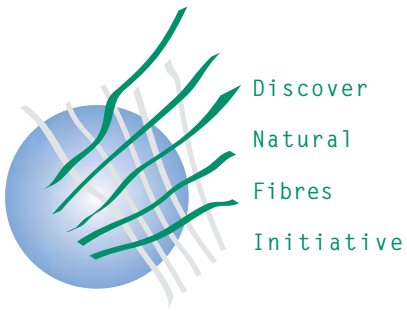

COTTON :
Review of the World Situation

International Cotton Advisory Committee

Volume 70 - Number 2
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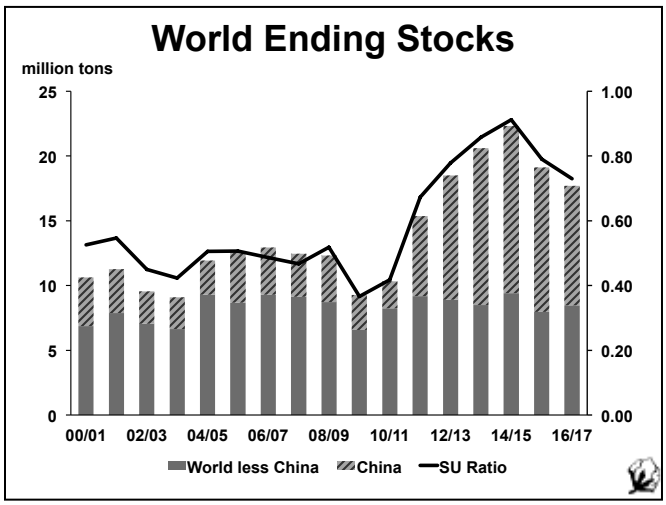
SUMMARY OF THE OUTLOOK FOR COTTON

India Currency Crisis to Have Limited Impact on Global Cotton Markets

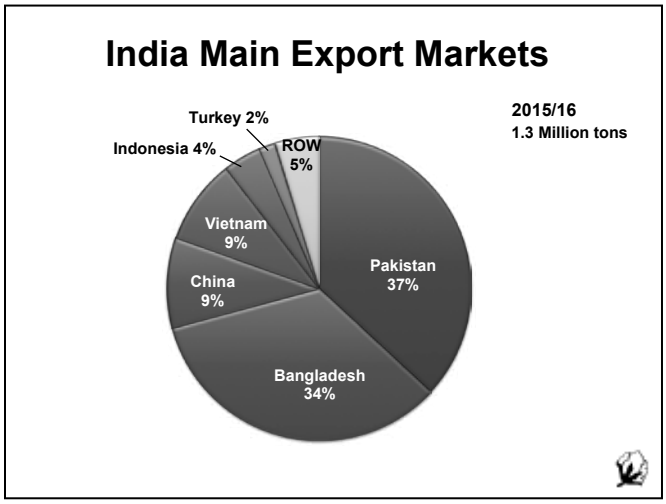
Despite weak global demand for cotton and higher production in 2016/17, international cotton prices have remained elevated, with the Cotlook A Index averaging 79 cents/lb during the first four months of the season. The unanticipated shortfall in production in 2015/16 led to a 14% decline in both world stocks and in stocks outside of China, which pushed prices up at the end of last season. Prices have remained high as the bulk of the 2016/17 crop is only just now reaching the international market. In addition, the currency crisis in India is temporarily exacerbating the situation, since that country is the world's largest producer of cotton and second largest exporter.

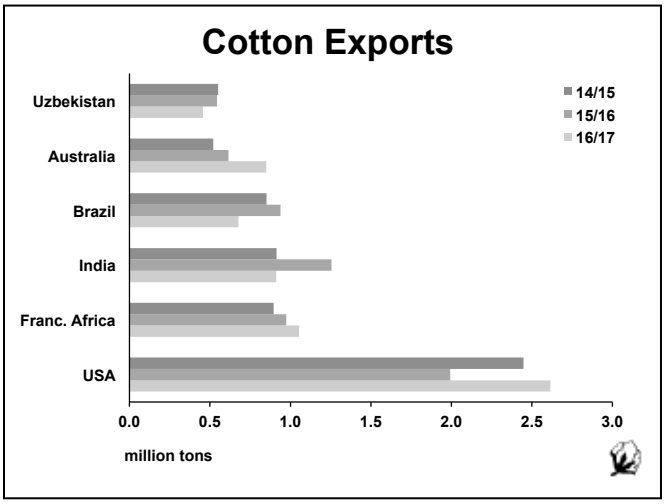


Early in November, the Government of India announced that the existing 500 and 1,000 rupee notes would be taken out of circulation and exchanged for new 500 and 2,000 rupee notes. However, insufficient supplies of the new notes have led to a currency crisis, since much of the Indian economy operates on a cash basis, including payments to farmers. This has led to delays in sales of cotton and shipments to ports, creating shortages in the domestic market as well as reducing supplies to the global market. However, the effect of the crisis will be limited as the crisis is likely to be resolved in the near future.

Due to the delay in Indian cotton reaching the global market, other countries may benefit from increased exports in the short term. Bangladesh is expected to be the largest importer of cotton in 2016/17 for the second consecutive season as its mill use continues to grow, with imports expanding by 1% to 1.4 million tons. In past seasons Bangladesh has imported heavily from India, but may instead use cotton from other countries for its immediate needs. Exports from the United States are projected to increase by 29% to 2.6 million tons, due largely to strong demand and an ample exportable surplus. The sizeable crop anticipated in Australia, the fourth largest exporter, is likely to cause its exports to increase by 21% to 750,000 tons. Exports from Burkina Faso and Mali, the sixth and seventh largest exporters, are expected to increase by 13% to 295,000 tons and by 17% to 255,000 tons, respectively, as a result of larger crops. Cotton from these origins may replace some of India's exports if their crops reach the global market sooner. Indian cotton exports are expected to fall by 34% to 825,000 tons in 2016/17.

After declining by 1% in the previous season, world cotton mill use is expected to remain stable at 24.2 million tons in





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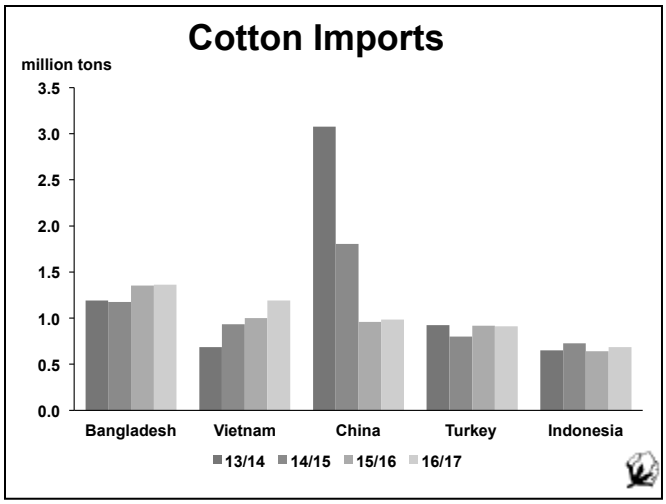
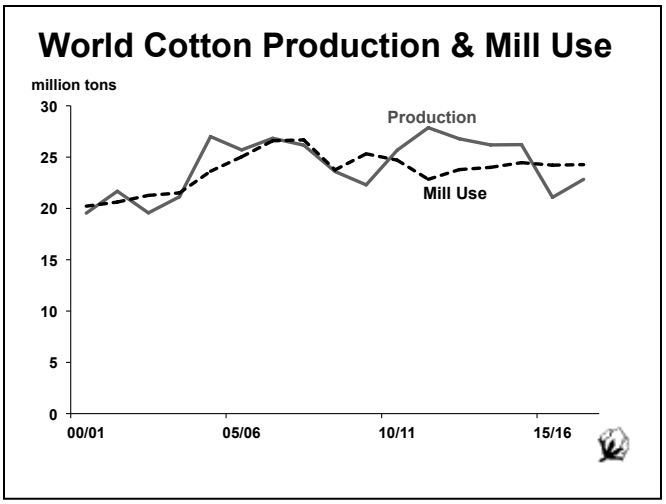




2016/17. High cotton prices competing with low polyester prices led to six seasons of decline in China's mill use. However, China's cotton consumption is projected to remain stable at 7.4 million tons in 2016/17 due to the reduced gap between domestic and international cotton prices. Cotton mill use in India and Pakistan is forecast to remain stable at 5.2 million tons and 2.3 million tons respectively. Higher cotton prices and lower demand for cotton yarn from China have limited growth in cotton mill use in these two countries. Consumption in Turkey, the fourth largest consumer, is projected to fall by 3% to 1.45 million tons due in part to increased competition from lower cost yarn imports.

