the mid-1960's were triple those of 1929-30. Productivity increases resulted in relatively high real (deflated) revenues per harvested acre from 1950 through 1965. Yields from 1965 to 1980 showed no obvious trend and real revenue per harvested acre generally declined as real prices weakened. Yields finally turned upward during the 1980's but stocks and supplies were high and real prices dropped, causing real

Figure 3
**U.S. cotton prices and costs**

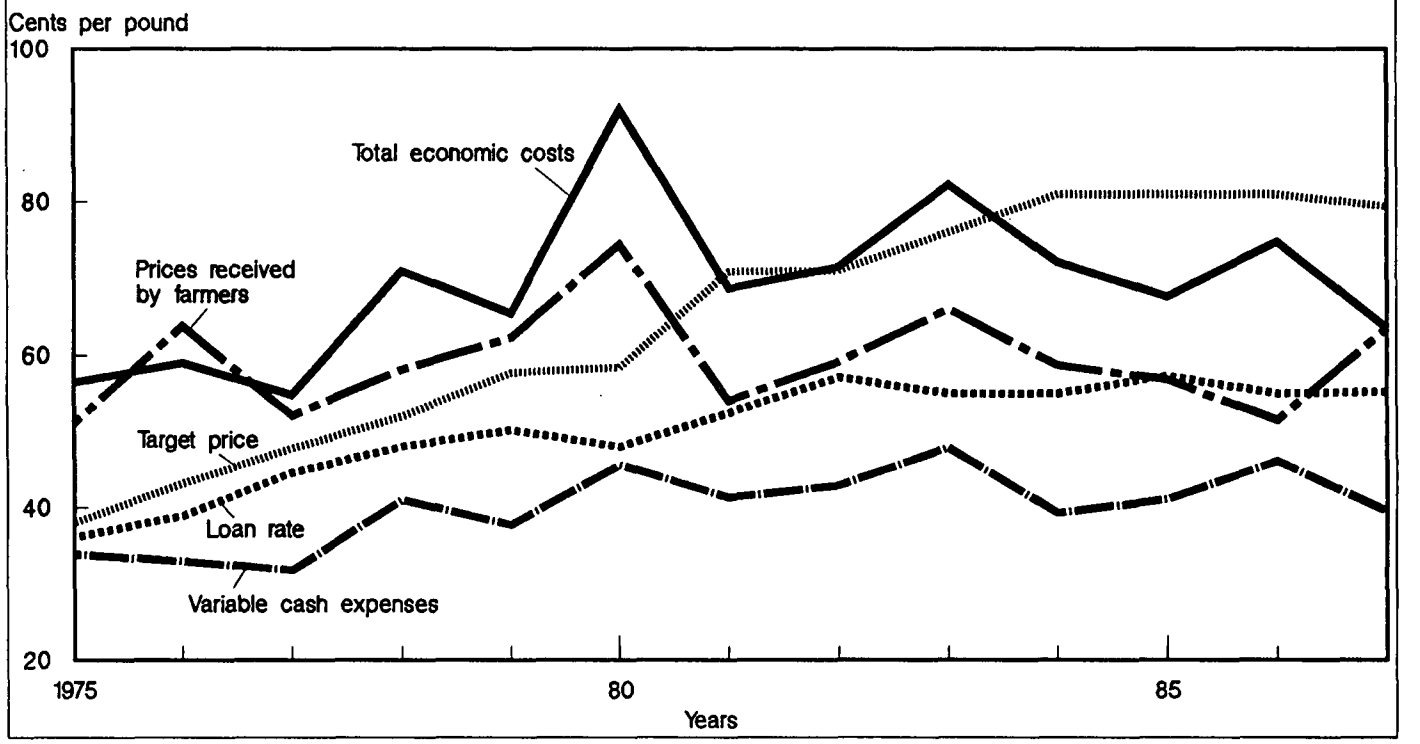



Figure 4
**U.S. raw-equivalent fiber prices**

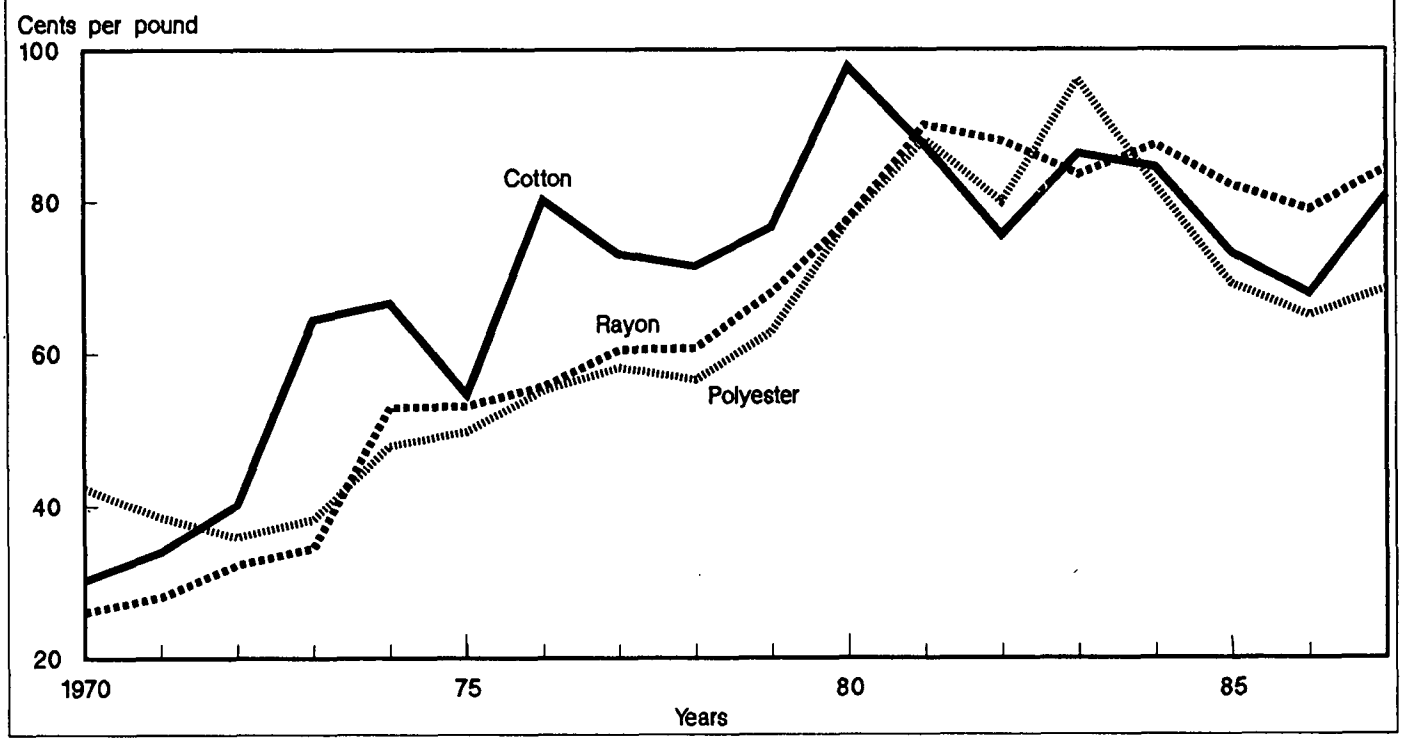
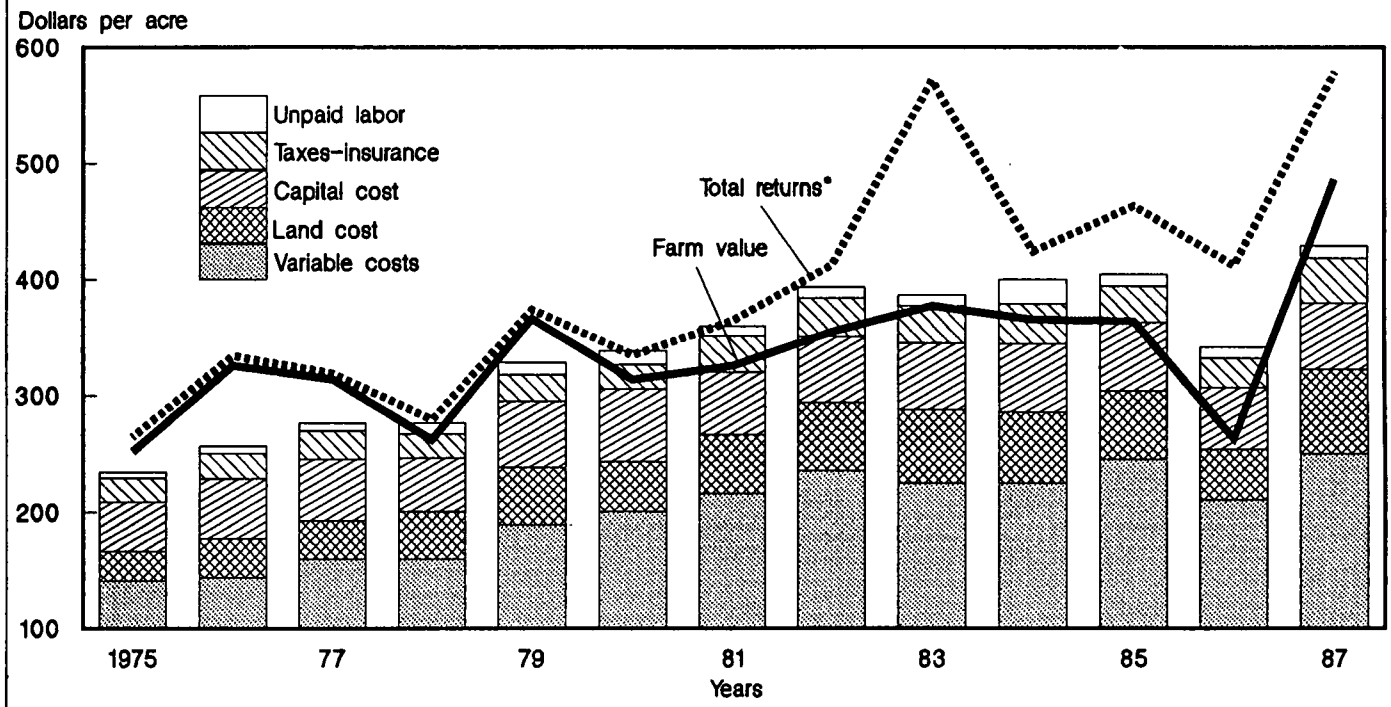


Figure 5
**U.S. cotton costs and returns**




* Includes Government payments.

revenue per harvested acre to decline even with higher per acre production (see table 6).

