



**INTERNATIONAL COTTON ADVISORY COMMITTEE**  
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## COMMODITY PROFILE: COTTON

### THE ICAC

The International Cotton Advisory Committee (ICAC) is one of the twelve intergovernmental commodity groups and sub-groups supported by FAO. The ICAC is an association of governments having an interest in the production, export, import, and consumption of cotton. It is an organization designed to promote cooperation in cotton affairs, particularly those of international scope and significance. It affords its members a continuous understanding of the world cotton situation and provides a forum for international consultation and discussion. The Committee has consultative status with the United Nations and its specialized agencies and cooperates closely with other international organizations in matters of common interest. The ICAC cooperates with the CFC on cotton projects.

The Committee is the outgrowth of an International Cotton Meeting held in Washington, D.C., in September 1939. There are currently 42 member governments. At the invitation of a member government, plenary meetings of the Advisory Committee are held each year. The official languages of the ICAC are Arabic, English, French, Russian and Spanish. A Standing Committee, consisting of representatives of all member governments convening in Washington, D.C. gives continuity to the activities of the International Cotton Advisory Committee between plenary meetings. The Secretariat of the Committee is located in Washington, D.C., and is composed of an international staff headed by an Executive Director. The Secretariat assists the Committee in carrying out its work program by developing and publishing statistics and analyses of the world cotton situation, by carrying out a program of work to disseminate information on cotton production research, by cooperating with other organizations to promote a sound world cotton economy and by facilitating discussions on matters related to cotton prices.

### INTRODUCTION

The cotton plant is a perennial tree that is grown as an annual crop. Cotton is a warm climate crop, a sun-loving plant but not a water-loving plant. Most cotton is cultivated between 37°N and 32°S, and about 90% of cotton is grown in the Northern Hemisphere. The most commonly cultivated species is *Gossypium hirsutum* ("upland" cotton); *Gossypium barbadense* (extra long staple cotton) accounts for 3% of world production. The cotton plant is naturally vulnerable to a variety of insect pests.

### THE ECONOMIC IMPORTANCE OF COTTON

Cotton is one of the most important and widely produced agricultural and industrial crops in the world. Cotton is grown in more than 100 countries and it is estimated that the crop is planted on about 2.5% of the world's arable land, making it one of the most significant in terms of land use after food grains and soybeans. Cotton is also a heavily traded agricultural commodity, with over 150 countries involved in exports or imports of cotton.

More than 100 million family units are engaged directly in cotton production. When family labor, hired-on farm labor and workers in ancillary services such as transportation, ginning, baling and

storage are considered, total involvement in the cotton sector reaches one billion people. It also provides employment to millions of persons in allied industries such as agricultural inputs, machinery and equipment, cotton seed crushing and textile manufacturing. Cotton cultivation contributes to food security and improved life expectancy in rural areas of developing countries, in Africa, Asia and Latin America. Cotton played an important role in industrial development starting in the 17<sup>th</sup> century and continues to play an important role today in the developing world as a major source of revenue. Cotton plays a major role in the economic development in Africa. 35 of the 53 African countries produce cotton and 22 are exporters. The value of world cotton production is estimated at \$24 billion in 2002/03.

Cotton, unique among agricultural crops, provides food and fiber. A cellulosic fiber about 96% pure, cotton is one of the world's most important textile fibers, accounting for more than half of all the fibers used in the clothing and household furnishing. Cotton is also used in industrial fabrics, and the by-products derived from cotton seed and stalks provide edible oil for human consumption and soap, industrial products, firewood and paper and high protein animal feed supplements. Cotton oil is the fifth edible oil consumed in the world.

## PRODUCTION

The world cotton industry has experienced dramatic changes over the last five decades, as production has more than tripled, rising from 6.6 million tons in 1950/51 to a record of 21.5 million tons in 2001/02. The average annual rate of growth in world production over the last five decades has been about 2% per year. Growth in cotton production was steady during the 1950s and 1960s but slowed during the 1970s because of slower world economic growth and limited gains in cotton yields. World cotton production exploded from 14 million tons in the early 1980s to 19 million tons in 1984/85, as market incentives and the widespread use of better seed varieties and better methods of plant protection led to increased yields. World production climbed to a record of nearly 21 million tons in 1991/92 but leveled off during the 1990s.