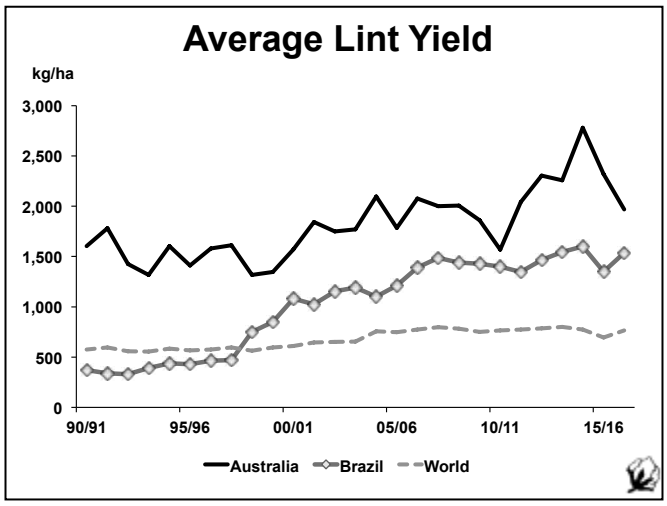
World cotton production is projected to rise by 7% to 22.5 million tons. Although India's cotton area contracted by 8% to just under 11 million hectares, production is unchanged from 2015/16 at 5.8 million tons. The average yield increased by 9% to 526 kg/ha due to improved weather conditions and reduced pest pressure. Output in China, now the world's second largest producer, shrank by 4% to 4.6 million tons. Cotton production in the United States rose by 24% to 3.5 million tons, as area expanded by 20% to 3.9 million hectares and yield improved by 5% to 901 kg/ha. Pakistan's cotton production is estimated up by 24% to 1.9 million tons in 2016/17, as the average yield increases by 41% to 743 kg/ha. Cotton production is forecast to increase by 8% to 1.4 million tons in Brazil, the world's fifth largest cotton producer.

Despite remaining stable, world cotton consumption is forecast to exceed world production by 1.7 million tons, which also contributes to firm cotton prices. Stable mill use in China and restricted imports led to strong demand for cotton sold from the government reserves in 2015/16 and will likely lead to strong reserve sales in 2016/17 as well. As a result, ending stocks in China are forecast to decrease by 17% to 9.2 million tons in 2016/17, which represents 123% of China's projected use this season. Stocks outside of China are forecast to increase by 2% to 8.2 million tons, representing 34% of expected mill use in the world less China in 2016/17.

COTTON PRODUCTION AND YIELDS IN THE SOUTHERN HEMISPHERE

By Rebecca Pandolph, ICAC

Cotton planting or growth is under way in the Southern Hemisphere, which produces between 8 and 10% of the world's cotton. Producers in this part of the world can quickly adjust plantings to changes in the market, due to the fact that their sowing season usually lags a few months behind the Northern Hemisphere, so growers have a much better sense of the size of the world cotton crop and the direction of international cotton prices. While the planted area in the Northern Hemisphere is responsive to world cotton prices during the previous season, area in the Southern Hemisphere tends to be more responsive to prices at the end of the previous season, when the crop is marketed, and the start of the current season. International cotton prices, as measured by the Cotlook A Index, averaged 70 cts/lb during 2015/16. However, in the second half of June, the Cotlook A Index rose to an average of 74.77 cts/lb. In the following month, the A Index continued to climb from 74.85 cts/lb to the high point of 85.35 cts/lb on July 27, 2016. For the first four months of 2016/17, international prices have averaged 79 cts/lb. While the season-average price is projected to decline to 75 cts/lb, they are still above the long-term average of 70 cts/lb.



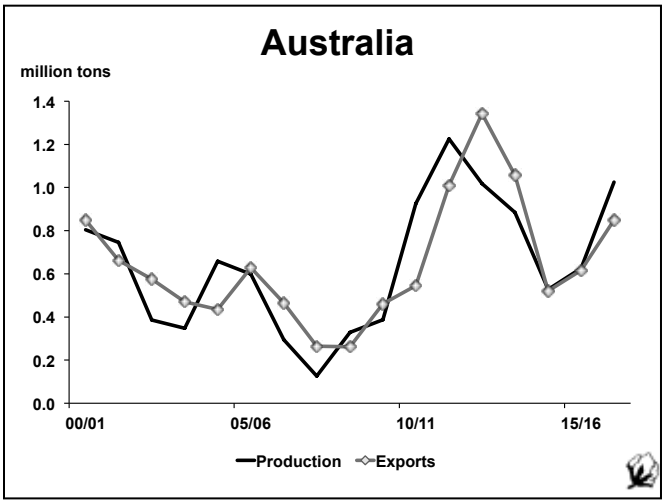
As a result of high international prices and the expectation of better returns, growers in the Southern Hemisphere are expected to increase planted area by 5% to 2.6 million hectares. Much of the production in the Southern Hemisphere occurs in Brazil and Australia, the world's fifth and eighth largest producers, respectively. In 2015/16, production in these two countries was 1.9 million tons, accounting for 83% of production in the Southern Hemisphere and 9% of global cotton production. In 2016/17, production in Brazil and Australia is expected to increase by 27% to 2.4 million tons, accounting for 88% of production in the Southern Hemisphere. Not only do these two countries plant more cotton than most of the other countries in the Southern Hemisphere, but their yields are significantly higher. From 2013/14 through 2015/16, Australia had the highest national lint yield in the world, averaging 2,452 kg/ha, while Brazil's was the sixth highest, averaging 1,499 kg/ha. In comparison, the world average yield was 755 kg/ha during the same period, while the average yield for the Southern Hemisphere countries except Australia and Brazil was 334 kg/ha.

Major Producers in the Southern Hemisphere

Australia

Cotton is planted on the eastern side of Australia, in the states of Queensland and New South Wales, and sowing generally starts in September and runs through November. Around 99% of Australia's production is exported, nearly all of which to Asia. The cotton area in New South Wales has expanded further southward, close to the border of the southeastern state of Victoria, due to new cotton varieties, agronomic practices and favorable weather and market conditions. High average yields allow farmers in Australia to remain profitable even when prices fall, as was the case in 2014/15 and 2015/16. Instead, water availability tends to have a more significant impact on cotton area, since irrigation contributes significantly to Australia's high yields. However, when cotton prices are high, farmers that grow cotton mostly under rainfed conditions will devote more area to cotton, which can reduce the national average yield. Given that most of the cotton crop is irrigated, water availability has a significant impact on the amount of area planted with cotton in Australia. From late 2006 until 2011, Australia's cotton belt suffered from drought conditions, and the planted area, impacted by both drought and low world prices in autumn 2007, reached a record low of 63,000 hectares in 2007/08. Drought conditions ended in 2012, and Australia achieved an average yield of 2,303kg/ha in 2012/13, producing just over one million tons despite a 26% reduction in area from the previous season.

In 2013/14, the area under cotton contracted by 11% to 382,000 hectares, due to dry weather and low soil moisture. The average lint yield under irrigated conditions was 2,400 kg/ha, compared to 560 kg/ha under rainfed conditions. Around 10% of area that season was rainfed, while the remaining area used some system of irrigation, though the majority of farms (68%) used furrow irrigation, with approximately eight mega liters of water applied per hectare. As a result, cotton production in 20134/14 reached 885,000 tons.