Compared with other types of farms, cotton farms were relatively profitable in 1987 (fig. 6). Cotton farms are defined as farms having at least 50 percent of harvested acreage or cash sales from cotton.

There has been an upward trend in the growth of the cotton sector as a whole (table 7). But total economic costs have also increased so that total income above economic costs shows little or no growth over time. Like most crops, real returns per unit of output show a downward trend. As a result, farm costs of cotton products continue to decline and consumer costs decline from what they would be otherwise.

## History of Cotton Programs

### Early Programs

The decline in the economic conditions of farmers, especially cotton farmers, after World War I led to public discussion of possible programs to stabilize commodity prices and increase farm income. Farm leaders had been advising farmers to control production on a voluntary basis as a means of stabilizing market prices.

The failure of those efforts to affect the acreage of crops in oversupply and mounting pressure for legislation to cope with a depressed farm economy led to enactment of the Agricultural Marketing Act of 1929. This act created the Federal Farm Board, which made loans to marketing cooperatives for the purchase and storage of surplus commodities, including cotton. This program failed to achieve its objectives of stabilizing prices or increasing farm income. The failure was due in part to the absence of an effective program to control production, but more importantly to declining demand for cotton and other farm products during the depression. This experience led to the enactment of the Agricultural Adjustment Act of 1933, a comprehensive program aimed at controlling production and increasing prices of designated "basic" commodities, including cotton. One of the major goals of the act was to restore farm purchasing power of agricultural commodities to the 1910-14 average level. This concept later became known as "parity" which was translated into parity prices for each of the "basic" commodities. The concept was used to establish minimum levels of price support through the mid-1960's for cotton. Parity prices were based on a rigid historical formula and