World area dedicated to cotton has fluctuated since 1950/51 between 28 million hectares and 36 million hectares, using about 2.5% of the world's arable land. While there have been dramatic reductions in cotton area in some regions since the 1950s, particularly in the USA, North Brazil and North Africa, there have been equally dramatic increases in Francophone Africa, Australia, India, Pakistan and the Middle East. With area showing no tendency to rise, all the growth in world cotton production in the last half of the twentieth century has come from improved yields. The world cotton yield fifty years ago was 230 kilograms per hectare. Yields rose steadily at an average rate of more than 2% per year during the 1950s and 1960s, and then grew more slowly from the mid-1970s until the mid-1980s. During the 1980s the world cotton yield rose dramatically and reached a record of nearly 600 kilograms per hectare in 1991/92. However, yields stagnated during the 1990s due to problems associated with diseases, resistance to pesticides, and disruption of production due to economic reasons.

Cotton is produced in about one hundred countries, but production has traditionally concentrated in a few of them. Over the last three decades, the four leading producing countries have accounted for an increasing share of world production. China (Mainland), the United States, India and Pakistan accounted for 48% of world production in 1970/71 and 66% in 2002/03. The share of Industrial countries (the USA, United States, Australia, Spain and Greece) increased from 19% of world production in 1980/81 to 23% in 2002/03. Developing countries accounted for 61% of world production in 1980/81 and 68% in 2002/03. Cotton production in the former USSR declined during the last two decades, accounting for 19% of world production in 1980/81 and 8% in 2002/03.

New technologies, more extensive use of existing technologies, and new areas dedicated to cotton cultivation, have changed the structure of the world cotton market since the mid-1990s and contributed to promote world production since 1997/98. The world average yield climbed to a record of 644 kilograms per hectare in 2002/03. Among the new technologies, the most

visible is genetic engineering of cotton. It is estimated that 21% of world cotton area was planted to genetically engineered (GE) varieties in 2003/04, up from just 2% in 1996/97. GE cotton lowers the use of insecticides and, although it does not guarantee that cotton yields will be higher than with a non-GE variety, it might lower the cost of production. The use of new area dedicated to cotton production has also contributed to increased world production. New cotton areas in high-yielding Xinjiang, China (Mainland), Mato Grosso, Brazil, and Southeast Turkey contributed significantly to the increase in world production since the mid-1990s. Another factor that promoted cotton production despite relatively low prices was the appreciation of the U.S. dollar between 1995 and 2001, which partly offset declines in prices in countries where the currency devaluated, making cotton prices in domestic currency more attractive.

Production in China (Mainland), the largest producer, increased at an average annual rate of 5% during the 1980s and fluctuated within a range of 3.7 to 5.7 million tons during the 1990s. In the United States, cotton production increased from 2.4 million tons in 1980/81 to 3.3 million tons in 1990/91, and fluctuated between 3 and 4.3 million tons during the 1990s. Cotton production in India rose from 1.3 million tons in 1980/81 to a record 3.0 million in 1996/97. Thereafter, production fluctuated downwards to 2.3 million tons in 2002/03. Production in Pakistan expanded rapidly during the 1980s, growing from 700,000 tons in 1980/81 to 2.2 million tons in 1991/92. However, production fell in 1992/93 and has remained well below the 1991/92 level since. In Africa, cotton production increased from 1.3 million tons in 1990/91 to a record 1.8 million tons in 1997/98, but low cotton prices have prevented production in that continent from surpassing that level in the last six years. Francophone countries in West and Central Africa produced 1 million tons in 2002/03, accounting for 56% of production in the continent. Cotton production in Brazil declined rapidly between the mid-1980s and the mid-1990s, and recovered in the second half of the decade. Production, which declined from 965,000 tons in 1984/85 to 310,000 tons in 1996/97, climbed back to 940,000 tons in 2000/01. Production in Brazil is expected to increase to 1.3 million tons in 2003/04, surpassing Uzbekistan and Turkey. Cotton production in Turkey increased from 650,000 tons in 1990/91 to 900,000 tons in 2002/03. Cotton production in Australia increased very rapidly during the 1980s and 1990s, from 100,000 tons in 1980/81 to 800,000 tons in 2000/01. Because of drought, production dropped in 2002/03 to 380,000 tons. Cotton production in the European Union (EU) increased from 300,000 tons in 1990/91 to 475,000 tons in 2002/03.