Dry conditions during planting, reduced levels of water for irrigation, and the fall in international cotton prices led to a 50% drop in cotton area to 197,000 hectares in 2014/15. However, yield improved by 19%, to a record 2,680 kg/ha, due to the fact that nearly all planting was for higher-yielding irrigated cotton. Due to higher yields, the reduction in output was limited to 43%, resulting in a total volume of 505,000 tons in 2014/15.

At the end of August 2015, irrigation water levels were at 37% of capacity, which is similar to the supply at the same time in the previous year and slightly below the ten-year average of 40%. Record yields achieved in 2014/15, adequate rainfall during the planting window, and expectation of better returns compared to competing crops, such as sorghum and soybeans, encouraged farmers to plant cotton in 2015/16 with significant increases in dryland area compared to the previous three seasons. The total cotton area in 2015/16 expanded by 37% to 270,000 hectares. The average yield in Australia declined by 20%, to 2,144 kg/ha, due to the significant increase in dryland area, representing around 33% of total area in 2015/16. Total cotton production increased by 10% to 579,000 tons.

Cotton prices during the sowing period for 2016/17 were significantly higher than in the previous season, encouraging farmers to plant more cotton. Cotton area in 2016/17 is projected to expand by 76%, to 475,000 hectares, of which 71% will be irrigated due to the fact that the storage level of public irrigation dams has increased significantly compared to a year ago. La Niña-like conditions and a strong negative phase of the Indian Ocean Dipole led to wetter growing conditions in the months leading up to cotton planting. The rainfed cotton area also increased significantly, and the national average yield is expected to decline by 14%, to 1,844 kg/ha, resulting in a total production volume of 876,000 tons. Production in New South Wales is forecast to increase by 62% to 637,000 tons, representing 62% of Australian cotton production. The average yield for this region is expected to decline, as dryland area more than doubled to 80,000 hectares, accounting for 26% of cotton area in New South Wales. Cotton production in Queensland is projected to increase by 70% to 393,000 tons as area nearly doubled to 208,000 hectares, of which 70,000 hectares is dryland cotton.

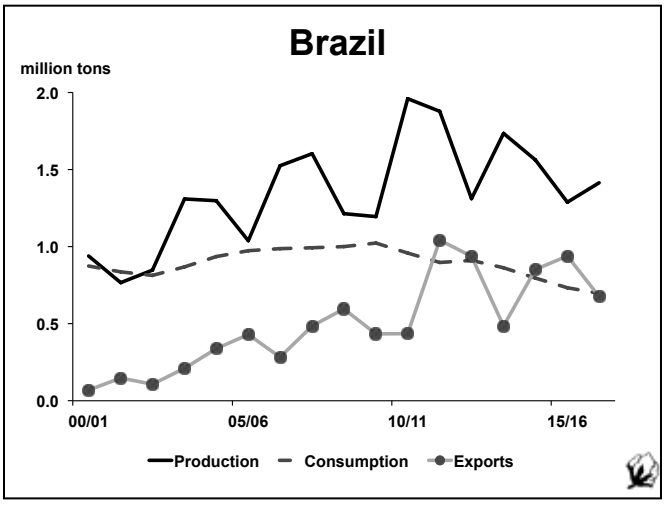
In addition to irrigation, new seed technology has also contributed significantly to the high yields in Australia. Cotton seed varieties are developed by the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) cotton plant breeding program, which is conducted in cooperation with Cotton Australia and the Cotton Research and Development Corporation. Nearly all cotton planted is of genetically modified varieties, the first of which was developed twenty years ago. The rapid adoption of research by cotton growers, through partnerships among industry groups, researchers, growers and extension officers, has also contributed to higher yields. Successful extension methods include field trials, printed materials and decision management tools for integrated pest management, and deployment of tactics for resistance management when genetically modified insecticidal cotton was introduced.

Nearly all of Australia's crop is exported and 850,000 tons is forecast to be exported in 2016/17. In 2015/16, China was the main destination for Australia's crop, importing around 44% of the crop compared with 50% in 2014/15. Vietnam's share of Australia's exports increased from 12% to 14% in 2015/16. India accounted for 12% of Australia's exports in 2015/16 while Indonesia accounted for 10%. Exports through September 2016 indicate that these three countries will continue to be the main destinations for Australian exports, although Bangladesh also purchased a significant volume in the first two months of 2016/17.

Brazil

Brazil is split between the Northern and Southern Hemispheres, with around 96% of production occurring in the Southern Hemisphere in recent seasons. Late sowing of the soybean crop that is planted before a second crop of cotton, low international prices and increased input prices discouraged farmers in Brazil from planting cotton, and area decreased 9% to 1 million hectares. Production in Brazil fell by 10% in 2014/15 to 1.6 million tons, but yield advanced by 4% to 1,601 kg/ha. Low international prices, drought in some regions and increased input prices due to the depreciation of the Brazilian real discouraged farmers in Brazil from planting cotton, and area decreased 2% to 955,000 hectares in 2015/16. The dry weather, pest pressure and late sowing of cotton reduced the national average yield by 16% to 1,350 kg/ha. As a result production in Brazil fell by 18% in 2015/16 to 1.3 million tons, which is the lowest since 2009/10.

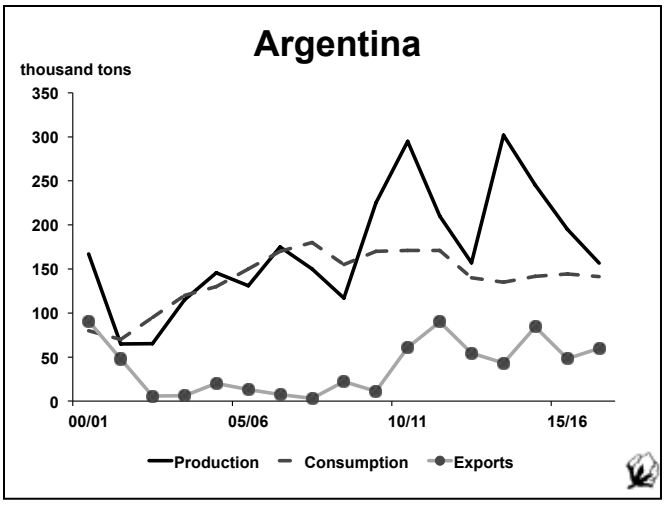
In 2016/17, cotton area is forecast to contract by 4% to 920,000 hectares, as farmers were discouraged by poor returns last season and, in some regions, attracted by more competitive soybean prices. However, the average yield is expected to recover by 14%, to 1,527 kg/ha, due to improved weather. In addition, cotton farmers have been able to secure financing



from banks more readily than in the previous season, which makes obtaining the inputs used to improve productivity easier. Despite the significant fall in yield in 2015/16, it was still the sixth-highest in in the world and is expected to maintain this position in 2016/17. Cotton plantings are concentrated in Mato Grosso and Bahia, where soil and climate conditions are better. Mato Grosso is the largest producing state in Brazil and is located in its Cerrado region. Production is expected to increase by 6% to 933,000 tons in 2016/17, accounting for 66% of Brazil's total output. Bahia is the second largest producer in Brazil and its cotton area is expected to fall by 14% to 202,000 hectares as adverse weather and high production costs last season led to poor returns. In order to encourage production, several projects have been undertaken, including a drip irrigation project developed by the Bahian Association of Cotton Producers. Assuming the average yield in Bahia improves, production could increase by 25% to 309,000 tons, which would represent 22% of Brazil's total output.

Unlike Australia, all cotton grown in Brazil's semiarid region and 95% of the crop grown in its Cerrado region is rainfed. Around 5% of the area in the Cerrado region in 2013/14 was irrigated by sprinklers, using around 1,260 cubic meters of water per hectare. Increases in productivity of cotton in Brazil were achieved during different periods in various regions due to the interaction of the cotton-growing environment, seed varieties, and crop management practices. Brazil's cotton breeding program has also greatly enhanced yield and production. Like Australia, seeds are supplied locally and Brazil has used genetically modified seed for around twenty years, which has greatly improved the management of weeds and insects. Brazil's temperature and soil humidity during its cotton-growing season is favorable to weeds, so cotton seed that is tolerant to herbicide has helped to improve yield as part of an integrated weed management program. Cotton farmers in Brazil have also increasingly used nitrogen over the last 15 to 20 years, which has also contributed to higher yields in Brazil. Nitrogen is an indispensable nutrient and the most commonly used nitrogenous fertilizers include ammonia, urea, ammonium nitrate, ammonium sulfate, and nitrogen solutions. Nitrogen use has mostly reached its peak in cotton production and the key future target to be achieved is to improve the efficiency of its use.

