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Cotton Backgrounder

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Abstract

U.S. cotton growers, like producers of other agricultural commodities in recent years, have confronted pressures from market forces and the impacts of policy developments, both domestic and international. Most notably, the ending of the Multifiber Arrangement (MFA) sent a ripple effect throughout the global cotton industry. While adjustments in the textile and apparel sectors of many countries, including the United States, continue to evolve, dramatic changes have already been seen for some. World cotton mill use has accelerated along with economic growth since 1999, particularly in China, and U.S. cotton producers have benefited as foreign import demand has reached new heights. Government payments contribute a considerable portion of total revenue to the cotton sector, and adjustments to this program or any other commodity program in the 2007 farm legislation will be driven by factors such as domestic market conditions, multilateral trade negotiations, and the Federal budget deficit. This report provides background information related to cotton and textiles for the 2007 farm bill discussions.

Keywords: Cotton, supply, demand, trade, textiles, apparel, Multifiber Arrangement, farm policy, government support programs.

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Introduction

Cotton is the single most important textile fiber in the world, accounting for about 40 percent of all fibers produced. On average, the United States produces 20 percent of the global cotton production, and is the leading supplier in the international market. However, the U.S. cotton sector has faced a number of challenges as it shifts from a domestic-oriented market to one focused largely on the global marketplace. Domestic mill demand has declined significantly from only a decade ago as competition from imported textile and apparel products has risen dramatically. Meanwhile, export demand has increased rapidly with the recent expansion of global textile production.

U.S. cotton production reached consecutive records during the 2004 and 2005 seasons, with rising global cotton demand providing a home for much of the increased output. However, the growing use of better crop production technologies overseas may narrow the gap between foreign production and mill use, constraining growth in foreign import demand and U.S. cotton exports. Meanwhile, debate over trade policy and the sustainability of current farm programs are a source of uncertainty for U.S. agricultural commodities in general and the cotton sector in particular.

This report, part of a series of ERS background reports on various commodities, surveys the cotton environment leading up to the congressional debate over the 2007 farm bill. The report analyzes the competition between crops for domestic farmland, and the international supply and demand for cotton products. Also covered are domestic and trade policy, farm program costs, and operating and financial characteristics of U.S. farms producing cotton.

The Changing Global Cotton Market

World cotton production and mill use have soared to record highs in recent years. As yield-enhancing technology has helped reduce the cost of producing cotton around the globe, rising petroleum prices have further shifted relative fiber prices to favor cotton versus polyester. With yield prospects higher than in the past, farmers around the world have been more willing to devote area to cotton, further easing the ability of the global cotton sector to meet growing world demand for textiles. Robust global economic growth, particularly in developing Asian markets, combined with a steadier share for cotton in world fiber use, has boosted gains in cotton mill use to extraordinary rates in recent years (appendix table 1).

New Technology Attracting Cotton Acreage

Area planted globally to cotton remained above 85 million acres (34 million hectares) for the third consecutive year in 2006, its strongest performance in over 75 years. Around the world, new technology has made cotton more attractive to farmers in many countries, while policy reforms in other countries have increased farmers' willingness to plant cotton. Outside the United States, the spread of Bt cotton has recently revolutionized India's cotton sector just as China's adoption has run its course. The cost savings of Bt cotton brought millions of hectares back into cotton production in eastern China, and has also helped India's cotton area rebound by more than 1 million hectares. Bt cotton has also been adopted in smaller producing countries like Australia, Argentina, Mexico, and South Africa.¹

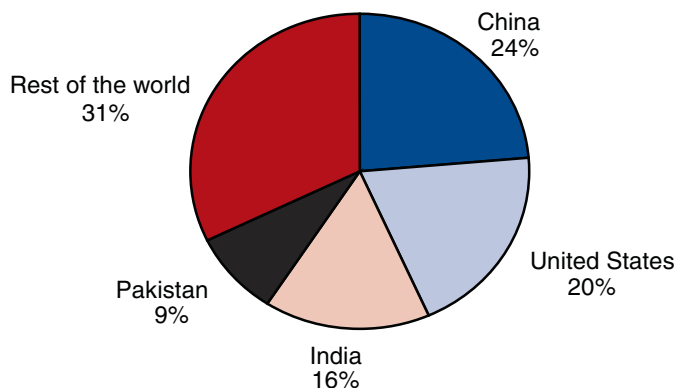
Sub-Saharan Africa's cotton area rose strongly after the 1994 devaluation of the Communauté française d'Afrique (CFA) franc. More recently, reforms in non-franc zone countries have also been important, and area in the region overall has risen more than 1 million hectares since 2000 (Meyer et al., 2005). Developments in Central Asia's cotton sector have been less dramatic, although yields and area in the region have been rising recently for the first time since the collapse of the former Soviet Union. While steady production gains by sub-Saharan Africa briefly made that region the largest export competitor for the United States in 2003, Central Asia's rebound has kept the two regions' exports essentially equal since then.

With technology sustaining global cotton area and improving yields, world cotton production has reached new heights. During the latter half of the 1990s, global production averaged 89 million bales (1 bale = 480 pounds). However, during the first half of the 2000s, the average was nearly 15 million bales higher at 103 million—including a record of 120 million bales in 2004/05. The world's four largest cotton-producing countries are China, the United States, India, and Pakistan, together accounting for nearly 70 percent of world production over the last 3 years (fig. 1). Other major cotton producers include Uzbekistan, Brazil, and Turkey.

¹For more information on Bt cotton in India, see Landes et al., 2005. For more information about Bt cotton in other countries, see James, 2005.

Figure 1

World cotton production, 2003-05



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution Database.

Global Economic Growth Spurs Cotton Use

World GDP has been expanding at an above-average rate since 2002, averaging 4.4 percent annually according to the International Monetary Fund, compared with a 1970-99 average of 3.6 percent. Furthermore, these gains have been concentrated in developing Asia, where lower per capita incomes mean a higher income elasticity of clothing demand. As a result, growth in total world fiber use has surged well above its longrun 2.9-percent annual growth rate, averaging 5.4 percent per year since 2002.² Cotton mill use has been growing as much as 11 percent annually during this time, as a robust global economy and favorable relative fiber prices came together to a greater extent than at any time in the last 20 years. Between 1999/2000 and 2005/06, world cotton mill use rose 25 million bales to nearly 116 million.

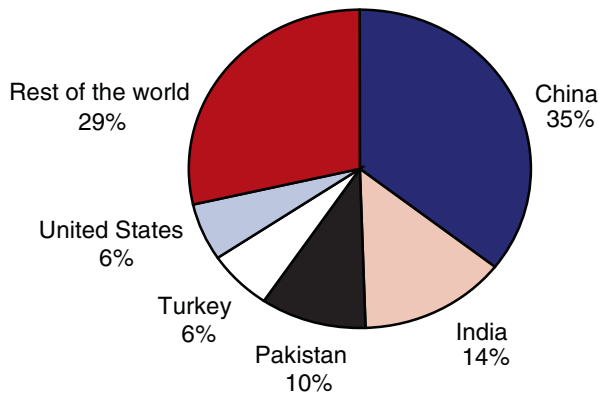
While virtually every country has a textile industry that meets at least part of its clothing demand, some have a strong export focus as well. Accordingly, the geographic distribution of gains in industrial cotton demand for textile production since 1999/2000 has been uneven as textile exporters have come to account for a larger share of global textile production. The world's three largest cotton-consuming countries—China, India, and Pakistan—accounted for 60 percent of global cotton mill demand over the last 3 years (fig. 2). China's increased mill use dwarfs that of any other country, with a 25-million-bale increase between 1999/2000 and 2005/06. Pakistan and India have seen their mill use rise by 4 and 3 million bales in that time. Turkey's mill demand is more than 1 million bales higher, while Bangladesh and Southeast Asia are each about 1 million bales higher. Some smaller countries—including Syria, Egypt, and Argentina—also increased use in recent years.

In addition to growing textile exports, increased domestic demand for clothing is driving increased cotton mill use in most of these regions. Areas with declining mill demand, on the other hand, have been largely driven by developments in textile trade rather than domestic demand. While domestic demand for textiles in the United States has tended to rise, it has not been growing as strongly as in developing Asia. However, U.S. mill use of cotton has fallen as imported cotton products increasingly supplant goods produced

²See MacDonald and Vollrath, 2005, for more details on the factors driving global fiber and cotton consumption.

Figure 2

World cotton mill use, 2003-05



Source: USDA, Foreign Agricultural Service, Production, Supply, and Distribution Database.

in North America. Lower industrial mill use of cotton has also occurred in the EU, Russia, Mexico, Japan, and South Korea. Textile trade reforms, like the end of the Multifiber Arrangement (MFA) quotas in December 2004, account for some of this shift in cotton mill demand, but the trend is longstanding.

Trade's Rising Importance

With cotton mill demand growing dramatically, international trade is increasingly important in global cotton markets. Not only has the liberalization of textile trade helped boost world cotton demand through increased efficiency, but geographic shifts in cotton mill use have increased the role of trade in meeting the global textile industry's need for cotton. Imported cotton comprised a larger share of the world's cotton mill use in 2005/06 than in any year since the 1980s. Also, world cotton stocks outside of China have been rising in recent years, partly as a consequence of real interest rates that have been at their lowest levels since the mid-1970s, but possibly also reflecting the increasing role of trade and just-in-time inventory management in manufacturing.