The structure of world production varies substantially from country to country and even from region to region in the same country, depending on relative resource endowments. Countries with abundant capital, sophisticated systems of research and education and developed infrastructure for the supply of credit and inputs to farmers tend to rely on highly mechanized production systems utilizing purchased planting seeds and chemical inputs and employing very little labor per ton of output. Australia and the USA typify this production system, and the structure of production in the EU and Brazil is tending in this direction. Developing countries with relatively abundant and less intensively developed networks for the distribution of inputs tend to plant, cultivate and harvest cotton by hand and to use fewer purchased inputs per ton of production. In China (Mainland), Central Asia, South Asia, the Middle East, Africa and many areas in South America Cotton is tended mostly by hand. About 55% of world cotton area is irrigated, accounting for about 75% of world output. About 30% of cotton production is machine harvested. As a result, yields and costs of production vary greatly from country to country.

## CONSUMPTION

World cotton consumption has risen at an average rate of 2.2% per year over the last fifty years. Consumption of cotton more than doubled from 7.6 million tons in 1950/51 to 18.5 million tons in 1998/99. Between 1982 and 1988, world cotton consumption increased by 4 million tons, and then stagnated between 1989 and 1997. Over the last four years cotton consumption increased by 2.7 million tons, an average increase of 3.4% per year. The rapid increase in cotton consumption is mainly the result of low cotton prices relative to prices of competing

fibers. Most cotton is used in apparel and home furnishings and an estimated 10% is used in industrial applications and about 6% is used in padding and other non-textile applications. In 2003, industrial countries as a group accounted for 44% of world cotton end-use, developing countries accounted for 52%, and 4% was used in Eastern Europe and the former USSR. At the retail level, the USA is the largest consuming country.

Mirroring end-use consumption, world mill consumption of cotton was stagnant during the first half of the 1990s, growing by only 0.6% between 1990 and 1997, but increasing rapidly thereafter. In the early 1990s, mill consumption of cotton declined dramatically in Eastern Europe and the former USSR from 2.5 million tons in 1990/91 to 730,000 tons in 1998/99, offsetting gains elsewhere in the world. Mill consumption of cotton in that group of countries recovered to over 900,000 tons in 2002/03. Mill consumption of cotton in industrial countries remained at about 4 million tons during the early 1990s, but declined rapidly since 1998/99 to 2.8 million tons in 2002/03. High labor costs and increased competition of imports from developing countries have caused the cotton textile industries in many industrial countries to decrease production levels since 1998/99. In contrast, mill consumption of cotton in developing countries increased at an annual rate of growth of 2.9% during the 12 years to 2002/03. Mill consumption of cotton in developing countries increased at an annual rate of 3.9%, from 8.5 million tons in 1980/81 to 12.3 million tons in 1990/91. Growth of mill consumption decelerated during first seven years of the 1990s to an average annual rate of 2.7% reaching 14.3 million tons in 1997/98, but regained strength since 1998/99, growing at an average annual rate of 5.5% to reach 17.5 million tons in 2002/03. The bulk of the increase since 1998 occurred in China (Mainland), but important expansions were also registered in Pakistan and Turkey. As a result, the processing of cotton continued to concentrate in developing countries, and their share of world mill consumption rose from 67% in 1990/91 to 83% in 2002/03, compared to 46% in 1970/71 and 28% in 1950/51.