Brazil usually ranks among the top five exporters of cotton, and is expected to ship 677,000 tons in 2016/17, which would make it the third largest. China's share of Brazil's exports fell from 20% in 2014/15 to 11% in 2015/16. Vietnam and Indonesia were the top two destinations for Brazil's crop in 2015/16, each importing around 15% of the crop. South Korea and Turkey accounted for 13% of Brazil's exports. Exports through October 2016 indicate that these four countries will continue to be the main destinations for Brazil's exports in 2016/17.

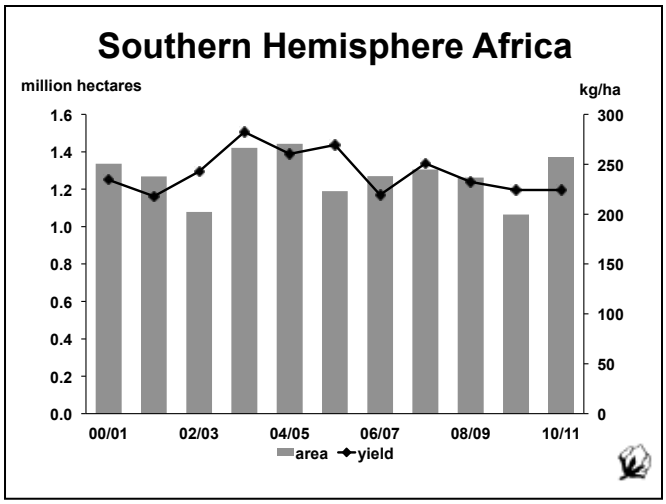


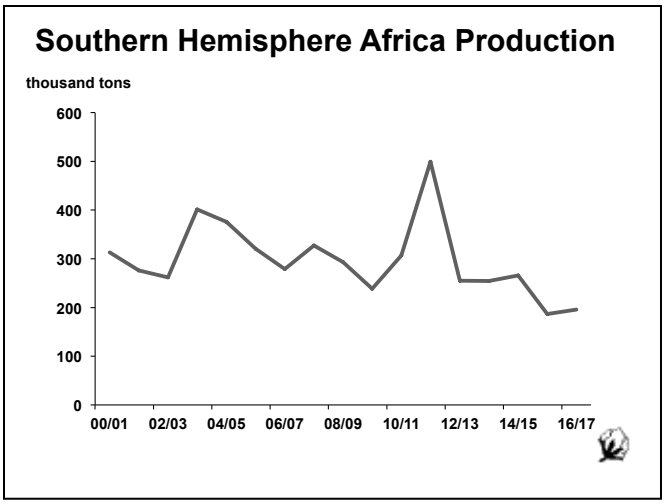
Argentina

While consumption has grown in Argentina, its production volume is sufficient to make the country a net exporter of cotton in most years. However, this also makes the Argentinian crop sensitive to international prices. After the sharp decline in prices in 2014/15, cotton production in Argentina declined to 245,000 tons on an area of 456,000 hectares. Low international cotton prices, better returns for competing crops and losses from the boll weevil in the previous season discouraged farmers from planting in 2015/16 and cotton area contracted by 18% to 380,000 hectares and production fell by 20% to 195,000 tons. The majority of cotton in Argentina is grown in the rainfed upland provinces, including Chaco and Formosa, and weather during planting has been largely favorable with adequate rain and warm temperatures. However, rising costs of production, particularly as a result of the depreciation of the Argentine peso, and improved prices for soybeans and maize may discourage farmers from expanding cotton area. Additionally, the appearance of boll weevil in some areas previously declared free of the pest deterred many small farmers from planting cotton. Total production is projected down by 20% to 157,000 tons, assuming an average yield of 522 kg/ha.

Southern Hemisphere Africa

Aside from a few seasons in the mid-1990s when area fell below one million hectares, area in Southern Hemisphere Africa has ranged between one and two million hectares, averaging around 1.2 million hectares. However, area contracted by 6% to 818,000 hectares in 2015/16 due to low prices, competition from other crops and unfavorable weather. Yields in the region have remained low, averaging 244 kg/ha over the last twenty years, as most of the region's farmers do not use irrigation and securing adequate quantities of quality inputs can be difficult. After reaching a record in 2011/12, area has contracted in each of the subsequent seasons and is expected to fall by 1% to 809,000 hectares in 2016/17. Despite high international prices, many growers may be less enthusiastic





about planting cotton this season due to high production costs and poor returns last season. After declining by 13% to 228 kg/ha, the regional average yield may increase by 6% to 242 kg/ha. As a result, production is forecast to increase by 5% to 195,000 tons. In 2015/16, area in Tanzania decreased by 10% to 315,000 hectares as excessive rains caused a delay in planting, and farmers switched to food crops in some cases. In addition, persistently low prices and a breakdown in the contract farming system discouraged farmers from planting cotton. Tanzania is expected to maintain production at 68,000 tons, making it the largest producer in the region. Zambia's area under cotton declined by 4% to 122,000 hectares in 2015/16. Late rains delayed the planting of cotton and threatened yield prospects, which discouraged any expansion of the cotton area this season. The national average yield fell by 6% to 350 kg/ha, and production decreased by 10% to 43,000 tons. The cotton area in Zambia is expected to remain stable at 122,000 hectares in 2016/17 with production reaching 4,000 tons, unchanged from last season. Zimbabwe is generally one of the three largest producing countries in Southern Hemisphere Africa, but its production dropped 73% to 12,000 tons in 2015/16, due in part to a severe drought leading to low yields as well as the breakdown in its contract farming system. Production could recover by 54% to 18,000 tons in 2016/17 due to improved yields.

Conclusion

As a consequence of high international prices and the expectation of better returns, growers in the Southern Hemisphere are expected to increase planted area by 5% to 2.6 million hectares and production is projected to rise by 21% to 2.8 million tons. Much of the production in the Southern Hemisphere occurs in Brazil and Australia, respectively the world's fifth- and eighth- largest producers. High yields have allowed Brazil and Australia to earn better returns on cotton and maintain high levels of production despite losses in area in some seasons. Good crop management and research, particularly for seed varieties suitable to their cotton growing regions, have contributed greatly to the high yields in these two countries. In addition, irrigation is an important factor in not only the quantity of cotton is planted in Australia, but also its yields. In contrast, Brazil's cotton production relies mainly on rain for its water requirements. However, its climate is generally more humid and productivity tends to be more harmed by problems stemming from this type of environment, such as greater pest pressure and fungal diseases.

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PROCALGODON

By Ing. Agr. Diana Piedra, Director Chaco-Formosa Regional Center, INTA (Argentina)

PROCALGODON, the Program of Argentina's Ministry of Agro-industry that focuses on the Assistance for the Improvement of Cotton Fiber Quality, aims to improve the production and technological process of cotton, from planting to delivery of the baled lint to the domestic and international markets. The program contributes to adding value to the product based on quality, improving traceability and enhancing the domestic cotton sector's competitiveness.

In 2006, MINAGRO, along with various public institutions, organizations and representatives of the private sector, drafted a document containing the objectives, characteristics, and scope of the program, after an exhaustive diagnosis of the cotton sector.

Later, and based on the initiatives that emerged from the International Seminar-Workshop "Marketing of Cotton Fiber in US and Argentina", held at Resistencia, Chaco, in August 2008, and on work proposals from the *ad-hoc* committee, the Chaco-Formosa Regional Center of INTA (National Agricultural Technology Institute) was designated, by a Technical Cooperation Agreement, as responsible for coordinating the implementation of pilot experiences to evaluate operationally the proposal from MINAGRO as a step prior to launching the PROCALGODON program in the country.