Figure 6
**U.S. farm income by farm type, 1987**

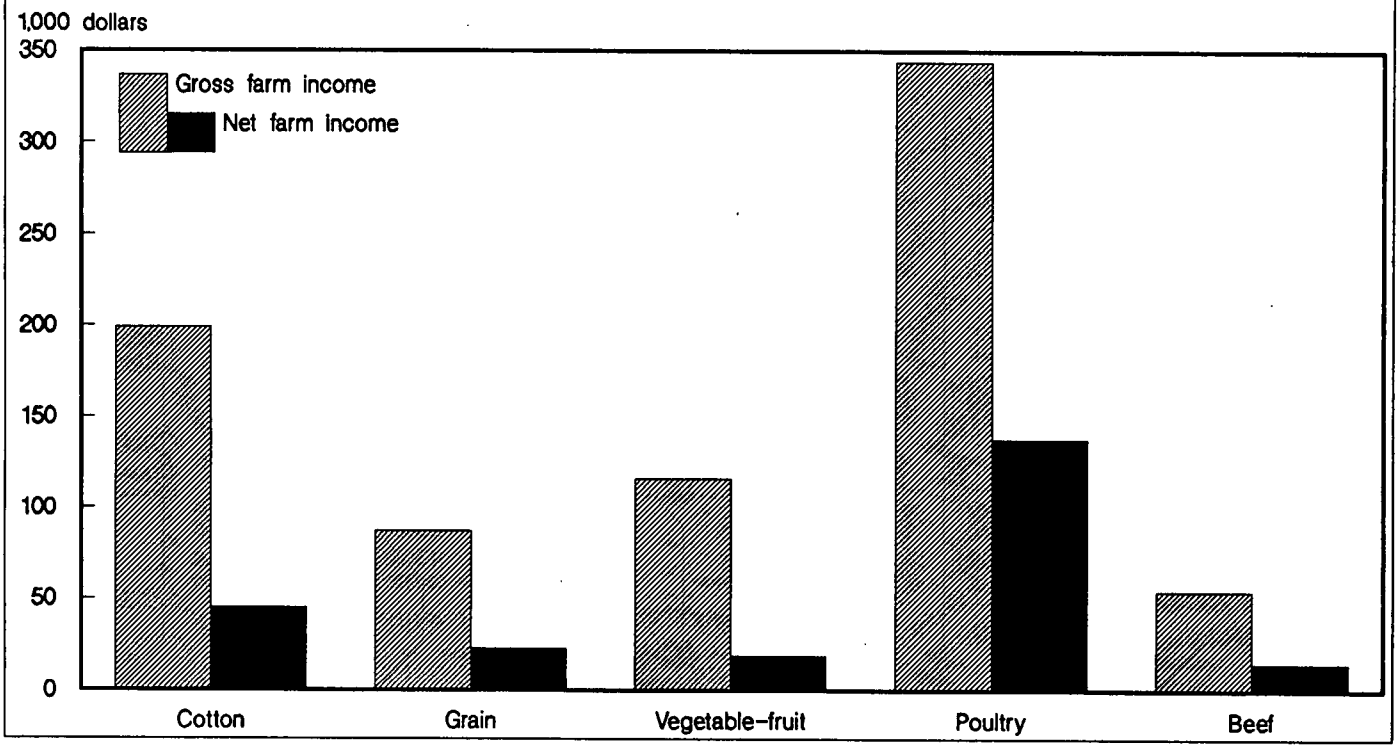



**Table 7—Cotton sector costs and returns, 1975-87[1]**

| Crop year | Farm value[2] | Direct payments[3] | Total income | Total cash[4] expenses | Total economic costs[5] | Returns above total economic costs: Farm value | Total income: Total | Total income: Nominal | Total income: Real[6] |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Million dollars* | | | | *Cents per pound* | |
| 1975 | 3,375 | 118 | 2,493 | 1,677 | 2,206 | 168 | 286 | 7.31 | 12.27 |
| 1976 | 3,776 | 98 | 3,874 | 2,109 | 2,974 | 801 | 899 | 17.84 | 28.27 |
| 1977 | 4,273 | 69 | 4,342 | 2,732 | 3,765 | 508 | 576 | 8.39 | 12.47 |
| 1978 | 3,488 | 228 | 3,716 | 2,626 | 3,681 | -193 | 35 | .68 | .94 |
| 1979 | 5,083 | 108 | 5,191 | 3,194 | 4,562 | 520 | 628 | 9.01 | 11.46 |
| 1980 | 4,538 | 302 | 4,840 | 3,490 | 4,890 | -352 | -51 | -.96 | -1.12 |
| 1981 | 4,646 | 550 | 5,196 | 4,281 | 5,134 | -487 | 62 | .83 | .88 |
| 1982 | 3,996 | 654 | 4,650 | 3,652 | 4,436 | -441 | 216 | 3.43 | 3.43 |
| 1983 | 2,965 | 1,528 | 4,493 | 2,455 | 3,042 | -77 | 1,451 | 39.26 | 37.79 |
| 1984 | 4,041 | 665 | 4,706 | 3,483 | 4,427 | -386 | 279 | 4.39 | 4.08 |
| 1985 | 3,857 | 1,056 | 4,913 | 3,425 | 4,288 | -430 | 625 | 9.86 | 8.89 |
| 1986 | 2,614 | 1,482 | 4,096 | 2,683 | 3,396 | -782 | 700 | 15.43 | 13.55 |
| 1987 | 4,998 | 951 | 5,949 | 3,593 | 4,418 | 580 | 1,531 | 21.93 | 18.63 |

[1]Costs are from ERS Cost of Production series. Acreage and payments from Commodity Fact Sheets, published by the Agricultural Stabilization and Conservation Service, USDA.
[2]Total gross value (including cotton seed) per planted acre times planted acres.
[3]The sum of deficiency, diversion, and disaster payments to producers. Loan value of payment-in-kind (4.3 mil. bales @ $0.53 per lb.) is included for 1983.
[4]Includes variable cash expenses, general farm overhead, taxes and insurance, interest on operating loan, and interest on real estate.
[5]Includes variable cash expenses, general farm overhead, taxes and insurance, capital replacement, and allocated returns to operating capital, nonland capital, land, and unpaid labor.
[6]Based on GNP implicit price deflator (1982 = 100).

failed to reflect changing market conditions and technological advances.

Production control was a primary objective of the Agricultural Act of 1933 and subsequent legislation. Farmers could take land out of production in return for benefit payments. In response to very low cotton prices received by farmers in 1932 and an abnormally high carryover, a cotton plow-up campaign in 1933 successfully eliminated about 10 million acres, or one-fourth of the growing crop. Growers received cash payments for their participation in the program. However, before the 1933 crop could be harvested, the deteriorating financial condition of cotton farmers led them to demand price supports. In response, a nonrecourse loan of 10 cents a pound was authorized on the 1933 crop. The term "nonrecourse" means that the producer may pay back the full dollar amount of the loan, or alternatively, deliver the stored cotton to the Commodity Credit Corporation (CCC). Such delivery constitutes payment of the price support loan in full, regardless of the current market value of cotton.

Marketing quotas were legislated in 1934 to prevent nonparticipants in the acreage control program from sharing in its financial benefits. The quotas restricted the quantity of cotton that each producer could sell without paying a penalty tax. Marketing quotas were a longstanding provision of subsequent cotton programs, ending in 1970.

The production control and financing features of the 1933 Act were declared unconstitutional by the Supreme Court in 1936. This action was followed by enactment of the Soil Conservation and Domestic Allotment Act in 1936, which provided for payments to farmers who agreed to adopt soil-building practices and shift land from "soil-depleting" surplus crops such as cotton and wheat to "soil-conserving" crops such as legumes and grasses. The soil-conserving payments in the 1936 Act failed to bring the desired cotton crop reduction. Harvested acreage in 1937 climbed to 33.6 million acres, compared with an average of about 28 million acres each year from 1933 through 1936.