For the past five years, China (Mainland) has been the driving force of the world textile industry. Between 1998/99 and 2002/03, additional mill consumption of cotton in China accounted for 83% of additional consumption worldwide. The Chinese industry processed 6.5 million tons of raw cotton in 2002/03, an increase of 2.2 million tons since 1998/99, and 31% of global mill use, up from 23% in 1998/99. The textile industry in China (Mainland) is highly dependent on the export market, and China (Mainland) has increased its share of world textile and apparel exports in the last four years. During the 1990s, mill consumption of cotton became more concentrated in the largest processing countries. In 1980/81, the six largest processing countries today, China (Mainland), India, Pakistan, the United States, Turkey, and Brazil, accounted for 51% of world mill consumption. These countries accounted for 57% of world mill consumption in 1990/91, 69% in 1997/98 and 72% in 2002/03.

## TRADE

World trade of cotton rose from 2.6 million tons in 1950/51 to 4 million tons in the early 1970s and reached 5.8 million tons in 1986/87. Cotton exports averaged 5.9 million tons during the 1990s and climbed to a record of 6.6 million tons in 2002/03. Among the top 7 cotton producing countries, only Uzbekistan, does not rank among the top 7 consuming countries. Trade accounted for 30% of world cotton production in 2002/03, up from 30% during the previous season. The value of world exports is estimated at \$8 billion in 2002/03.

The rapid expansion of the Chinese textile industry over the last four years has changed the Chinese trading position from net exporter to net importer of cotton, and net imports of cotton by China (Mainland) reached half a million tons in 2002/03. The USA has always been the top exporter in the world, except in 1984/85. Because of the rapid deterioration of the U.S. textile industry in the last five years, U.S. exports represented 69% of domestic production in 2002/03.

The world cotton trade is not highly concentrated by the standards of industrial markets and the international cotton shipping industry is highly competitive. Some 500 firms are engaged, at

least in part, in cotton trade, and the 20 largest cotton organizations handle about one-third of world production.

## THE COTTON MARKET IS DISTORTED

An important factor that promoted increases in cotton production despite relatively low prices was the strengthening of government policies regarding cotton. Direct income and price supports worldwide are estimated by ICAC to have increased from US\$3.8 billion in 1997/98 to US\$5.8 billion in 2001/02. Fourteen countries representing three-fourths of world cotton production offered direct income and price support programs to cotton growers, resulting in higher production and forcing the burden of adjustment to low cotton prices onto growers in countries that do not provide similar measures of protection. Developed countries and China (Mainland) accounted for 86% of assistance provided worldwide. Direct income and price supports worldwide are estimated by ICAC to have declined to US\$3.8 billion in 2002/03. Subsidies boosting production in subsidizing countries have a negative impact on average international cotton prices.

## PRICES

The volatility of cotton prices may be attributable to a number of factors, ranging from weather changes in cotton producing regions to government policies. As with any other commodity, year-to-year changes in cotton prices are driven by changes in supply and demand, expressed as a ratio between stocks and use. However, changes in China (Mainland)'s net trade with the rest of the world have been the major factor explaining year-to-year fluctuations in season-average international prices over the last three decades.

International cotton prices, as measured by the Cotlook A Index, have declined overtime due to more efficient production practices. During the 1950s and 1960s, as production rose while consumption was affected by growth in the use of chemical fibers, cotton prices generally trended lower. The Cotlook A Index, an indicator of world cotton prices, dropped from more than 50 cents per pound in 1950 to less than 30 cents by the end of the 1960s. During the 1970s cotton prices were influenced by the same factors of inflation, rising demand, concerns about trade embargoes and increases in production costs that affected all commodity markets and the Cotlook A Index rose to more than 70 cents per pound. During the ten years to 1985/86 international cotton prices averaged 75 cents per pound. Between 1985/86 and 1994/95, prices averaged 70 cents per pound, and in the eight years to 2002/03, prices averaged 63 cents per pound. Several factors have influenced the decline in long-term average prices, among which are new technologies, more extensive use of existing technologies, and new area dedicated to cotton. During the 1990s, another factor that depressed prices was the strengthening of government policies in various countries. Nevertheless, despite distortions caused by government measures, cotton supply and demand are price-responsive. Average international prices rebounded from a 19-year low of 42 cents per pound in 2001/02 to 56 cents in 2002/03.