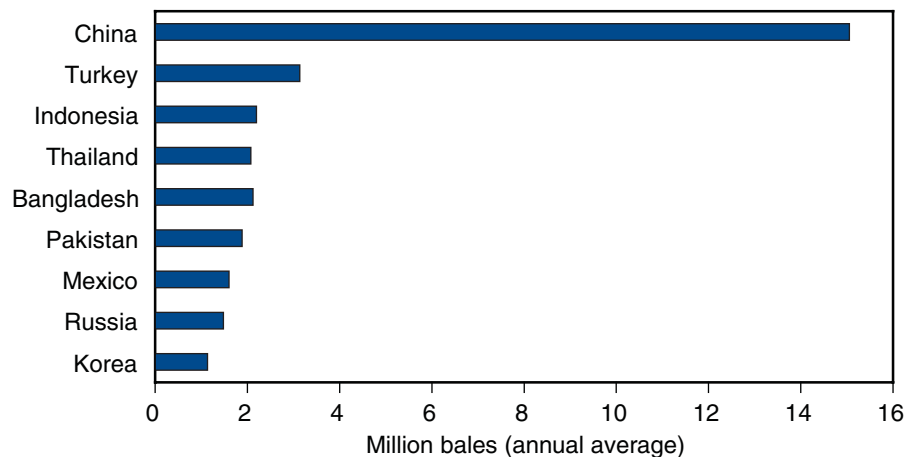
World trade's importance to cotton has rebounded in recent years as China's and (to a lesser extent) Pakistan's textile sectors have grown substantially faster than their cotton production (fig. 3). In 1999/2000, 30 percent of the cotton consumed in the world was first shipped across international borders; by 2005/06, this share had risen to 38 percent. China's imports have surged from negligible levels in 1999/2000 to 19 million bales in 2005/06. With these imports, the tariff-rate quota (TRQ) negotiated with China's 2001 World Trade Organization (WTO) accession (4.5 million bales) has turned out to account for only a small proportion of China's import needs. However, the TRQ is 2.6 times larger than China's average imports during the 10 years prior to its accession. China has opened additional TRQs regularly in recent years, which has increased the role of traded cotton in world cotton mill demand to levels not seen on a sustained basis since the late 1970s.

On the export side of the world trade equation, the United States has accounted for the lion's share of global gains, with 11 million bales of increased exports since 1999/2000 (fig. 4). India's exports are also on the upswing, 3 million bales higher in 2005/06 than in 1999/2000, and sub-

Saharan Africa’s exports grew nearly 2 million bales, a 50-percent increase. Central Asia’s exports are also higher, after falling for several years; the region’s 2005/06 exports were 800,000 bales higher than in 1999/2000. In addition, Brazil’s exports reached levels not seen since the late 1960s, 2 million bales higher than in 1999/2000.

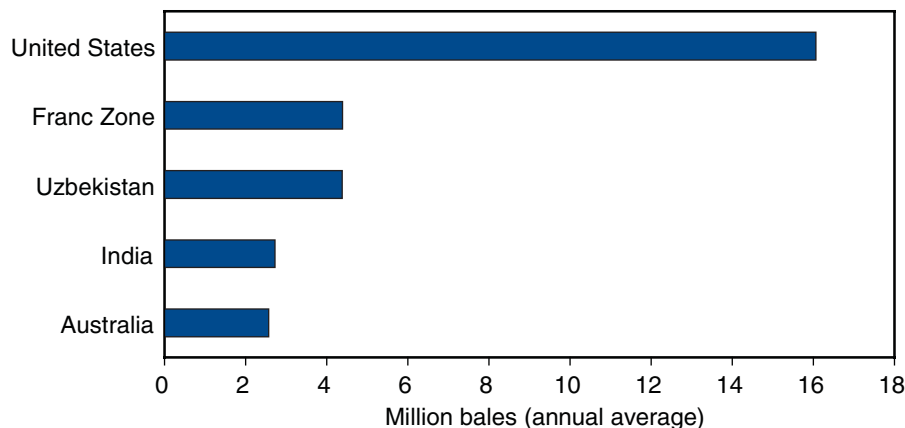
More than half the world’s cotton is now imported by countries that also produce significant amounts of cotton. Early in the 1990s, only 15 percent of world imports went to cotton-producing countries. Therefore, the world market has become increasingly dominated by countries potentially interested in the well-being of their own cotton sectors. This occurred just as U.S. cotton production became significantly more dependent on the world market. Traditionally, trade barriers to cotton have been low around the world, but as markets have shifted, the average tariff facing U.S. cotton exports has risen, and the importance of open and fair trade has grown.

Figure 3
Leading cotton importers, 2004-06



Note: These 9 countries account for 75 percent of world imports.
 Source: *World Agricultural Supply and Demand Estimates*, WAOB, USDA.

Figure 4
Leading cotton exporters, 2004-06



Note: These 5 countries account for 75 percent of world exports. Franc Zone includes Benin, Burkina Faso, Cameroon, Chad, Central African Republic, Cote d'Ivoire, Mali, Senegal, Togo, and Niger.
 Source: *World Agricultural Supply and Demand Estimates*, WAOB, USDA.

U.S. Cotton Market Background

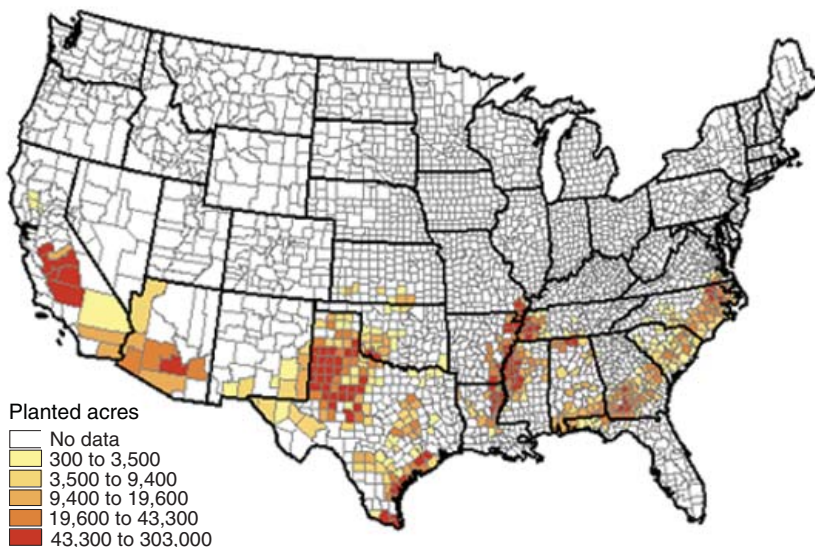
The U.S. cotton sector has experienced dramatic changes in supply and demand over the past decade. While technology has boosted cotton productivity in the United States, demand prospects have shifted from a domestic market sourced mainly with U.S. cotton to an export-oriented market where U.S. raw cotton helps supply a growing consumer demand for cotton products around the globe (appendix table 2).

Cotton is produced across 17 Southern States—from Virginia to California—but is increasingly concentrated. Major area concentrations occur on the Texas Plains; in the Mississippi, Arkansas, and Louisiana Delta; California's San Joaquin Valley; central Arizona; and southern Georgia (fig. 5). In 2002, the latest year for which census data were available, the number of farms harvesting cotton had declined 26 percent from 1997, while the area per farm had expanded 22 percent. The predominant type of cotton grown in the United States is American upland—which accounts for about 97 percent of U.S. production—with the balance commonly referred to as American Pima or extra-long staple (ELS). ELS cotton is produced chiefly in California, with small amounts grown in southwest Texas, New Mexico, and Arizona.

Demand for U.S. Cotton Shifting

U.S. cotton demand has reached new heights during the past several seasons and become more dependent upon the strength of economic conditions around the world. During the 1990s, cotton mill use in the United States accounted for 60 percent of the total demand for U.S. cotton, while exports accounted for the remainder (fig. 6). Cotton exports have become more important—accounting for about 70 percent of U.S. cotton demand over the last several seasons—as restructuring in the U.S. textile industry continues to unfold. U.S. cotton mill use peaked in 1997/98 at a record 11.3 million

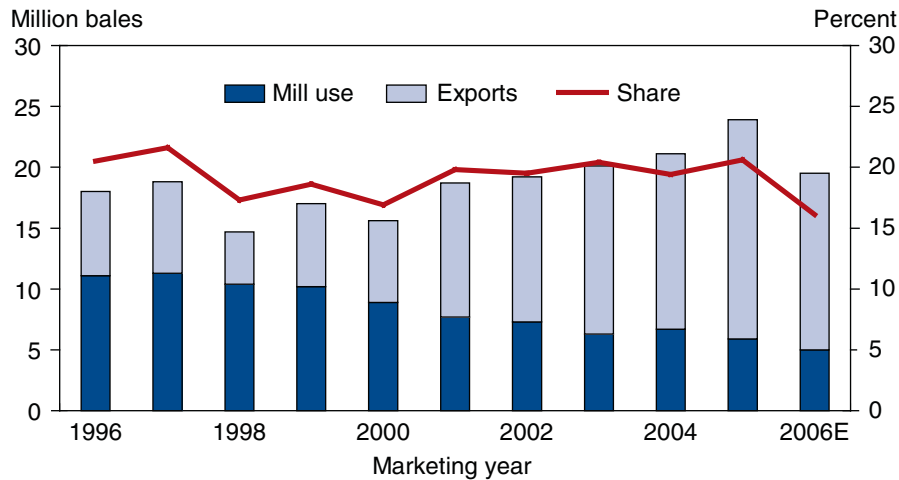
Figure 5
U.S. cotton, planted acres, 2005



Source: USDA/ERS.

Figure 6

Demand for U.S. cotton and U.S. share of world mill use



Note: 2006 is estimated.

Source: *World Agricultural Supply and Demand Estimates*, WAOB, USDA.

bales, but has since been cut by more than half as lower trade barriers and lower labor costs outside the United States boosted apparel imports.

The United States remains the leading cotton exporter to the world, accounting for 40 percent of global cotton trade over the last 5 years. The expansion of global cotton mill use—particularly in China—has altered world cotton trade in general and U.S. cotton exports specifically. China has reemerged as the leading importer of U.S. cotton over the last several years as their cotton mill use has outpaced cotton production. During the 2003-05 seasons, China, Turkey, and Mexico were the leading importers of U.S. cotton, with shipments to China far exceeding any other country.