It is worth mentioning that activities related to certifying and enabling laboratories, software development, and marketing were initially carried out by other institutions (INTI-National Institute of Industrial Technology) and/or working groups (private consultants).

Thus, the Pilot Tests (PT), carried out from 2008/09 and up to the current 2015/16 season, had the objective of demonstrating the feasibility of implementing a certification system for cotton fiber quality in Argentina.

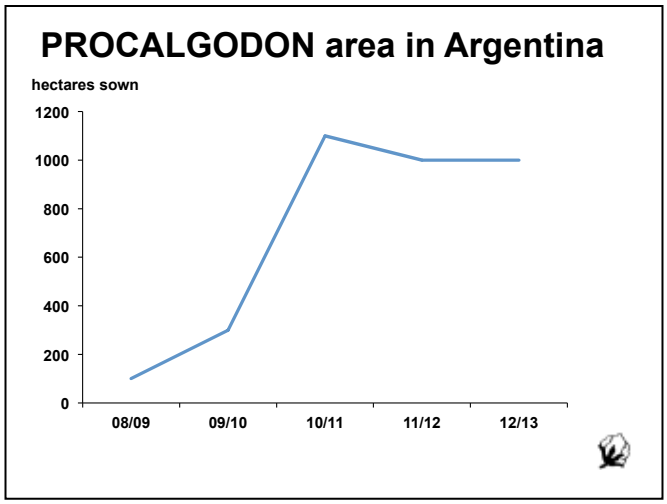
From the beginning, the PT largely covered the cotton-growing regions of Santiago del Estero, Corrientes, Santa Fe, Formosa and Chaco Provinces, including the relevant Regional Centers and Agricultural Experimental Stations of the defined territory, *i.e.* Las Breñas, Saenz Peña, El Colorado, Colonia Benitez, Reconquista, Corrientes, and Santiago del Estero. In later seasons, the province of San Luis was included (Quines Rural Extension Agency).

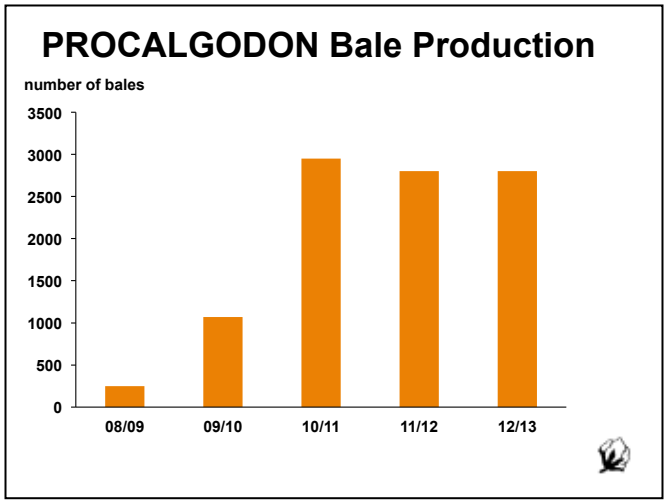
As part of the Program's intervention strategy, field tests were carried out in plots of approximately 10 ha with commercial characteristics of INTA's cooperating institutions and individual farmers, as well as in plots of the cooperatives' farmer partners.

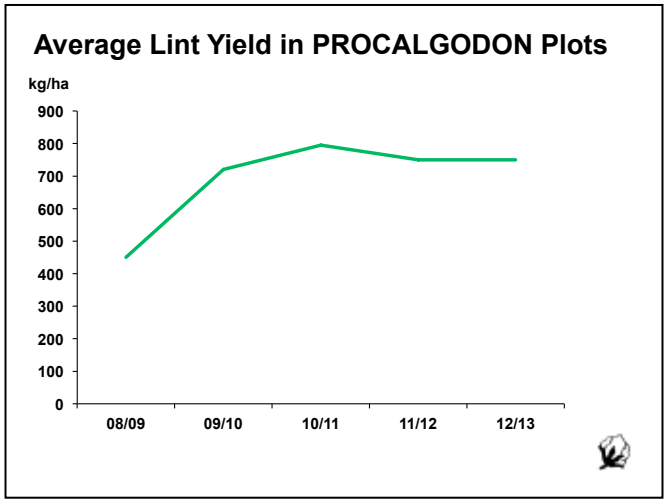
Also, protocols were drafted for crop planting and management, harvesting, transport, and ginning, as well as for sampling the fiber for its grading and subsequent use, and the the seed quality for sowing, fodder, and industry.

In order to verify compliance with crop planting and management protocols, audits of the above-mentioned plots were conducted by professionals from the private sector.

Some results achieved during the experimental seasons







The stages of the Pilot Test process were differentiated as follows:

1. Planting
2. Harvesting and transport
3. Ginning
4. Grading quality parameters

With regard to planting, the minimum area per plot was 10 ha per farmer, EEA cooperating institution or cooperative.

In every case, control seeds were used, and the production process was carried out according to PROCALGODON's Best Management Practices protocol.

Professionals from the private sector evaluated the agricultural process by external audits (through the institutional relationship with the Councils or Associations of Agronomists of the provinces concerned).

The harvesting stage could be manual or mechanical (picker or stripper), and PROCALGODON's protocols for harvesting and transport were applied.

Then, the fiber quality was determined within the traditional grading system (types) and by high-precision instrument analysis.

On several occasions, certified bales were sold to various buyers, as part of a differential value capture strategy. However, sales definitions were first adopted by each of the Cooperative Associations relevant to the Agricultural Experimental Stations.

Of all the PROCALGODON's certified bales, 60% were sold to a spinning mill that reported its performance in the spinning process.

One of the most important findings is that there were no claims from buyers about the quality of the cotton fiber traded.

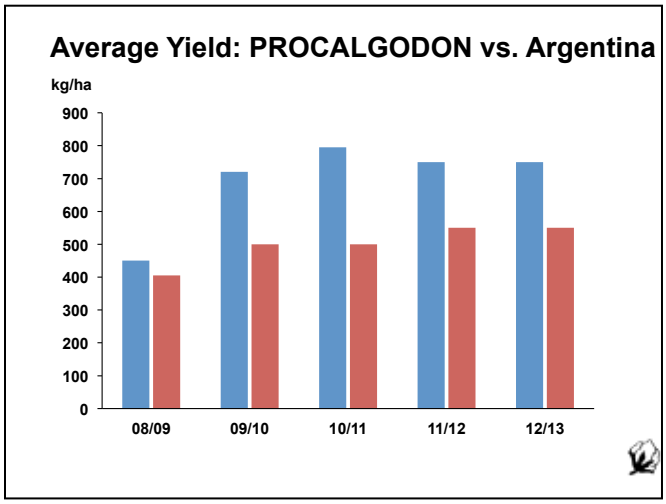
Also, within the PT framework, field trips were made to conduct trials of the harvest systems and to test control methods for boll weevil (bait sticks).

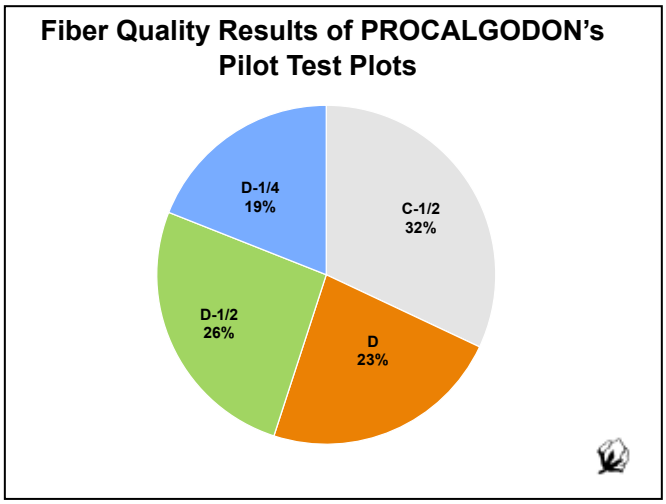
If we take into account the different cotton seasons in which PROCALGODON's Pilot Tests were conducted, the following was achieved:

- 3,529 ha total planted
- 10,223 total fiber bales
- 693 kg/ha average yield

Fields tests for the season 2008/09

Plots	Len	Unf	Str	Elg	Mic	Rd	+b
Sáenz Peña	27.83	82.70	30.30	7.23	4.09	72.24	9.64
Reconquista	26.95	80.57	28.61	6.69	4.87	73.67	10.33
Reconquista	26.69	79.33	26.90	6.12	4.02	73.39	8.19
Formosa	26.26	79.18	26.02	6.25	3.67	72.11	7.90
Santiago	25.44	79.94	25.66	6.50	4.40	67.47	10.09
Corrientes	26.48	79.26	26.73	6.06	3.76	71.01	8.76
Las Breñas	29.15	79.67	29.34	5.85	4.07	70.16	7.49





One of the most interesting results is that PROCALGODON's plots produced between 10% and 56% more fiber than the national average.