Mounting crop surpluses and declining farm prices led to the Agricultural Adjustment Act of 1938. This act provided for mandatory price support loans and marketing quotas keyed to acreage allotments. The latter provision was intended to keep production in balance with market needs. Acreage allotments and marketing quotas were used for cotton from 1938 to 1942. The acreage planted to cotton declined to less than 25 million acres under this program, but there was not a comparable decline in production because of increasing yields.

Cotton acreage allotments were not in effect during 1943-49 because of the need to expand production during and following World War II. However, cotton price supports ranged up to 95 percent of parity during these years. Cotton acreage declined during the war and then expanded slowly, reaching 28.3 million acres by 1949, which was over 17 percent above the 1938-42 average. The anticipation of a return to acreage allotments in 1950 may have accounted for part of the large acreage in 1949.

The Agricultural Act of 1948 provided for mandatory price support for cotton, at 90 percent of parity if producers approved marketing quotas. Subsequent legislation extended this level of support through the 1954 crop.

Cotton acreage dropped about 35 percent in 1950 with the return of acreage allotments and marketing quotas. Production restrictions were again removed during 1951-53 because of the Korean War, and both acreage and production increased substantially. Production reached 16.5 million bales in 1953, a level not exceeded since then (fig. 7).

Increased production and stocks during 1950-53 prompted the renewal of allotments and marketing quotas under the Agricultural Act of 1954. Cotton was under marketing quotas continuously from 1954 through 1970. Under the 1954 Act and subsequent programs, cotton acreage declined from the 1951-53 average of 25.7 million acres to 18.1 million acres in 1954-55 and 13.7 million acres during the soil bank years in 1956-58. The soil bank was established by the Agricultural Act of 1956 to (1) reduce the amount of land planted to allotment crops and (2) provide for long-term retirement of cropland to conservation uses. The soil bank program idled acreage, but in relative terms, the reduction in capacity to produce was small. A major objection to the program was that communities were disrupted when many farmers placed whole farms in the conservation reserve. Yields continued to increase. Over the next 7 years (1959-65), cotton acreage averaged 14.8 million acres, and the accumulation of cotton stocks was substantial. With the exception of a few years, cotton prices received by farmers remained close to the loan level (table 8). Despite marketing quotas, supplies continued to increase because the allotment level had been reduced to the minimum allowed by legislation, leaving program administrators with no further allotment reduction discretion.

## Cotton Programs in the 1960's

In the late 1950's and early 1960's, policymakers realized that surpluses were mounting and existing legislation provided no effective provision to deal with them. Stocks peaked at nearly 17 million bales at the end of the 1965 crop year (see fig. 7), which exceeded total use that year by 4.5 million bales. Legislated minimum support prices and allotments, particularly for wheat and cotton, in conjunction with increasing yields insulated producers from the market. Even so, individual producers were dissatisfied because the allotment rigidities were preventing desired production shifts among crops in which they had a comparative advantage.

The Cotton-Wheat Act of 1964 authorized the Secretary of Agriculture to make payments to domestic handlers or textile mills in order to bring the price of cotton used in the United States down to the export price. This essentially ended the two-price system that had been in effect since 1956. Also, a domestic cotton allotment, smaller than the regular allotment, was authorized for 1964 and 1965. Producers who planted within the domestic allotment received a higher support through a direct price support payment. This act had two elements common to attempts to deal with surpluses: demand enhancement and voluntary acreage reduction. The 1964 Act was the beginning of voluntary program for reducing cotton production.

The Food and Agriculture Act of 1965 was a major piece of farm program legislation that included dairy, wheat, feed grains, and cotton. The act also established a cropland adjustment program. The legislation covered 4 years, 1966-69, and was later extended to 1970. This act was more market oriented, with price supports for all of the covered commodities except dairy set below world market prices. The market price of cotton was supported at 90 percent of estimated world price levels. Incomes of cotton farmers were maintained through payments based on the extent of participation in an acreage reduction program. A minimum acreage reduction of 12.5 percent of the cotton acreage allotment was required of participants. Small farms had special provisions. For the first time, sale and lease of allotments within a State were permitted. Planted cotton acreage dropped from 14.1 million acres in 1965 to 10.3 million in 1966. The price support loan dropped from 29 to 21 cents. However, that reduction was offset by a price support payment (table 9). Starting in 1966, cotton producers joined wheat and feed grain producers in diverting cropland acreage to approved conserving uses. Cotton production was substantially reduced during 1966-68 as a result of