Despite the dramatic gains posted in U.S. export volumes and global trade shares over the past 5 years, total demand (mill use plus exports) for U.S. cotton as a share of world mill use has remained stable (fig. 6). The increase in U.S. exports has been offset by a decline in U.S. mill use, resulting in U.S. cotton’s share of global use equaling about 20 percent over the last 5 years. This share is projected to decline in 2006/07 as foreign countries draw down stocks to fill rising demand.

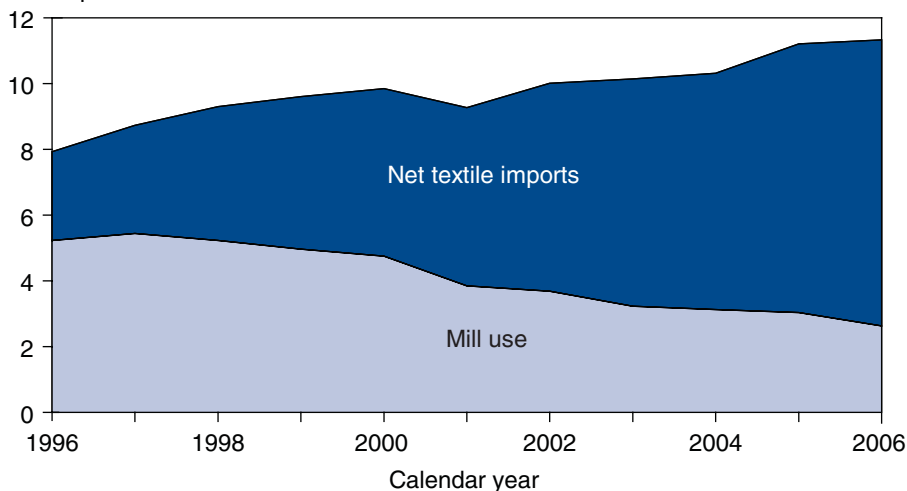
Domestic Retail Demand Rises As Cotton Textile Imports Expand

U.S. domestic retail demand for cotton (mill use plus net textile trade) in calendar year 2006 continued its upward trend, although at a slower pace than in 2005 (fig. 7). The final removal of all remaining MFA apparel quotas in January 2005 resulted in a significant expansion of imported textile and apparel products in 2005, reaching 10.5 billion pounds. In 2006, these imports rose for the 18th consecutive year to nearly 11 billion pounds. These rising imports provided increased competition for the domestic industry as U.S. cotton fiber mill use declined once again and textile exports were about unchanged for the fourth consecutive year.

Figure 7

U.S. cotton mill use and cotton-equivalent of net textile imports

Billion pounds



Source: Economic Research Service, USDA and Bureau of the Census, USDC.

As a proxy for retail sales, domestic cotton demand reached 11.2 billion pounds in 2005, 9 percent (894 million pounds) above the previous calendar year. Domestic retail cotton demand was fueled by lower-priced imported products and had risen for 4 consecutive years. Comparable gains have not been seen for nearly a decade, when the effects of the North American Free Trade Agreement (NAFTA) were most pronounced. In 1997, domestic cotton demand rose 10 percent and the gain amounted to 808 million pounds. Similarly in 1992, demand rose 14 percent from the year before, for an increase of 889 million pounds. However, these earlier years were fueled by gains in both imports and mill use, a much different environment than today. In 2006, domestic cotton demand continued higher, reaching a record 11.3 billion pounds.

With net imports of cotton textile and apparel products expanding considerably, U.S. cotton mill use accounted for only 23 percent of total domestic demand in 2006, compared with 62 percent in 1997. Meanwhile, the surge in imports pushed per capita cotton demand to nearly 38 pounds in 2006, similar to 2005. However, in 2006, only 9 pounds of this total was spun by the U.S. textile industry, the lowest share ever.

Upland Cotton Acreage Variable, But Regional Shares Stable

U.S. upland cotton planted area has averaged about 14 million acres over the past 15 years. However, significant variations can occur annually as a result of weather, prices, and the flexibility given to producers under government programs. Since 1996/97, upland cotton area has ranged between 13.1 and 15.5 million acres, but has been closer to the lower end of this range in recent years. In fact, during the first 4 years under the 2002 Farm Act, upland area ranged between 13.3 and 14.0 million acres as net return expectations for cotton and competing crops kept upland area about unchanged. However, about 15 million acres were planted in 2006/07,

following consecutive successful seasons and rising energy prices that limited some alternative crops.

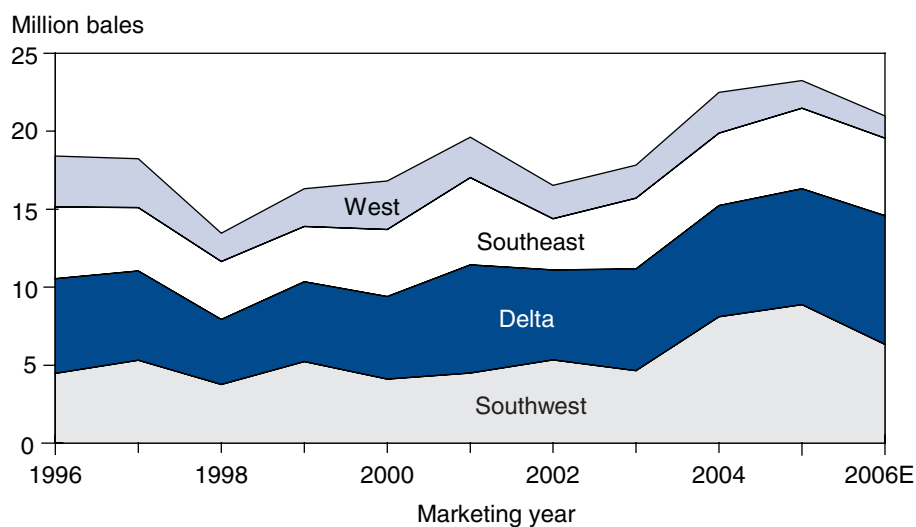
Regionally, cotton acreage shares have been relatively stable since the mid-1990s, when area had already returned to the eastern half (Southeast and Delta regions) of the U.S. Cotton Belt (fig. 8). Several factors contributed to the reversal of cotton's move westward (Southwest and West) for decades. First, the success of the boll weevil eradication program that began in the Southeast in the late 1970s and continued throughout much of the 1980s meant that cotton was once again viable there. Also, many Delta farmers adopted short-season production systems that improved yields and net income by reducing the crop's susceptibility to weather and insect damage. In addition, long periods of drought in the 1980s and early 1990s in the western United States severely limited water supplies available for cotton and other crops.

Over the past decade, the Southeast and Delta have accounted for 23 and 27 percent, respectively, of the U.S. upland cotton area, a significant gain from the 1980s when these regions combined for less than one-third of the total area. The Southwest accounts for about 44 percent of upland cotton area while the West contributes the remaining share. The Southeast has increased cotton planted acreage at the expense of corn and soybeans, while upland area in the West has shifted to more permanent tree crops.

Recent Yield Gains Push Production Higher

Although upland cotton area has remained fairly stable over the past several seasons, recent technological advances—like biotechnology, variety improvements, and the success of the boll weevil eradication program—have increased cotton productivity across the United States. In 2005, upland cotton planted to biotech (pest resistant and/or herbicide tolerant) varieties

Figure 8
U.S. upland cotton production by region



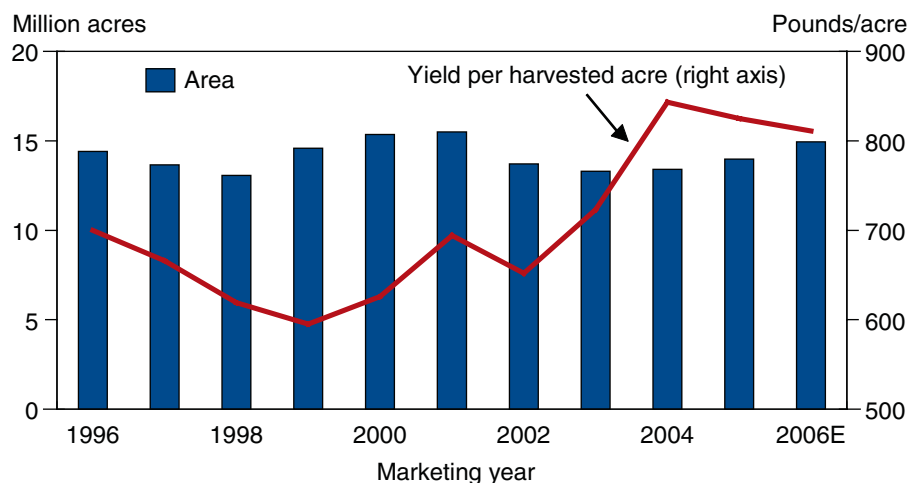
Note: 2006 is estimated.
 Source: *Crop Production*, National Agricultural Statistics Service, USDA.

accounted for nearly 80 percent of total acreage, compared with about 50 percent just 6 years ago. More intensive management systems and increased area under irrigation have also raised U.S. cotton productivity.

Weather is a chief determinant of upland cotton yields. Excellent growing conditions in 2004 and 2005, along with improved varieties, produced a record yield in 2004 (fig. 9) and a record crop in 2005. The yield of 843 pounds per harvested acre in 2004 was well above the preceding 3-year average of 689 pounds. In 2005, additional area, a second consecutive season of favorable growing conditions, and a very low abandonment rate (3 percent) pushed upland production to more than 23 million bales.³ Back-to-back record crops provided an available U.S. cotton supply not seen since the mid-1960s.