With regard to the outcomes in fiber quality, it is worth noting that 80% of the PROCALGODON plots were harvested using the stripper system and achieved results that show 32% of cotton was type C-1/2 and 23% was type D.

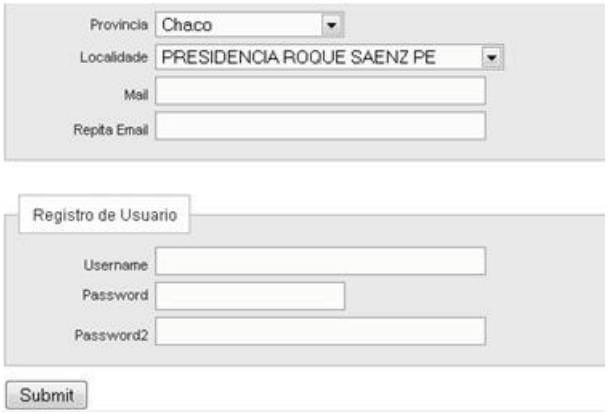
Regarding the technological characteristics, the fiber from the Pilot Tests achieved average length and strength values, and an optimum micronaire level.

Externalities

The use of crop protocols decreased production risk levels; therefore, the Ministries of Production of Chaco, Formosa, and Santiago del Estero adopted the PROCALGODON protocol for their provincial programs.

Within the Pilot Tests framework, new cotton production technologies were tested: narrow rows/growth regulators and currently available harvesting systems (picker and stripper with pre-cleaning).

A software for PROCALGODON bale traceability and marketing was developed as shown below:



Some Final Comments

- Pilot Tests demonstrated that Argentina has the potential to implement a fiber quality certification system.
- The Pilot Test experiences permitted adjustments to be made to the proposal as needed.
- Networking with the various INTA Cotton Experimental Stations facilitated the Pilot Test implementation and monitoring of planned actions.
- Coordinated work with cooperatives was encouraging as it involved small, medium, and even large-scale farmers.
- With regard to the audits, the exchange with professionals of the private sector was promising.
- Increased cotton area within the Pilot Test framework reflects year after year the interest of the production sector in participating in PROCALGODON.

WHAT ARE THE SOURCES OF ICAC STATISTICS?

By Rebecca Pandolph and M. Rafiq Chaudhry, ICAC

Accurate numbers and data are helpful in reaching solid conclusions and making well informed decisions. One of the main functions of the ICAC is to provide statistics on world cotton production, consumption, trade and stocks and to identify emerging changes in the structure of the world cotton market. The technical information work of the ICAC also includes the compilation of data on the costs of cotton production and a variety of production practices, including quantity of fertilizer applied, farm size, soil types, soil preparation, irrigation, ginning and harvesting.

The ICAC Secretariat collects data from many sources, both public and private. The data are as reliable as possible and presented by the Secretariat in an unbiased and professional manner. The data that form the basis of the organization's activities can be divided into two major categories: economics and marketing; and production research. This article explains how the ICAC collects data and presents it to the world cotton industry, with the primary focus on serving its member governments.

Over six years ago, Armelle Gruère, former Statistician of the ICAC, published an article on the sources of estimates of cotton supply and demand in the May-June 2011 issue (Volume 64, Number 5) of *Cotton: Review of the World Situation*, which is the major source of material for information on economics and marketing aspects of cotton in this article. Readers of the *ICAC Recorder* are more interested in technical issues, so only a brief overview of the ICAC's current production, supply and use data is provided here.

Production Research Publications

Three publications of the Technical Information Section of the ICAC depend entirely on data collected from outside the ICAC.

Cost of Production of Raw Cotton

A report, consisting of data, on the cost of cotton production is published every three years. This study is the only source of comparative information on the cost of cotton production in the world. The Secretariat sends out a questionnaire containing requests for information on 34 items, including inputs and operations, units of measurement (ha, kg, liter, number, etc.), quantity applied or used per hectare, cost or price per unit and cost in local currency. In the report, data are presented for each operation and input in local currency and US dollars. Only minor changes have been made to the questionnaire over the years, so the data are quite comparable over time. A major source of data on the cost of production is the ICAC's Coordinating Agencies in member governments. In a few cases, data comes from public sector institutions that are recognized sources of information for their respective governments. Over the years many countries have adopted the ICAC format to collect data, but the data received remains incomplete in some cases. Nonetheless, no third party information is used to complement the data received from Members.

Cotton Production Practices

The report on *Cotton Production Practices* is another triennial publication of the ICAC that is entirely based on information received from a survey questionnaire. This questionnaire has been continuously modified over time, due to changes in the practices employed in the production of cotton and in order to provide more value and information in the report. Unnecessary items have also been excluded, which is not the case with the questionnaire on cost of production. The survey questionnaire on production practices is sent out in April/May and the report is always published shortly before the ICAC Plenary Meeting. The primary source for the data is the ICAC Coordinating Agencies, but significant assistance is received from research institutes. Minor corrections are made as and when required. The extent of information collected in this survey is such that even Coordinating Agencies have to collect information from a variety of different sources within their countries. The information is stored in a database, which is updated as new or additional data become available.

Using the data, ICAC has prepared the World Cotton Calendar, which is available at http://worldcottoncalendar.icac.org. The Calendar is available for free and provides instant country and regional information on many important aspects of cotton production, including varieties (with share of planted area), fertilizer use, insects, weeds and diseases, as well as between three and five important monthly cotton-related activities.

Structure of Cotton Research, Input Supply and Transfer of Technology

This publication has undergone drastic changes over years. In addition to Coordinating Agencies, many other sources are used to compile this report. For publication of the report, information is extracted from a database. The publication is available for free at: https://www.icac.org/cotton_info/research/res_proj_db/structure-cotton-research2015.

Economics and Marketing

Sources of Estimates on Cotton Supply and Use

The ICAC Secretariat collects historical data on cotton supply and use by country, and formulates estimates and projections for the current and future seasons. The main statistics collected include planted area, production, consumption, trade and stocks. Yields are generally determined by dividing lint production by harvested area.

The sources used by the Secretariat may change over time, and continuous efforts are made to improve and expand the pool of available information. Current sources for cotton production (including area), consumption, trade and stocks data are separately discussed below. The database of the ICAC, which is freely available online and updated weekly, can be accessed at: https://icac.generation10.net/.

General Facts

As a general rule, the Secretariat of the ICAC adopts official national data whenever available. In the absence of official data, the Secretariat relies on secondary sources of information, such as the private sector, news providers, USDA Attaché reports, and statistics published by the Food and Agriculture Organization of the United Nations (FAO). When the lag between the event (production, consumption, etc.) and official reporting of estimates is too long, the Secretariat temporarily resorts to secondary sources until official data become available. The ICAC Secretariat also collects additional qualitative information to supplement the numerical data and improve its understanding of the cotton market in specific regions.