Figure 7
**U.S. cotton production and carryover**

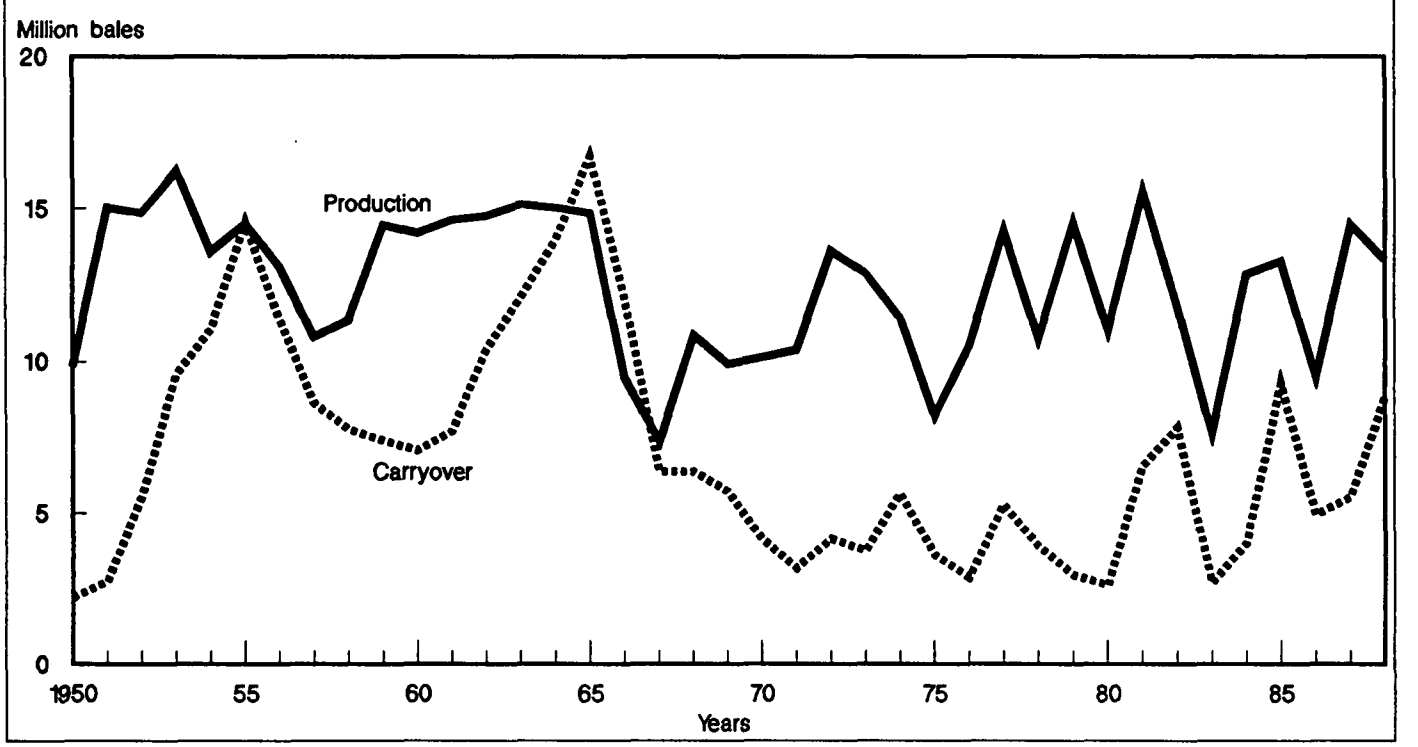


**Table 8—Average price support levels and average prices received by farmers for upland cotton under early agricultural programs, 1940-63**

| Year | Level of support: Percentage of parity[1] | Level of support: Price support loan[2] | Season-average price received by farmers (gross weight) |
|---|---|---|---|
| | *Percent* | *Cents per pound* | |
| 1940 | 571 | 9.40 | 9.83 |
| 1941 | 85 | 14.42 | 16.95 |
| 1942 | 90 | 17.42 | 18.90 |
| 1943 | 90 | 19.51 | 19.76 |
| 1944 | 95 | 21.33 | 20.72 |
| 1945 | 92.5 | 21.39 | 22.51 |
| 1946 | 92.5 | 24.68 | 32.63 |
| 1947 | 92.5 | 28.19 | 31.92 |
| 1948 | 92.5 | 31.49 | 30.38 |
| 1949 | 90 | 30.03 | 28.57 |
| 1950 | 90 | 30.25 | 39.90 |
| 1951 | 90 | 32.36 | 37.69 |
| 1952 | 90 | 32.41 | 34.17 |
| 1953 | 90 | 33.50 | 32.10 |
| 1954 | 90 | 34.03 | 33.52 |
| 1955 | 90 | 34.55 | 32.27 |
| 1956 | 78 | 32.74 | 31.63 |
| 1957 | 81 | 32.31 | 29.46 |
| 1958 | 80 | 35.08 | 33.09 |
| 1959[3] | 80 | 34.10 | 31.56 |
| | 65 | 28.40 | |
| 1960[3] | 75 | 32.42 | 30.08 |
| | 60 | 26.63 | |
| 1961 | 82 | 33.04 | 32.80 |
| 1962 | 79 | 32.47 | 31.74 |
| 1963 | 79 | 32.47 | 32.02 |

[1]Reflects average level. In 1944 and 1945, the CCC purchased cotton at 100 percent of parity.

[2]Prior to 1961, support was based on 7/8-inch Middling cotton, but all support prices have been converted to Middling 1-inch to make them comparable. Reported on gross weight basis.

[3]In 1959 and 1960, producers could elect to (a) plant within their regular allotment and receive support at not less than 80 percent of parity for 1959 and 75 percent of parity for 1960, or (b) increase their acreage by as much as 40 percent over their allotment and receive support at a level of 15 percent of parity less than that of choice (a).

attractive diversion payments and low yields in 1966 and 1967.