³The abandonment rate is the percentage of planted area that is not harvested. During the 1996-2005 seasons, abandonment averaged 10 percent but ranged between 3 and 20 percent.

Figure 9
U.S. upland cotton area and yield



Note: 2006 is estimated.
 Source: *Crop Production*, National Agricultural Statistics Service, USDA.

U.S. Cotton Farm and Financial Characteristics

U.S. cotton farms and their operators are similar in many respects to those of other crops, but are very different in some key areas. According to data from the 2003 Agricultural Resource Management Survey (ARMS), farms growing cotton tend to be larger than those growing other crops (table 1), with above-average gross farm incomes, government payments, farm expenses, net incomes, farm asset values, and debt-to-asset ratios.

Large farm operations are more likely to be organized into partnerships, and cotton farms are no exception. Partnerships allow operators to pool their resources to achieve economies of scale and to combine their talents in managing the farm operation. Cotton farm operators are also more likely to list farming as their occupation and to have completed high school and college compared with other farm operators.

Cotton Farms Are Higher Risk, Higher Reward

Cotton farms in 2003 generated an average net cash income of \$127,354 per farm, far more than the average of \$11,568 for noncotton farms in the cotton production regions (table 1). The higher average income generated on cotton farms is mainly due to their larger farm operations. Cotton farms averaged 1,199 acres per farm, compared with 376 acres for noncotton farms. Cotton farms' average ratio of cash expenses to gross cash income was 71 percent, compared with 91 percent for noncotton farms. This means that cotton farms could generate \$100 of gross income with less expenditures. Larger farms can achieve economies of scale by spreading management, labor, and machinery costs over more units of output, thus gaining an advantage over smaller farms.

Cotton farm operations averaged higher debt-to-asset ratios than noncotton farms in cotton production regions. Higher values for this statistic indicate more risk of financial difficulties in periods of low prices and income. However, on average, cotton farms were financially solvent based on their average debt-to-asset ratios and net cash incomes. In 2003, 76 percent of cotton farms more than covered their cash expenses from farming with their gross cash incomes (fig. 10). Farms can remain in production in the short term if they can cover their cash costs from their gross cash income and from other cash sources such as off-farm work. Without government payments included in gross cash income, only 61 percent of cotton farms were able to cover cash expenses in 2003.⁴ Thus, government payments allowed an additional 15 percent of cotton farms to obtain positive net cash incomes.

Total government payments averaged \$60,315 per cotton farm in 2003, compared with \$3,121 per noncotton farm in cotton producing States. Direct, countercyclical, and loan deficiency payments comprise most of the payments. In 2003, government payments contributed 14 percent of gross cash income on cotton farms, compared with 5 percent for noncotton farms.⁵

⁴Government payments consist of payments for direct, countercyclical (CCP), loan deficiency (LDP), marketing loan gains (MLG), net value of commodity certificates, peanut quota buyouts, milk income loss contracts (MIL), agricultural disaster (including disaster assistance and market loss), Conservation Reserve Program (CRP), Wetland Reserve Program (WRP), Environmental Quality Incentives Program (EQIP), and other Federal, State, or local government agricultural program payments.

⁵While the ARMS data provide a detailed snapshot of government payments to cotton operations in 2003, payments can vary significantly with price, as discussed later in the section, "Government Payments: Important to Cotton Sector Revenues."

Table 1

Characteristics of U.S. cotton farms and their operators, by specialization and versus noncotton farms, 2003

Item	Cotton farms			Noncotton farms (C) 1
	Specialized (A)	Nonspecialized (B)	All	
Percent of farms	63	37	100	97
Percent of cotton production	71	29	100	0
Cotton as percent of value of production	75 BC	19 AC	41	0 AB
Total operated acres per farm	1,029 BC	1,491 AC	1,199	376 AB
Owned and operated	318 C	475 C	375	217 AB
Rented	703 C	1,013 C	817	143 AB
Cropland acres	880 C	1,136 C	974	114 AB
Harvested cotton acres	521 BC	301 AC	440	0 AB
Number of commodities per farm	2.3 BC	4.1 AC	2.9	1.5 AB
Percent of farms producing:				
Corn	15 BC	47 AC	27	4 AB
Sorghum	16 C	*20 C	18	3 AB
Soybean	18 BC	30 AC	23	5 AB
Cattle	13 BC	*34 AC	21	54 AB
Wheat	17 BC	45 AC	27	6 AB
Peanut	12 BC	27 AC	18	0 AB
Operator occupation (percent):				
Farming	82 BC	91 AC	85	30 AB
Nonfarm	14 BC	*4 AC	11	48 AB
Retired	*3 C	**2 C	*3	22 AB
Operator age (mean)	54	54	54	57
Less than 50 years (percent)	35	36	35	29
65 or more (percent)	*25	*28	26	30
Operator education (percent):				
High school	93 C	92 C	93	88 AB
Completed college	28	22	26	21
Farm organization (percent):				
Sole or family proprietor	78 C	61 C	72	92 AB
Partnership	14 C	*30 C	20	4 AB
Family corporation	*6 C	*7 C	7	3 AB
Gross cash income per farm (dollars)	346,655 BC	594,895 AC	437,858	61,122 AB
Crop cash receipts	237,747 BC	374,600 AC	288,026	28,682 AB
Livestock cash receipts	*2,079 C	**54,918	**21,492	22,814 A
Government payments	57,663 C	64,880 C	60,315	3,121 AB
Federal crop insurance	8,227 C	11,290 C	9,352	637 AB
Cash production expenses	241,297 BC	429,668 AC	310,504	55,554 AB
Net cash income	105,358 C	165,227 C	127,354	11,568 AB
Farms with government payments (percent)	92 C	95 C	93	28 AB
Farms with Federal crop insurance (percent)	30 C	32 C	31	4 AB
Household income per farm family (dollars)	122,054 C	178,029 C	142,463	71,447 AB
Farm income	77,668 BC	134,379 AC	98,345	5,129 AB
Off-farm income	44,386 C	43,650 C	44,118	66,318 AB
Earned income from business or job	33,798 C	*32,330 C	33,263	50,481 AB
Percent with off-farm business or job	58 C	57	57	71 A
Average value per farm (dollars):				
Farm assets	801,503 BC	1,378,905 AC	1,013,639	602,933 AB
Farm debt	*113,063 C	*164,006 C	131,779	50,000 AB

Source: 2003 USDA Agricultural Resource Management Survey. Coefficient of Variation = (Standard Error/Estimate)*100.

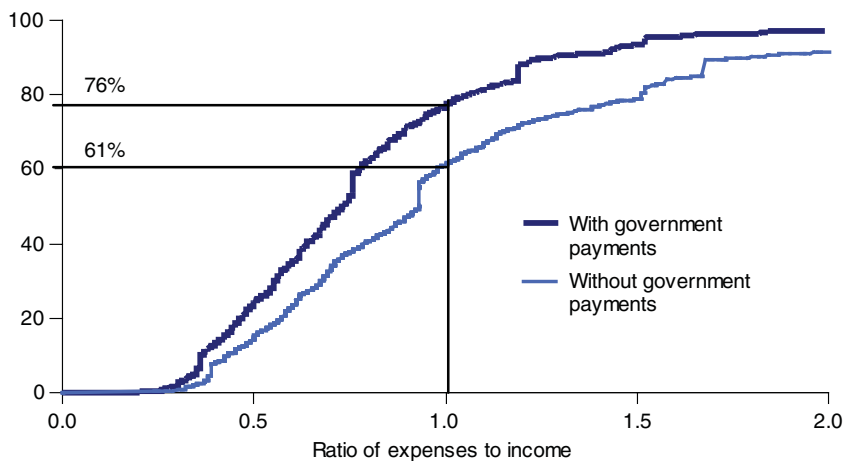
* indicates that CV is greater than 25 and less than or equal to 50. ** indicates that CV is above 50.

A, B, and C mean significant differences with indicated column based on t-statistics at a 90 percent confidence level or higher.

¹Include data on noncotton farms in cotton producing States of AL, AZ, AR, CA, FL, GA, KS, LA, MS, MO, NM, NC, OK, SC, TN, TX, and VA.

Figure 10

Distribution of cotton farms by ratio of cash expenses to gross cash income for the farm operation, 2003



Data source: USDA 2003 Agricultural Resource Management Survey and ERS calculations.

Cotton Farm Characteristics Differ by Region

Cotton farm characteristics did differ among regions in 2003, but the differences were not always statistically significant and may be due to chance (table 2). For example, net cash income on cotton farms ranged from \$82,437 in the Southwest to \$223,780 in the West, but statistically speaking, these cotton farms did not generate significantly different average net cash incomes from farming.⁶ In addition, the average household income of cotton operators did not differ in a statistically significant way. However, many other items were significantly different, and are noted in table 2.

Southeast cotton farms accounted for 31 percent of all cotton farms and produced 25 percent of the value of production.⁷ Southeast farms were the smallest in terms of cotton acreage as well as total operated acreage. They ranked third in cotton yields as Southeast producers were the least likely among all regions to irrigate their cotton. However, Southeast cotton farms were more diversified, averaging 3.5 commodities per farm in 2003 versus 2.9 or less commodities for the other farms. Southeast cotton farms were more likely to raise wheat, peanuts, or tobacco, and had the greatest likelihood of a family member employed off-farm.

Delta cotton farms represented 24 percent of all cotton farms and 35 percent of the cotton value of production.⁸ Average cotton acreage and total farm acreage were not significantly different from those in the Southwest and West. However, Delta cotton farmers owned less farm acreage than Southwest and West cotton farmers. Yields in the Delta were second highest. About half of the Delta cotton farms also raised soybeans and a quarter grew corn.