Adjustments to Collected Data

Adjustments and/or conversions of the raw data collected by the Secretariat are often necessary before incorporation into the ICAC database, in order to ensure comparability. Important issues include:

- Data from countries are often received in local units, which are converted into metric units, such as hectares, metric tons, and kilograms per hectare.
- Production in countries that do not have custom ginning is often reported in terms of seedcotton, not lint. In these situations, the Secretariat estimates lint production based on the ginning outturn ratio of the varieties grown in that country.
- Supply and use data (including stock data, when available) are often provided for the local cotton-marketing season, which varies among countries. For example, the cotton season runs from September to August in China, from October to September in India, and from April to March in Australia. These data are adjusted to reflect the international cotton season, which runs from August to July.
- Stock data, when available, often need to be adjusted in order to account for all types of storage, including cotton with producers, ginners, spinners, cotton in warehouses or in the transportation system, and cotton in ports.

Production Data

Major sources for estimates of cotton production by country were described by Gruère (2011). The Secretariat collects data by region where available.

- **Sources:** The main sources of production data include government agencies and cotton organizations/companies. Another important source of information, when no official data are available, is the private sector. Sources within the private sector include companies servicing the cotton industry (such as trading companies, ginners, spinners, and controllers), as well as news providers (such as Cotton Outlook and other specialized publications). In some cases, the ICAC Secretariat uses estimates of production published by the FAO.
- **Frequency:** For several countries, updated estimates of area and production are available every month during the season. This is the case for Brazil, China, South Africa and the United States. For other countries, estimates of area and production are updated several times during the season. This is the case for Argentina, Australia, Benin, Egypt, India and Pakistan. For many other countries, estimates or projections are made available on request. Finally, for a number of countries, estimates and projections are available at irregular intervals, when a new source of information becomes available. It is important to bear in mind that, for many countries, final estimates of production for a given season are not available until a few months to a full year after the end of that season.
- **Access:** The ICAC Secretariat accesses area and production estimates through two major channels: 1) reports on the Internet; and 2) e-mail exchanges and personal contacts. Governments and state-controlled cotton companies, especially in Africa, form the majority of the sources of production data. Private companies are a source of data for the production numbers collected by ICAC in the case of a small number of producing countries for which no data are available.

Consumption Data

For purposes of ICAC statistics, consumption means cotton consumed at a spinning mill or indigenously. Cotton use is more difficult to estimate than area and production. The unorganized sector, particularly in India and Pakistan, consumes a significant amount of raw cotton for domestic use, as well as for trade as yarn or raw fabric. In large consuming countries, cotton use is distributed among many spinning mills, ranging from very small to very large units, which complicates data collection. Some cotton is consumed outside of spinning mills, for example on farms. In addition, since cotton is an input to the industrial spinning process, its consumption is less frequently measured than the output: 100% cotton yarn or blended yarn (cotton mixed with other fibers, either synthetic or natural). Data on cotton use or cotton yarn production are usually collected by government agencies that are different from those that track cotton production. Because of these particularities, it is often necessary to collect more than one type of data (for example, yarn production, fabric production, cotton trade data, and qualitative reports) in order to estimate cotton consumption in a given country.

For each cotton-consuming country, the Secretariat attempts to collect as much information as possible. The ICAC Secretariat obtains cotton consumption estimates through two main channels:

- In a few countries (for example, the United States, South Africa, India and Pakistan), government agencies estimate annual and/or monthly cotton consumption. The Secretariat adopts these estimates, but verifies their consistency in relation to the country's balance sheet.
- In many countries, no estimates of cotton consumption are made. In these cases, the Secretariat collects data on cotton trade and/or cotton yarn production to develop estimates of cotton consumption. These data are usually available monthly.

  - When a country does not produce cotton, the Secretariat assumes that net cotton imports by the country in question are roughly equal to consumption (despite a lag of sometimes several months between imports and consumption). Data on cotton yarn production and anecdotal reports from the private sector can help strengthen the reliability of these estimates.

  - When a country does produce cotton, the Secretariat estimates consumption by deduction from other elements in the balance sheet (production, imports, exports, stocks), if these are known.

In these two situations, the Secretariat has to make assumptions regarding beginning and ending stocks in the country. The stock-to-use ratio is often assumed to remain stable from one season to the next.

Trade Data

Cotton trade data are tracked by customs services throughout the world. The Secretariat of the ICAC employs several means to collect these data:

- For a number of countries, the ICAC uses data from the Global Trade Atlas, which is a commercial database of trade data collected and collated by HIS Global Inc.
- A few ICAC members send monthly export and import estimates directly to the ICAC, thereby minimizing the possibility of errors by the Secretariat.
- For other countries, the ICAC collects trade data directly from customs services or the national statistics office, when such data are available. Many countries now publish this information on the Internet.
- For some other countries, the ICAC cannot access trade data and is forced to rely on secondary sources.

Stock Data

The ICAC Secretariat estimates beginning stocks and ending stocks for each season and each country in its database of cotton supply and use (as of July 31/August 1). Stocks are a vital part of a country's cotton balance sheet, since their estimation helps to assess how much cotton is available for use (as mill use or exports). Once aggregated among countries, the estimate of world stocks is useful to calculate the global stock-to-use ratio, which itself is an essential tool to evaluate the availability of stocks relative to demand in the world. Changes in the global stock-to-use ratio, when estimated correctly, can help us to understand better the movements of international cotton prices. Stock estimates at the country level can help to improve forecasts of cotton consumption and trade by country.

Unfortunately, cotton stock estimates often do not receive the attention they deserve. Very few countries produce estimates of their cotton stocks at a given time in the year and publish this information or make it available to the ICAC. This means that the Secretariat of the ICAC has little information on which to base its stock estimates. As a result, most estimates of ending stocks are currently calculated as a residual in the balance sheet, according to the following formula:

Ending stocks = Beginning stocks + Production + Imports – Consumption – Exports

This method is unsatisfactory, since it means that a mistake in estimating beginning stocks on any given date is passed on for many years until new information becomes available. It also means that any error in estimating the other elements of the balance sheet (such as production and consumption) will be reflected in the estimate of ending stocks. Apart from the official estimates of stocks that are published by a few governments, the Secretariat has to rely on unofficial reports from the private sector in order to estimate stocks.