When adjusted for inflation, cotton prices have declined since the 1950s. In 2003 US dollars, the Cotlook A Index fell from nearly \$4 per pound in the early 1950s to approximately \$1.2 in the early 1970s. With the rise in commodity prices in the mid-1970s, the Cotlook A Index climbed to more than \$2 per pound but has tended lower in real terms since and collapsed to \$0.43 per pound in 2001/02, the lowest since the invention of the cotton gin in 1793. Despite the increase in average yields, the real average revenue per hectare of cotton has also declined over the last five decades. In 2003 US dollars per hectare at an average world yield, the average revenue from cotton fell from about \$2,000 in the early 1950s to \$1,000 in the late 1960s. In the mid-1970s, the average revenue rose to about \$ 2,400 per hectare but relapsed to \$1,000 during the 1990s and dropped to about \$600 in 2001/02. The average revenue per hectare rebounded to nearly \$800 in 2002/03.

## COMPETITION

World textile fiber consumption increased at an impressive pace, from 9.6 million tons in 1950, to 52 million tons in 2002. Several variables are associated with changes in cotton consumption, including growth in income and population, changes in cotton prices relative to prices of competing fibers consumer preferences and changes in fashion. Fibers competing with cotton include natural fibers and manmade fibers, primarily polyester. Cotton's share of world textile fiber use fell from more than 70% in the 1950s to less than 50% by the end of the 1970s. Cotton did better in the 1980s. However, cotton's share of world textile fiber fell below 40% in 2002. Over the last five decades, cotton experienced an erosion of both price and non-price competitiveness.

Cotton's major advantages over its primary competitors in the chemical fiber complex include wearing comfort, natural appearance, moisture absorbency, its status as a renewable resource and the important economic role of cotton in many producing countries. However, cotton also suffers from several disadvantages relative to chemical fibers, including contamination introduced during harvest, ginning and handling, annual fluctuations in the quantity and quality of production and consequent variability in prices. Cotton also has difficulty meeting the needs of modern spinning equipment for strength, uniformity and other quality parameters.

## FUTURE TRENDS

World production in 2003/04 is estimated at 20.4 million tons in 2003/04, 700,000 tons below consumption. China (Mainland) is anticipated to be a net importer of 1.8 million in 2003/04, and the Cotlook A Index is expected to average 70 cents per pound, the highest since 1997/98. Over the next five seasons, world production and consumption are expected to climb to about 22.5 million tons, without building stocks as during the second part of the 1990s.

New technologies, the development of new areas dedicated to cotton and government measures are expected to continue to support cotton production in the next five seasons. Area dedicated to GE cotton varieties is expected to climb to 40% of world area by 2008/09, accounting for 50% of cotton production. The average world yield is expected to surpass 660 kilograms per hectare. However, weather in the largest producing countries will remain key to global production. Over the next five years, cotton consumption is expected to expand at an annual rate of 1.4%. Consumption in China (Mainland) is projected to climb to 8.6 million tons in 2008/09, 38% of world mill use. Cotton's share of the world textile fiber market is projected to decline to 38%.

Because of the increasing importance of China (Mainland) to the world cotton market, net trade between that country and the rest of the world will continue to play an important role in determining cotton prices. It is expected that imports of raw cotton by China (Mainland) will exceed 1.5 million tons a year over the next five seasons.

World ending stocks are projected to average 43% of global consumption over the next five seasons, down from 53% from 1997/98 to 2001/02. In contrast, the stocks-to-use ratio outside China (Mainland) is expected to average 68% over the next five seasons, sharply up from an average of 40% during the 1990s.

Costs of production worldwide are coming down and competing chemical fibers will continue to put downward pressure on cotton prices. As a result, international cotton prices are expected to remain below 60 cents per pound from 2004/05 to 2008/09.