The Southwest contained 38 percent of U.S. cotton farms and produced 25 percent of the cotton value.⁹ Average cotton yields were lowest among all the regions due to the hot, dry climate and low percentage of irrigated acreage. The Southwest's climate limits the choice of crops that can be grown profitably, so cotton farms there are more likely to grow wheat and sorghum as low-cost alternatives.

⁶Since the sample sizes were small and there is a wide range of values for income (including negative values), the variances around these sample means are relatively large and overlapping. Therefore, we cannot rule out that the population means are not different.

⁷The Southeast region consists of farms in Virginia, North Carolina, South Carolina, Georgia, Alabama, and Florida.

⁸The Delta region consists of farms in Tennessee, Mississippi, Arkansas, Louisiana, and Missouri.

⁹The Southwest region consists of farms in Kansas, Oklahoma, and Texas.

Table 2

Characteristics of U.S. cotton farms and their operators, by region, 2003¹

Item	Southeast (A)	Delta (B)	Southwest (C)	West (D)
Percent of farms	31	24	38	7
Percent of cotton production	25	35	25	16
Cotton as percent of value of production	41 BD	60 ACD	43 B	*24 AB
Total operated acres per farm	852 CD	*1,203	1,459 A	1,270 A
Owned and operated	328 D	209 CD	463 B	650 AB
Rented	506 C	*993	995 AD	616 C
Cropland acres	664 CD	*1,136	1,093 A	1,117 A
Harvested cotton acres	346 CD	*538	448 A	468 A
Number of commodities per farm	3.5 BCD	2.4 A	2.9 A	2.9 A
Percent of farms producing:				
Corn	36 D	*26 D	*25 D	**4 ABC
Sorghum	**1 BC	*10 ACD	39 ABD	—
Soybeans	32 CD	*50 CD	*2 ABD	0 ABC
Cattle	*26 BD	*4 AC	*30 BD	**2 AC
Wheat	19 BCD	*10 ACD	43 AB	37 AB
Hay	*6 BD	**0 ACD	*6 BD	53 ABC
Peanuts	49 BCD	—	*6 ABD	—
Tobacco	20 BCD	0 A	0 A	0 A
Operator occupation (percent):				
Farming	82 B	92 AC	84 B	84
Nonfarm	*16 BD	*5 AC	*12 BD	—
Retired	**2	**2	**4	**3
Operator age (mean)	51 C	53	57 A	53
Less than 50 years (percent)	46 C	*35	25 A	39
65 or more (percent)	18	**32	32	*16
Operator education (percent):				
High school	87 BD	97 AD	93 D	100 ABC
Completed college	18 CD	**25	27 AD	46 AC
Farm organization (percent):				
Sole/family proprietor	80 D	76 D	69 D	*41 ABC
Partnership	13 D	*19 D	**20 D	47 ABC
Family corporation	*6	*3 C	*9 B	*8
Gross cash income per farm (dollars)	365,965 D	*517,517 D	309,534 D	1,139,032 ABC
Crop cash receipts	245,014 CD	*417,789 CD	141,287 ABD	805,013 ABC
Livestock cash receipts	**4,647	**2,969	**49,836	**3,984
Government payments	56,715 D	*64,794	53,469 D	96,016 AC
Direct	23,151 CD	*37,131	28,796 AD	49,198 AC
CCP and LDP	22,399 CD	*23,109 D	13,643 AD	43,044 ABC
CRP, WRP, and EQIP	1,025	*1,593	*1,392	**1,100
Other	*10,140 BD	2,961 AC	9,638 BD	**2,674 AC
Federal crop insurance	10,990 BD	*1,688 AC	13,913 BD	*3,677 AC
Cash production expenses	236,958 D	*350,144 D	227,097 D	915,251 ABC
Net cash income	129,007	*167,373	*82,437	**223,780
Farms with Government payments (percent)	94	91	95	92
Farms with Federal crop insurance (percent)	38 BD	*10 AC	42 BD	*9 AC

—Continued

—Table 2 Continued

Household income per farm family (dollars)	132,367	*149,119	125,813	*265,081
Farm income	88,542	*116,388	75,153	**216,363
Off-farm income	43,825	32,731 CD	50,660 B	48,718 B
Earned income from business or job	35,870 B	*20,995 A	39,898	26,633
Percent with off-farm business or job	69 CD	*51	53 A	51 A
Average value per farm (dollars):				
Farm assets	1,071,418 CD	*693,864 D	773,216 AD	3,038,685 ABC
Farm debt	108,392 D	*83,516 D	100,061 D	*545,749 ABC

Source: USDA 2003 Agricultural Resource Management Survey. Coefficient of Variation (CV) = (Standard Error/Estimate) x 100. * indicates that CV is greater than 25 and less than or equal to 50. ** indicates that CV is above 50.

— = Data insufficient for disclosure. A, B, C, and D mean significant differences with indicated column based on t-statistics at a 90 percent confidence level or higher. Southeast includes VA, NC, SC, GA, AL, and FL. Delta includes TN, MO, AR, MS, and LA. Southwest includes KA, OK, and TX. West includes NM, AZ, and CA.

Cotton farms in the West differ markedly from cotton farms in the other regions.¹⁰ The West accounted for only 7 percent of cotton farms in 2003, but produced 16 percent of U.S. cotton as a result of high yields. Cotton yields in California averaged nearly 2.75 bales per acre, versus 1 bale in Texas. Cotton farms in the West harvested 468 acres of cotton per farm, about the same as Delta and Southwest farms. The dry climate in the West limited the types of crops grown there. About half of the cotton farms also raised hay, while just over a third grew wheat.

Cotton farms in the West averaged more gross cash income and higher cash expenses, but their average net cash income did not differ significantly from cotton farms in other regions. The high percentage of irrigated cotton acreage in the West likely contributed to their higher gross incomes and expenses. Western cotton farms received the most government payments per farm, \$96,016, but had the lowest ratio of government payments to gross cash income at 8 percent, compared with 13-17 percent in other regions.

Western cotton farmers also owned the most acreage per farm, had the highest ratio of owned-to-operated acreage, and had the highest value of farm assets and equity. Pooling of resources may have resulted in more owned land in Western cotton operations since they are more likely to be organized as partnerships—47 percent compared with 20 percent or less for farms in the other regions.

Specialized Cotton Operations Dominate, But Nonspecialized Farms Important Too

Farm operations more reliant on cotton are likely to see greater impact from changes in cotton supply and demand, resulting from either altered farm policy or from market or production conditions that influence the cotton markets. For analytical purposes, cotton farms were divided into specialized and nonspecialized operations based on the composition of their value of production. Specialized cotton farms were those where half or more of the value of production was derived from cotton; nonspecialized cotton farms derived less than half their value of production from cotton.

In 2003, 63 percent of U.S. cotton farms specialized in cotton (table 1). These farms produced 71 percent of the value of U.S. cotton production on

¹⁰The West region consists of farms in New Mexico, Arizona, and California.

half of their 1,029 acres per farm. Nonspecialized cotton farms accounted for 37 percent of all cotton farms and produced 29 percent of the cotton value of production. Nonspecialized cotton farms operated more total acreage, an average of 1,491 acres per farm, but had only 20 percent of their acres committed to cotton production. Consequently, nonspecialized cotton farms were diversified operations that were more likely to raise corn, soybeans, wheat, peanuts, and cattle than specialized cotton farms. With farm income derived from multiple agricultural commodities, nonspecialized cotton farms were less vulnerable to shocks to any particular commodity market; specialized cotton farm operations were more vulnerable to swings in income from changing cotton prices or yields.

Specialized cotton farms generated, on average, lower gross cash incomes, cash expenses, and net incomes per farm than nonspecialized cotton farms. In 2003, net cash income from specialized cotton farms averaged \$105,358, compared with \$165,227 on nonspecialized farms. Specialized cotton farms are less efficient in generating \$100 in gross cash income. On average, it cost them \$70 to generate \$100 in income in 2003, compared with \$62 for nonspecialized cotton farms. In addition, government payments accounted for 17 percent of gross cash income for specialized cotton farms, versus 11 percent for nonspecialized cotton farms.

In 2003, household income averaged \$122,054 per family for specialized cotton farm operators, compared with \$178,019 for nonspecialized cotton operators. Although average farm income was higher for nonspecialized cotton farms, average off-farm income was nearly the same as for specialized cotton farms. Often, off-farm income is more stable than farm income; about 57 percent of the farm families on specialized and nonspecialized cotton farms had someone in the family working a nonfarm job or business in 2003.

Cotton Farm Household Income Varies Significantly

The household income for cotton producers averaged \$142,463 in 2003 (table 1). In comparison, the household income for noncotton farms in cotton-producing States averaged \$71,447, just over half that of cotton producers.¹¹ Household income for all farm operators averaged \$68,597, while the U.S. household income averaged \$59,067 in 2003. For most farm households, income from off-farm sources exceeds income from the farm operation.¹² However, cotton producers derive the majority of their family income from the farm. Often, large farm operations leave their operators with little time for nonfarm occupations, while higher farm incomes may lessen the need for these operators or their family members to earn off-farm income. Eleven percent of cotton producers listed nonfarm jobs or businesses as their main occupation, compared with 48 percent of noncotton farm operators (table 1).

Incomes received by cotton farm families vary widely. When grouped into household income quintiles (table 3), cotton producers' families in the lowest quintile had, on average, negative household incomes. In this category, many farm operations lost money and off-farm income often was not enough to cover the loss. Frequently, cotton producers in this quintile were

¹¹Cotton farms are compared to farms not harvesting cotton in the States where cotton is usually produced. These States are Alabama, Arizona, Arkansas, California, Florida, Georgia, Kansas, Louisiana, Mississippi, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

¹²Off-farm income includes income from off-farm businesses or jobs, Social Security payments, pensions, interest and dividends, gifts, royalties, rental properties, trusts, and other sources.

operating large farms with high debt-to-asset ratios. Farms with high debt-to-asset ratios are at higher risk of generating insufficient income to meet debt repayments, interest, and other financial needs when yields or prices are low. Many households in the lowest quintile would have needed to sell assets, dip into savings, take out loans, or rely on gifts to meet their income needs during 2003.