By the end of the 1970 season, the huge CCC inventory of cotton was gone. The voluntary programs to reduce acreage had met the objective of reducing or eliminating surpluses, but they had raised a new issue: the direct Treasury cost of programs and the amount of payments going to large producers. Large cotton producers, particularly, were singled out as recipients of large annual payments.

### Cotton Programs in the 1970's

The Agricultural Act of 1970 established a voluntary program for cotton, as marketing quotas were suspended for 3 years. The act also provided for a cropland set-aside program in which diversion of cropland to conserving uses could not exceed 28 percent of the farm's base acreage allotment. The set-aside payment to participating farmers was specified as the difference between the higher of 65 percent of parity or 35 cents a pound, and the average market price for the first 5 months of the marketing year. This payment, however, could not be less than 15 cents per pound. The 1970 Act put a separate $55,000 annual limit on Government payments to producers of upland cotton, wheat, and feed grains. The limit applied to all direct payments but did not include CCC loans or purchases. The loan rate was established at 90 percent of the average world price for the previous 2 years.

The provisions of the 1970 Act continued to recognize the importance of the world market price through the way the loan rate was set. The set-aside concept gave producers a wider latitude in crop selection and mix because there was no restriction on the crop mix on remaining planted acres. However, cotton producers would lose some allotment if less than 90 percent of their farm allotment were planted to cotton.

The issue of large payments was addressed by the $55,000 payment limitation. The limit had little impact on total payments because large producers often divided ownership of their units, which allowed a unit to have multiple recipients.

A set-aside program was in effect in 1971 and 1972. The 2-million-acre set-aside was half of the acreage diverted in the 1966-68 period. Planted acreage reached 14 million acres in 1972 for the first time since 1965. The increase in acreage was a result of higher price expectations at planting time and the elimination of planting restrictions. Unlike previous programs, the farm cotton allotment in 1971-73 did not limit the acreage of cotton that a participant could plant. However, set-aside payments were based on production from acreage planted within the base acreage allotment rather than the total acreage planted.

By 1973, the worldwide demand for American farm products was at a high level due to world crop shortages, devaluation of the dollar, and generally favorable

**Table 9—Average price support levels and average prices received by farmers for upland cotton, 1964-73**

| Year | Level of support | | | |
|---|---|---|---|---|
| | Price support loan[1] | Price support payment[2] | Total support or guarantee[3] | Season-average price received by farmers[4] |
| | *Cents per pound* | | | |
| 1964 | 30.00 | 3.50 | 33.50 | 29.62 |
| 1965 | 29.00 | 4.35 | 33.35 | 28.03 |
| 1966[5] | 21.00 | 9.42 | 30.42 | 20.64 |
| 1967 | 20.25 | 11.53 | 31.78 | 25.39 |
| 1968 | 20.25 | 12.24 | 32.49 | 22.02 |
| 1969 | 20.25 | 14.73 | 34.98 | 20.94 |
| 1970 | 20.25 | 16.80 | 37.05 | 21.86 |
| 1971 | 19.50 | 15.00 | 35.00 | 28.07 |
| 1972 | 19.50 | 15.00 | 35.85 | 27.20 |
| 1973 | 19.50 | 15.00 | 41.25 | 44.40 |

[1]For Middling 1-inch cotton. Gross weight basis through 1970; net weight thereafter.
[2]Available on domestic allotment for 1964-70 crops; for 1971-73, represents minimum payment rate on full base acreage allotment.
[3]For 1964-70 crops, represents total support on domestic allotment; for 1971-73 crops, the final payment, together with the national average market price, had to equal the higher of 35 cents or 65 percent of parity, but not be less than 15 cents a pound.
[4]Price supports and prices received were based on gross weight of cotton and wrapping prior to 1971; all quotations from 1971 to date are net weight.
[5]For 1966 and subsequent years, loan rate set at 90 percent of average price of U.S. cotton in world markets during a specified period.

worldwide economic growth. Stocks that had built to surplus levels in the 1950's and 1960's were greatly reduced. The Agriculture and Consumer Protection Act of 1973 was debated and passed in a far different setting than the acts since 1954. Many agricultural interests felt the setting had changed from a situation of chronic surpluses and income problems to a situation where the Government could minimize its role and the attendant cost for crops.

A major feature of the 1973 Act was the target price concept. Target prices were provided in recognition that agriculture faces weather and market extremes which can result in low incomes, and that income support should not affect the market price. Direct payments would be made only if market prices fell below target price levels. The payment rate would vary by the actual amount the market price was below the target price during a specified period of the marketing year. Payment rates could not exceed the difference between target prices and the loan rate. The loan rate for upland cotton was established to reflect 90 percent of the average price of American cotton in world markets for the preceding 3-year period. The act specified target price levels for 1974 and 1975 and provided a specific adjustment formula based on the index of prices paid for farm inputs and changes in productivity measured by yields for 1976 and 1977. The use of set-aside was authorized but not required during the period covered by the 1973 Act. The payment limit was lowered to $20,000 per person and applied to payments for wheat, feed grains, and cotton combined.