In the middle quintile, average farm income exceeded average off-farm income, and both were higher than in the lower quintiles. Operators in the middle quintile group operated an average of 684 acres, less than operators in all other quintiles. The average debt-to-asset ratio for farms in the mid-quintile group was lower than for farms in the lowest quintile but about the same as those in the highest quintile.

Families in the high-income quintile received high farm and off-farm incomes. Operators in this group had the largest cotton farms, averaging 1,993 acres. These operators obtained the highest cash receipts per acre, while controlling their cash costs per acre.

Table 3

Household income per farm family and selected characteristics of cotton producers, by quintiles, 2003¹

Item	1 to 20 (A)	21 to 40 (B)	41 to 60 (C)	61 to 80 (D)	81 to 100 (E)
Household income					
per farm family (<i>dollars</i>)	-53,791 BCDE	41,367 ADE	76,709 ABDE	140,113 ABCE	506,913 ABCD
Farm income	-71,512 BCDE	10,518 ACDE	44,529 ABDE	93,563 ABCE	413,715 ABCD
Off-farm income	17,720 BDE	30,849 ADE	32,180 E	46,550 ABE	93,198 ABCD
Earned income from business or job	8,642 BCDE	23,306 ADE	26,894 AE	38,613 ABE	68,765 ABCD
Percent with off farm business or job	37 BDE	64 A	58	70 AE	60 AD
Acres per farm	1,166 E	707 DE	684 DE	1,447 BC	1,993 ABC
Operator age 65 or older (<i>percent</i>)	43	18	32	19	16
Debt/asset ratio of the farm (<i>percent</i>)	21	14	8	10	10
Per farm:					
Gross cash income (<i>dollars</i>)	346,354 BCE	176,321 ADE	154,585 ADE	393,956 BCE	1,129,510 ABCD
Cash production expenses (<i>dollars</i>)	379,854 BCE	148,735 ADE	112,566 ADE	262,118 BCE	639,905 ABCD
Net cash income (<i>dollars</i>)	-33,499 BCDE	27,586 ADE	*42,018 ADE	131,838 ABCE	489,605 ABCD
Cash expenses/ gross cash income (<i>percent</i>)	110 BCDE	84 ACDE	73 ABE	67 ABE	57 ABCD

Source: USDA 2003 Agricultural Resource Management Survey and ERS calculations. Coefficient of Variation (CV) = (Standard Error/Estimate) x 100. * indicates that CV is greater than 25 and less than or equal to 50.

A, B, C, D, and E mean significant differences with indicated column based on t-statistics at 90-percent confidence level or higher.

¹Cotton producers were ranked from lowest to highest based on household income per family and divided into five equal groups.

Government Programs

U.S. farm policy is an important factor in producers' decisionmaking. Total planting flexibility, introduced in the 1996 Farm Act, enabled many cotton producers who had participated in previous commodity programs to shift area to other crops (excluding certain fruits and vegetables), and producers of other crops to shift area to cotton. The 2002 Farm Act extended this planting flexibility, but also introduced some new policies.¹³

Commodity Programs Affecting the U.S. Cotton Sector

The 2002 Farm Act provides various forms of government assistance for major crops, including upland cotton. Programs include the marketing loan program, direct payments, and countercyclical payments. In addition, the Federal crop insurance program benefits cotton producers by guarding against crop or revenue losses. The 2002 Farm Act governs Federal farm programs over a 6-year period (2002-07) and includes the following provisions for the cotton sector. (The programs discussed in this section pertain to upland cotton only. While nonrecourse loans are available for ELS cotton, the repayment rate is set at the loan rate (79.77 cents per pound) plus interest, thus preventing any marketing loan program benefits.)

Marketing Loan Program. Marketing loan provisions of the 2002 Farm Act extended those of the 1996 Farm Act and established a national loan rate for upland cotton at 52 cents per pound. (Although the 2002 Farm Act extended the program in the 1996 Farm Act, the marketing loan program for upland cotton is a legacy of the 1985 farm legislation.) The nonrecourse loans provide short-term liquidity until a farmer's cotton crop is marketed, and the loans are available to current upland cotton producers who pledge their production as collateral. The marketing loan program may also provide income support through payments to upland producers when market prices are low, which guarantee a minimum per-pound revenue.

Upland marketing loans may be settled by producers through forfeiture of the cotton (without penalty) to the Commodity Credit Corporation (CCC) at maturity or by repayment of the loan at the current repayment rate—the lesser of the loan rate or the adjusted world price (AWP), an alternative repayment rate established weekly by USDA based on prevailing world market prices in Northern Europe—at or before maturity. If the producer repays the loan at a repayment rate below the loan rate, the benefit realized by the producer is called a marketing loan gain (MLG). Alternatively, producers can forgo the loan and accept a loan deficiency payment (LDP) if the repayment rate is below the marketing loan rate. If the producer receives an LDP or an MLG, the government-operated CCC absorbs these costs. In addition, commodity certificates purchased at the AWP can also immediately be used to repay commodity loans.

Upland cotton marketing loan program expenditures have varied considerably over the past decade as market prices and the payments under this program are inversely related. During the first 4 years of the 2002 Farm

¹³For additional information, see "Program Provisions," <http://ers.usda.gov/briefing/farmpolicy/programprovisions.htm>

Act, the marketing loan benefits averaged \$817 million annually, well below the 4 years prior to this legislation when benefits averaged \$1.3 billion.

Storage and Interest Credits. For the 1986-2006 crops, the CCC has provided by regulation that upland cotton loans can be repaid at the lower of (1) the loan rate plus interest or (2) the AWP. This means that interest is not charged on loan repayments when the AWP is below the loan rate or when interest charges would raise the loan repayment price above the AWP. Likewise, since monthly storage costs accumulate while cotton is under loan and are typically paid by the redeemer of the loan (who then removes the cotton from the warehouse), the CCC provides storage credits under the marketing loan program to ensure the cotton can be removed from the warehouse at the AWP. The storage credit is equal to the monthly storage costs that have accumulated during the period the cotton was under the CCC loan and is deducted from the loan repayment price. Effective for 2006 and subsequent crops, credits for monthly storage costs are subject to maximum rates approved by the CCC.

Direct Payments. Direct payments under the 2002 Farm Act are similar to the production flexibility contract (PFC) payments under the 1996 Act. These benefits are tied to a particular farm's historical production level—upland cotton program base acres and yield—rather than production of any particular year's crop. Thus, even though current producers may receive these payments, cropping decisions are flexible and more closely tied to market incentives, such as prospective returns from alternative crop choices.

Direct payments are a fixed predetermined payment that does not depend on market conditions. The direct payment equals 85 percent of the farm's base acreage times the farm's direct payment yield times the fixed payment rate of 6.67 cents per pound for upland cotton. During the first 4 crop years (2002/03-2005/06) of the 2002 Farm Act, upland cotton direct payment expenditures averaged \$615 million annually.

Countercyclical Payments. Countercyclical payments (CCP) under the 2002 Farm Act (like direct payments) are based on historical acreages dedicated to crops eligible for farm program benefits. Landowners who have established upland cotton base acres are eligible for CCPs that are inversely related to market price. CCPs are intended to replace ad hoc market loss assistance payments, which supplemented PFC payments in the 1998-2001 crop years.

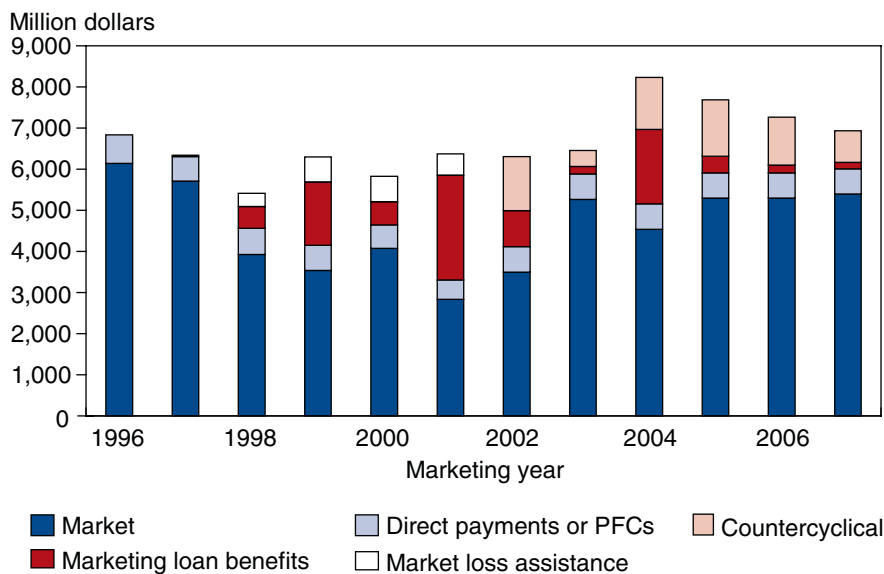
CCPs are made when the upland cotton target price (72.4 cents per pound) minus the upland cotton direct payment rate (6.67 cents) is above the higher of the loan rate (52 cents) or the season-average farm price. The calculated difference, when positive, is the CCP rate. Upland cotton base acreage is eligible for CCPs when the season-average farm price is below 65.73 cents per pound, which has been the case since the program began. The CCP equals 85 percent of the farm's base acreage times the farm's CCP yield times a CCP rate that can range from 0 to 13.73 cents per pound. During the first 4 crop years of the 2002 Farm Act, upland cotton CCP expenditures averaged nearly \$1.1 billion annually.

Crop Insurance Program. Cotton producers also benefit from the U.S. crop and revenue insurance programs that guard against adverse weather and insect or weed infestations. Since the 2001 crop year, over 90 percent of planted cotton area has been insured annually under the Federal crop insurance program. In 2005/06, 13 million acres of upland cotton were insured and total crop insurance premiums were about \$330 million, 63 percent of which were paid by the Government. Since the enactment of the Agricultural Risk Protection Act of 2000, which increased premium subsidies, upland cotton producers have shifted from traditional crop yield insurance to revenue insurance. Revenue insurance has accounted for roughly 40 percent of the cotton crop insurance coverage over the last three seasons. A large percentage of cotton acres in 2004/05 was insured at coverage levels below 70 percent, unlike most other major field crops where coverage levels were at 70 percent or above.

Government Payments Important to Cotton Sector Revenues

Government commodity programs were established over the years to help soften the effects of low commodity prices. Cotton farmers, like other commodity producers, depend heavily on revenues from the sale of their agricultural products in the marketplace (fig. 11). However, cotton prices can fluctuate dramatically—as seen in the past decade—and can alter sector revenues significantly. Upland cotton farm prices ranged from nearly 70 cents per pound in 1996/97 down to about 30 cents in 2001/02. Since 2002/03, these prices have ranged between 42 and 62 cents per pound, averaging 49 cents. For the 2002-2005 crops, about 70 percent of the annual revenue for the upland cotton sector came from the marketplace with the

Figure 11
Revenue sources for the upland cotton farm sector



Note: Revenue estimated for 2005 and projected for 2006 and 2007.
 Source: *Crop Values*, National Agricultural Statistics Service, USDA, and fiscal year 2007 President's Budget.

remaining 30 percent from government payments. Although government programs have evolved over the past decade, similar shares, on average, were noted for the 1996-2001 marketing years.

Under the 2002 legislation, most of the actual and projected payments are direct and countercyclical payments to farms with cotton base acres, rather than marketing loan benefits associated with current cotton production. However, the 2004/05 marketing year was an exception. During 2004/05, farm prices fell well below the loan rate and cotton producers were eligible for marketing loan benefits that reached \$1.8 billion, their highest since 2001/02, another year of very low cotton prices. Marketing loan benefits in 2004/05 totaled nearly half of all government payments to the cotton sector, with total government payments that year accounting for 45 percent of upland cotton revenue.

Domestic and Trade Policy Issues

Government payments—level, type, and eligibility—under future legislation is a source of uncertainty for stakeholders in the cotton sector, including cotton farmers and owners of cotton base acres. Most likely, cotton policy under the 2007 farm bill will be determined largely by decisions affecting the overall direction of farm policy, particularly programs associated with direct commodity payments to producers of major field crops. Domestic market conditions and Federal budget concerns are important in this debate, but trade policy and domestic support issues—particularly related to the Doha Round of the World Trade Organization (WTO) negotiations and regional trade agreements—will also likely enter into discussions. Although cotton has been singled out by a number of countries in recent WTO negotiations, adjustments in cotton-specific provisions of U.S. farm legislation will be debated largely within the context of broader budget priorities and international obligations that are intertwined with domestic market and policy developments.

The current and projected Federal budget deficit, in particular, could play a significant role in the farm bill debate. The 2002 Farm Act provisions were considered at a time when projected budget surpluses allowed for increased spending on farm programs. The 2007 farm bill debate, however, is occurring at a time when there is concern over projected deficits in the Federal budget, which could affect funding for domestic farm programs. This could result in potential changes to the overall level of spending and basic structure of commodity programs, or in modifications to the parameters of existing programs. For example, loan rates, direct and countercyclical payment rates, the use of commodity certificates, payment limitations, and crop insurance provisions could be reconsidered. In addition, funding for crops currently supported by commodity programs could compete with proposals to provide support for other commodities, to expand support for conservation programs, or to change current restrictions on planting fruits and vegetables (Womach, 2005).

WTO Issues

Trade policy concerns associated with regional and international trade agreements, such as those of the WTO, have increasingly become a part of the U.S. farm bill debate. As a member of the WTO, for example, the United States agreed to limit the amount of trade-distorting domestic support provided to the agricultural sector. Cotton producers benefit from marketing loans, countercyclical payments, and crop insurance subsidies that are, or may be, subject to these spending limits under the existing WTO agreement. These spending limits could be further reduced and/or modified. Tariffs and other barriers to market access—both in the United States and abroad—could also be an issue in farm bill discussion as a new WTO agreement is negotiated and the impact of regional trade agreements liberalizing U.S. cotton textile imports continue to unfold.

The influence of multilateral agreements on U.S. farm policy has been highlighted in recent years by Brazil's successful challenge of U.S. cotton programs through the WTO's dispute settlement process. Brazil's 2002

complaint—that certain U.S. cotton domestic and trade policies had caused “serious prejudice” to Brazil by depressing world cotton prices—was mostly accepted by a WTO dispute settlement panel, and then upheld by the WTO’s Appellate Body in March 2005. Brazil’s WTO challenge of U.S. cotton programs will not only have a direct impact on cotton but may also alter other U.S. commodity programs, including the marketing loan and counter-cyclical payment programs. The United States has already made some adjustments to its export credit guarantee programs to comply with one aspect of the WTO ruling on export subsidies (Schnepf, 2005). Additionally, the President signed legislation in February 2006 that repealed the Upland Cotton User Marketing Certificate (Step 2) program, a considerable focus in Brazil’s WTO challenge.

Step 2: Upland Cotton User Marketing Certificate Program Repealed

On August 1, 2006, the Step 2 or Upland Cotton User Marketing Certificate program came to an end. Repeal of the Step 2 program terminated a prohibited export subsidy and an import substitution subsidy cited by the World Trade Organization (WTO) panel. It also addressed a WTO finding regarding suppression of world cotton prices. This legislative action is in addition to the July 2005 administrative measures the United States undertook to implement the WTO’s findings with respect to export credit guarantees.

For fiscal years 2001-05, outlays for Step 2 averaged \$364 million annually. With U.S. upland cotton exports and domestic use averaging about 19 million bales during this time, the program’s spending was equivalent to 3.8 cents per pound of U.S. cotton consumed. The Step 2 payments were made directly to U.S. mills, for U.S. upland cotton consumed, for the week during which bales qualifying for a payment were used. For exported cotton, payment was to the U.S. exporter for the week during which bales qualifying for payment were exported. Therefore, cotton importers in other countries were influenced by Step 2 payments only indirectly, and the size of the Step 2 payment applying to a given shipment was probably unknown when the export sale transaction was initiated. Step 2 allowed buyers to pay higher prices for U.S. cotton while offering it for sale at more competitive levels.

Step 2 was an important component of the U.S. cotton program for over a decade. Analysis by the Food and Agricultural Policy Research Institute (FAPRI) suggests that in the absence of the Step 2 program, U.S. cotton use during 2006/07-09/10 will be 1.4 percent lower than if the program had continued. Analysis by the Cotton Economics Research Institute (CERI, Texas Tech University) suggests a smaller impact, a 0.8-percent decline. The difference between these two estimates is primarily in exports, with FAPRI showing a 1.8-percent decline and CERI showing a 0.9-percent decline.¹⁴

¹⁴For more information, see <http://usda.mannlib.cornell.edu/usda/ers/CWS//2000s/2006/CWS-03-13-2006.pdf>; and <http://www.ers.usda.gov/briefing/cotton/specialprovisions.htm>.

Textile Issues

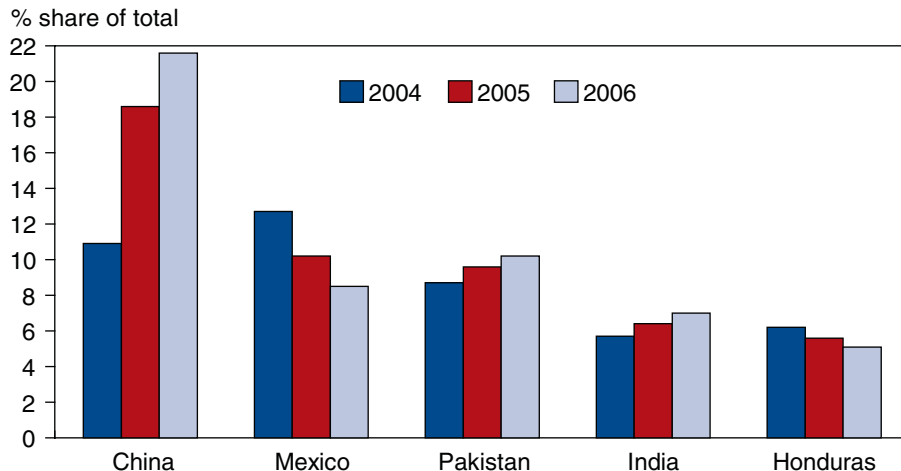
Recent changes in global textile and apparel production concern both U.S. cotton industries and a number of other countries around the world. The removal of MFA quotas has and will continue to affect the geographic distribution of textile and apparel production and trade, as lower wages, subsidies for capital investment, and other factors favor clothing production in lower income countries.

There are also many unresolved issues regarding potential effects of quota removal on trade policy in importing and exporting countries. China imposed export duties on about 60 percent of its clothing exports in December 2004, to help alleviate concerns about its post-MFA export prospects. Also, China's WTO accession agreement included provisions for importing countries to impose special safeguards on textile and apparel imports from China through 2008. The United States, Turkey, and the EU have moved to impose some safeguards to help buffer their domestic industries from a flood of imports. In the United States in 2005, China replaced Mexico as the leading foreign supplier of cotton textile and apparel products, accounting for 19 percent versus Mexico's 10 percent (fig. 12). Ironically, China had relinquished the top spot to Mexico a decade earlier in 1995, the year after NAFTA's introduction. In 2006, the recent patterns continued with China accounting for nearly 22 percent of U.S. imported cotton products. In addition, Pakistan replaced Mexico as the second leading supplier and accounted for 10 percent of the total.