Another new concept introduced in the 1973 Act was disaster payments. Participating producers in the wheat, feed grain, and cotton programs who were prevented from planting any portion of allotments or who suffered low yields due to natural disaster received a payment based on a percentage of the target level of support. Disaster payments were made for each of the 1974-82 crop years (shown by crop year in table 12 and by fiscal year in app. table 4).

The target price, set-aside, and disaster programs applied to national base acreage allotments that were determined and apportioned by the Secretary of Agriculture. Additional plantings were not eligible for support, but no penalties were imposed.

The increase in 1974 acreage over 1973 resulted largely from attractive prices for cotton (table 10). However, a significant drop occurred in 1975 cotton acreage, chiefly due to a strong cost-price squeeze and significant shifts from cotton to soybeans in the Delta and Southeast. No deficiency payments were made through 1977, as the average market price received exceeded the target price.

**Table 10—Average price support levels and season-average prices received by farmers for upland cotton, 1974-88**

| Year | Loan rate[1] | Target price | Season-average price received by farmers (net weight basis) |
|---|---|---|---|
| | | *Cents per pound* | |
| 1974 | 27.06 | 38.00 | 42.7 |
| 1975 | 36.12 | 38.00 | 51.1 |
| 1976 | 38.92 | 43.20 | 63.8 |
| 1977 | 44.63 | 47.80 | 52.1 |
| 1978 | 48.00 | 52.00 | 58.1 |
| 1979 | 50.23 | 57.70 | 62.3 |
| 1980 | 48.00 | 58.40 | 74.4 |
| 1981 | 52.46 | 70.87 | 54.0 |
| 1982 | 57.08 | 71.00 | 59.5 |
| 1983 | 55.00 | 76.00 | 65.3 |
| 1984 | 55.00 | 81.00 | 58.7 |
| 1985 | 57.30 | 81.00 | 56.8 |
| 1986 | 55.00 | 81.00 | 51.5 |
| 1987 | 52.25 | 79.40 | 63.7 |
| 1988 | 51.80 | 75.90 | 54.8 |
| 1989 | 50.00 | 73.40 | [2] |

[1]Base loan rates for SLM 1-1/16-inch cotton (micronaire 3.5-4.9) at average location, net weight.
[2]USDA is prohibited by law from publishing cotton price forecasts.

Falling farm income dominated discussions on whether to extend or replace 1973 farm legislation. Stocks were far below those of the early 1960's, but commodity prices had not kept pace with production costs, which resulted in a cost-price squeeze. The farm income issue focused on the price and income support structure. The basic rationale of the 1973 Act had been to protect farm income, yet farm income had fallen in 1976 and 1977 without triggering any large-scale support. No deficiency payments had been paid for cotton, but there had been some disaster payments. Export markets continued strong, so there was still optimism about demand.

The response as embodied in the Food and Agriculture Act of 1977 was to set target prices on the basis of cost of production. Cost of production was used as a guideline in setting the target price levels specified in the 1977 Act, and a formula using cost estimates was defined for subsequent adjustments.

The loan rate continued to be based on a percentage of past market prices. The formula was expanded to use the lower of 85 percent of a preceding 3-year average of prices at domestic locations or 90 percent of the average price of specified classes of cotton in northern Europe during the 15-week period beginning July 1 of the year in which the loan level was announced. A minimum loan rate of 48 cents a pound was specified.

Another significant change was to base the target price payment calculation on acreage actually planted rather than on an historical allotment. The payment could be reduced by a national allocation factor if producers in the aggregate exceeded an announced national program acreage. Overall, the 1977 Act was the second attempt at establishing a price and income safety net for producers that would be effective without impinging on the desired market orientation. No deficiency payments were made through 1980, as market prices exceeded target prices.

The Food and Agriculture Act of 1977 facilitated a shift of cotton production to the lower cost regions of the West and Southwest since benefits were based on recent plantings rather than on an historically based allotment. This encouraged the movement of acreage to more efficient producers and to regions where cotton held a comparative advantage. Cotton acreage and production increased significantly during 1978-81. The 1978-81 average acreage planted to cotton increased to 14.1 million acres from the 12.1-million average for 1974-77.

### Cotton Programs In the Early 1980's

The Agriculture and Food Act of 1981 was also debated and developed under a situation of falling farm income. Net farm income had increased in 1978 and 1979, the first 2 years under the 1977 Act, but then began to decline again. The focus of the 1981 debate was on the price and income supports and the provisions or mechanisms affecting their adjustment. The cost-of-production adjustment formula for target prices had not worked satisfactorily. It was based on an historical moving average of per acre costs and actual yields in estimating unit costs. The formula was applied during a period of increasing inflation with the result that adjustments lagged behind actual conditions. Production costs reflect changes in production inputs and their prices and do not accurately track changing market conditions.

There was general optimism during the legislation development period that export demand would remain strong. The 1981 Act specified minimum target prices at successively higher levels for all 4 years of the legislation. The Secretary was given authority to adjust target prices based on a number of factors, including