Although the MFA quotas have been fully phased out, other policy instruments, such as safeguards, tariffs, and preferential agreements, continue to affect the global cotton market. While tariffs on textiles and clothing remain significantly higher than tariffs on most manufactured products, countries with preferential market access typically pay lower tariffs, influencing production trends. Consequently, the global landscape for textile and apparel production and trade continues to evolve. Adjustments will be seen for a number of years as further concentration of global textile suppliers is likely and competition for market share continues.

Figure 12

U.S. cotton textile import share by origin for top five suppliers (raw-fiber-equivalent basis)



Source: USDA, Economic Research Service calculation based on U.S. Bureau of Census data.

The Multifiber Arrangement (MFA) Dismantled

As is the case with raw cotton, much of the world's clothing is traded across international borders before it reaches the consumer. In 2000, 31 percent of the clothing consumed in the world was imported. By 2004, this share had increased, approaching 90 percent in the United States and Japan by some measures. Therefore, trade policy has significant impacts on clothing demand and production. In turn, this can have significant impacts on raw cotton fiber mill use, trade, and production around the world. In 2005, world clothing trade was significantly liberalized as the import quotas inherited from the Multifiber Arrangement (MFA) were eliminated.

The MFA was a multilateral agreement signed in 1974, but its roots stretch back to the 1930s. At that time, during a period of global economic distress, Japan emerged as the largest exporter of cotton textiles, and the United States and Europe moved to limit imports from Japan to preserve their domestic markets for their own textile industries. These restraints never really went away. By the 1960s, they had been extended to Hong Kong, Pakistan, and India. By 1994, the United States had negotiated agreements establishing textile and clothing import quotas with 40 exporting countries.

The 1995 Uruguay Round Agreements (URA) on international trade liberalization included an agreement to phase out the MFA quotas within 10 years. For the United States, the MFA quotas had an impact on trade equivalent to an import tariff of about 20 percent. Removing the MFA quotas has increased clothing imports by the United States and the European Union, reduced clothing and textile production in these markets, and increased textile production in China, India, and Pakistan. Increased raw cotton imports by China and Pakistan are in part a consequence of the end of the MFA, as is reduced mill use in the United States.¹⁵

¹⁵For more information, see MacDonald and Vollrath, 2005; and MacDonald, 2006.

Conclusion

Like producers of other agricultural commodities, U.S. cotton growers have confronted pressures from market forces and the impacts of both domestic and international policies. Trade barriers to cotton traditionally have been low around the world, but as markets have shifted, the average tariff facing U.S. cotton exports has risen, and the importance of open and fair trade has grown. While demand for U.S. cotton has increased considerably over the last several years, the United States has become an export-dominated market as the domestic textile industry has declined significantly. As a result, global competition, the uncertainty of worldwide demand, and the changing global textile landscape provide many challenges for the U.S. cotton industry.

Although the farm economy environment is different today than leading up to the 2002 farm legislation, many of the same concerns are likely to be addressed. Future policy affecting the cotton sector is likely to develop within the scope of the overall farm policy and could include planting flexibility, maintaining income support and risk management for farmers, enhancing market access, and promoting environmental responsibility. Additional adjustments in cotton-specific provisions are likely to be debated within the context of domestic budget priorities, particularly with regard to programs affecting commodity payments to producers of major field crops. Current and prospective trade agreements will also be intertwined with these discussions and provide additional uncertainty about future farm legislation.

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Useful Links

Cotton and Wool Yearbook tables

(<http://usda.mannlib.cornell.edu/MannUsda/viewDocumentsInfo.do?documentID=1282>) include historical data covering U.S. and foreign cotton production, trade, use, and prices.

Production, Supply, and Distribution (PSD) database

(www.fas.usda.gov/psd/) contains official USDA data on production, supply, and distribution of agricultural commodities for the United States and major importing and exporting countries. The database provides projections for the coming year and historical data for more than 200 countries and major crop, livestock, fishery, and forest products.

WTO Agricultural Trade Policy Commitments Database

(www.ers.usda.gov/db/wto/) contains data on implementation of trade policy commitments by WTO member countries. Data on domestic support, export subsidies, and tariffs are organized for comparison across countries. This queryable database offers various options for viewing and downloading data.

Quick Stats: Agricultural Statistics Database (www.nass.usda.gov/Quick-Stats/) offers U.S., State, and county-level agricultural statistics for many commodities and data series. Quick Stats offers the ability to query by commodity, State, and year. The dataset can be downloaded for easy use in a database or spreadsheet.

Agricultural Atlas of the United States

(www.nass.usda.gov/research/atlas02/) provides maps showing county-level data from the 2002 Census and some maps showing increases and decreases from 1997 Census data.

Farm Policy Background, Program Provisions, and History

(www.ers.usda.gov/Briefing/FarmPolicy/historyOfFarm.htm) provides access to previous Farm Acts and policy backgrounders prepared by ERS for those Acts.

Farm Program Acres (www.ers.usda.gov/data/baseacres/) allows downloading and mapping of county-level farm program and planted acreage data for nine major program crops (corn, grain sorghum, barley, oats, wheat, rice, cotton, peanuts, and oilseeds).

Farm Programs, Price Supports, Participation, and Payment Rates

(www.ers.usda.gov/Briefing/FarmPolicy/data/Provisions.xls) contains program parameters for individual commodities.

CCC Net Outlays by Commodity and Function

(http://www.fsa.usda.gov/Internet/FSA_File/ccc2_msr2007_table35pdf.pdf) provides total Commodity Credit Corporation expenditures by commodity.

U.S. and State Farm Income Data (include calendar-year data on direct government payments)

Direct government payments, history (www.ers.usda.gov/data/FarmIncome/finfidmu.htm#payments)

Latest forecast (www.ers.usda.gov/Briefing/FarmIncome/Data/GP_T7.htm)

Price Support Loan and LDP Activity Report

(<http://www.fsa.usda.gov/FSA/webapp?area=home&subject=prsu&topic=psr>) includes data on year-to-date and the previous 4 years of marketing loan and loan deficiency payment expenditures.

U.S. WTO Domestic Support and Support Reduction Commitments

(www.ers.usda.gov/briefing/FarmPolicy/usnotify.htm) summarizes the U.S. domestic support notifications to the WTO.

Appendix table 1

World cotton supply and disappearance, 1990/91-2006/07

Year beginning August 1	Harvested area	Yield	Production	Mill use	Exports	Ending stocks	World price
	1,000 acres	Pounds/acre		--- 1,000 480-lb. bales ---			Cents/ pound
1990	81,941	510	87,141	85,524	29,560	27,449	82.9
1991	85,956	532	95,295	86,192	28,249	36,957	63.0
1992	80,658	490	82,307	86,332	25,475	34,447	57.7
1993	75,884	491	77,646	85,550	26,660	27,691	70.6
1994	79,660	520	86,254	84,513	28,157	31,892	91.8
1995	88,877	506	93,723	85,790	27,361	40,005	85.5
1996	83,349	518	90,032	87,764	26,838	44,597	78.6
1997	83,468	530	92,234	87,267	26,722	49,351	72.2
1998	81,222	505	85,501	84,760	23,524	52,162	58.9
1999	79,727	528	87,719	91,058	27,195	50,206	52.9
2000	79,074	539	88,849	92,158	26,258	48,230	57.3
2001	83,364	569	98,745	94,298	29,060	53,702	41.8
2002	75,244	563	88,251	98,280	30,322	44,217	55.7
2003	79,655	574	95,267	98,030	33,220	43,031	69.2
2004	88,398	654	120,394	108,819	35,025	54,092	53.5
2005	85,084	644	114,142	115,799	44,698	54,328	57.1
2006E	85,424	655	116,560	121,348	39,980	52,922	1/ ^{1/}

^{1/}USDA is prohibited by law from publishing cotton price projections.

Source: *World Agricultural Supply and Demand Estimates*, World Agricultural Outlook Board, USDA and *Cotton and Wool Yearbook*, Economic Research Service, USDA.

Appendix table 2

U.S. upland cotton supply and disappearance, 1990/91-2006/07

Year beginning August 1	Harvested area	Yield	Production	Mill use	Exports	Ending stocks	World price
	1,000 acres	Pounds/acre		--- 1,000 480-lb. bales ---			Cents/ pound
1990	11,505	632	15,147	8,592	7,378	2,262	67.1
1991	12,716	650	17,216	9,548	6,348	3,583	56.8
1992	10,863	694	15,710	10,190	4,869	4,456	53.7
1993	12,594	601	15,764	10,346	6,555	3,303	58.1
1994	13,156	705	19,324	11,109	8,978	2,588	72.0
1995	15,796	533	17,532	10,538	7,375	2,543	75.4
1996	12,632	700	18,413	11,020	6,399	3,920	69.3
1997	13,157	666	18,245	11,234	7,060	3,822	65.2
1998	10,449	619	13,476	10,254	4,010	3,836	60.2
1999	13,138	595	16,294	10,055	6,303	3,665	45.0
2000	12,884	626	16,799	8,738	6,303	5,879	49.8
2001	13,560	694	19,603	7,592	10,603	7,120	29.8
2002	12,174	652	16,531	7,170	11,266	5,140	44.5
2003	11,826	723	17,823	6,204	13,220	3,384	61.8
2004	12,809	843	22,505	6,629	13,645	5,482	41.6
2005	13,534	825	23,260	5,837	17,437	5,981	47.7
2006E	12,408	811	20,973	4,955	13,800	8,190	1/ 47.7

^{1/} USDA is prohibited by law from publishing cotton price projections.

Source: *World Agricultural Supply and Demand Estimates*, World Agricultural Outlook Board, USDA and *Cotton and Wool Yearbook*, Economic Research Service, USDA.