2014/15 SUPPLY AND USE OF COTTON BY COUNTRY December 1, 2016

	AREA	YIELD	PROD	BEG STKS	IMPORTS	CONS	EXPORTS	END STKS	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
CANADA				0	1	1		0	0.14	0.14
CUBA	4	272	1	1	2	3		1	0.19	0.19
DOM. REP.					1	1		0	0.47	0.47
MEXICO	182	1,577	287	138	211	410	36	190	0.42	0.46
USA	3,783	939	3,553	651	3	778	2,449	980	0.30	1.26
N. America	**3,974**	**967**	**3,842**	**791**	**217**	**1,194**	**2,485**	**1,171**	**0.32**	**0.98**
EL SALVADOR				8	32	30		10	0.32	0.32
GUATEMALA				7	24	24		8	0.33	0.33
HONDURAS	0	319	0	0	0	0		0	0.11	
C. America	**2**	**514**	**1**	**16**	**58**	**55**	**0**	**18**	**0.32**	**0.32**
ARGENTINA	456	537	245	285	2	142	84	306	1.36	2.16
BOLIVIA	4	625	3	3	1	4		2	0.59	0.59
BRAZIL	976	1,601	1,563	1,239	5	797	851	1,158	0.70	1.45
CHILE				0	0	0		0	0.37	0.37
COLOMBIA	32	836	27	15	24	54	2	10	0.19	0.20
ECUADOR	1	440	1	2	12	13		1	0.10	0.10
PARAGUAY	13	444	6	1	1	3	3	2	0.41	0.75
PERU	36	792	29	17	54	82	1	15	0.18	0.19
URUGUAY				0	0	0		0	1.19	1.19
VENEZUELA	15	387	6	1	8	11		5	0.46	0.46
S. America	**1,534**	**1,224**	**1,878**	**1,563**	**109**	**1,106**	**942**	**1,502**	**0.73**	**1.36**
ALGERIA				1	6	6		1	0.12	0.12
EGYPT	158	709	112	58	74	132	39	73	0.42	0.55
MOROCCO				4	37	36		5	0.14	0.14
SUDAN	89	516	46	17		19	16	28	0.82	1.51
TUNISIA				3	13	13		3	0.21	0.21
N. Africa	**247**	**639**	**158**	**83**	**130**	**206**	**55**	**110**	**0.42**	**0.53**
BENIN	379	443	168	15		4	112	67	0.57	16.66
BURKINA FASO	661	450	298	76		4	213	157	0.72	39.15
CAMEROON	227	535	121	39		2	89	69	0.76	36.34
CENT. AFR. REP.	36	230	8	3			8	3	0.40	
CHAD	256	225	58	12		1	47	23	0.48	45.00
COTE D'IVOIRE	415	466	193	35		2	188	39	0.21	19.14
GUINEA	12	272	3	1			4	1	0.36	
MADAGASCAR				3				3		
MALI	570	408	233	68		3	186	112	0.59	37.27
NIGER	5	448	2	0		1	1	0	0.11	0.25
SENEGAL	25	360	9	4		1	10	2	0.22	3.04
TOGO	122	373	45	7			39	13	0.34	
F. Africa	**2,707**	**421**	**1,139**	**265**		**17**	**897**	**489**	**0.54**	**28.49**
ANGOLA	3	302	1	0		1	0	0	0.25	0.41
ETHIOPIA	99	478	47	3	11	48	0	13	0.27	0.28
GHANA	15	366	5	2		1	4	2	0.33	1.31
KENYA	38	184	7	1	0	7		2	0.24	0.24
MALAWI	146	271	39	26		3	39	24	0.56	7.90
MOZAMBIQUE	120	222	27	20			28	19	0.68	
NIGERIA	298	205	61	26	1	21	38	29	0.49	1.40
SOUTH AFRICA	15	1,205	18	8	19	21	7	18	0.63	0.84
TANZANIA	350	243	85	93		39	44	95	1.14	2.45
UGANDA	61	284	17	21		2	15	21	1.23	11.68
CONGO, DR				2	8	8		2	0.27	0.27
ZAMBIA	127	371	47	43		2	46	42	0.90	
ZIMBABWE	230	187	43	34		4	49	25	0.47	6.53
S. Africa	**1,524**	**264**	**403**	**286**	**60**	**179**	**272**	**297**	**0.66**	**1.66**
KAZAKHSTAN	128	671	55	17	0	14	41	17	0.31	1.26
KYRGYZSTAN	23	821	19	6	3	1	21	6	0.28	6.46
TAJIKISTAN	175	539	94	33		9	87	30	0.31	3.18
TURKMENISTAN	545	478	330	259		137	338	114	0.24	0.84
UZBEKISTAN	1,298	682	885	273	1	345	550	264	0.30	0.77
C. Asia	**2,169**	**638**	**1,383**	**588**	**4**	**505**	**1,038**	**432**	**1.44**	**0.86**

2014/15 SUPPLY & USE OF COTTON BY COUNTRY (cont'd) December 1, 2016

	AREA	YIELD	PROD	BEG STKS	IMPORTS	CONS	EXPORTS	END STKS	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
AUSTRIA				1	4	4	1	0	0.10	0.11
AZERBAIJAN	23	699	16	16		16	3	14	0.74	0.88
BELARUS				4	11	11		4	0.34	0.34
BELGIUM				2	13	8	5	2	0.13	0.22
BULGARIA	0	324	0	1	5	5		1	0.12	0.12
CZECH REP.				0	3	3		0	0.12	0.12
DENMARK					0	0				
ESTONIA										
FINLAND										
FRANCE				3	16	13	3	3	0.16	0.19
GERMANY				16	45	45	6	10	0.20	0.22
GREECE	271	1,007	273	45	4	20	254	48	0.18	2.42
HUNGARY				0	1	0	1	0	0.21	0.99
IRELAND				0	0	0	0	0	0.07	0.08
ITALY				6	49	45	3	7	0.14	0.15
LATVIA				0	0	0		0	0.98	0.98
LITHUANIA				0	0		0	0		
MOLDOVA				1	2	2		1	0.34	0.34
NETHERLANDS				0	5	5		0	0.10	
NORWAY										
POLAND				0	4	4		0	0.12	0.12
PORTUGAL				7	35	34	0	7	0.20	0.20
ROMANIA				0	0	0		0	0.07	0.07
RUSSIA	1	521	1	17	75	68	1	24	0.35	0.36
SLOVAK REP.										
SPAIN	74	1,009	75	19	4	5	79	14	0.16	2.59
SWEDEN				0	0	0		0		
SWITZERLAND				0	3	3	0	0	0.10	0.10
UKRAINE				0	2	2		0	0.23	0.23
UNITED KINGDOM				0	0	0	0	0	0.10	0.13
FORMER YUGOSLAVIA				1	7	7	0	1	0.18	0.18
Europe	**371**	**983**	**365**	**141**	**293**	**304**	**356**	**139**	**0.21**	**0.46**
Including EU-28	**346**	**1,006**	**348**	**102**	**190**	**194**	**352**	**94**	**0.17**	**0.48**
CHINA	4,310	1,508	6,500	12,109	1,804	7,479	15	12,917	1.72	1.73
TAIWAN				42	190	183		49	0.27	0.27
HONG KONG				35	1		3	33	12.65	
Sub total	**4,310**	**1,508**	**6,500**	**12,185**	**1,995**	**7,662**	**18**	**12,999**	**1.69**	**1.70**
AUSTRALIA	197	2,680	528	181	0	7	520	182	0.34	25.26
INDONESIA	9	603	5	86	728	711	1	107	0.15	0.15
JAPAN				16	65	65		16	0.24	0.24
KOREA, D.R.				1	5	5		1	0.24	0.24
KOREA, REP.				72	288	290	2	68	0.24	0.24
MALAYSIA				17	79	54	18	25	0.35	0.47
PHILIPPINES	0	569	0	2	13	12		3	0.25	0.25
SINGAPORE				0	0			0		
THAILAND	2	518	1	53	320	330		44	0.13	0.13
VIETNAM	3	465	1	94	934	875		154	0.18	0.18
E. Asia	**231**	**2,355**	**543**	**526**	**2,432**	**2,356**	**541**	**603**	**0.21**	**0.26**
AFGHANISTAN	45	414	19	16		4	16	14	0.66	3.15
BANGLADESH	40	675	27	314	1,177	1,204		314	0.26	0.26
INDIA	12,846	511	6,562	1,864	267	5,261	914	2,518	0.41	0.48
MYANMAR	299	650	195	99	11	201		104	0.52	0.52
PAKISTAN	2,958	779	2,305	870	166	2,492	96	753	0.29	0.30
SRI LANKA				0	2	2		0	0.11	0.11
S. Asia	**16,191**	**563**	**9,109**	**3,165**	**1,622**	**9,167**	**1,026**	**3,704**	**0.36**	**0.40**
IRAN	85	694	59	33	51	113		29	0.26	0.26
IRAQ	19	362	7	1	6	13		1	0.09	0.09
ISRAEL	7	2,020	14	1			14	1	0.10	
SYRIA	72	976	70	121		85	38	68	0.56	0.80
TURKEY	460	1,573	724	835	800	1,486	126	748	0.46	0.50
Sub total	**660**	**1,334**	**880**	**996**	**867**	**1,713**	**178**	**852**	**0.45**	**0.50**
WORLD TOTAL	**33,919**	**772**	**26,201**	**20,604**	**7,785**	**24,465**	**7,808**	**22,315**	**0.91**	**0.91**

*/ Ending stocks divided by consumption plus exports.

**/ Ending stocks divided by consumption.

Subtotals and total include countries not shown.

2015/16 SUPPLY AND USE OF COTTON BY COUNTRY December 1, 2016

	AREA	YIELD	PROD	BEG STKS	IMPORTS	CONS	EXPORTS	END STKS	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
CANADA				0	0	0	0	0	0.11	0.12
CUBA	4	272	1	1	2	3		1	0.19	0.19
DOM. REP.					1	1		0	0.47	0.47
MEXICO	130	1,523	198	190	222	418	31	161	0.36	0.38
USA	3,268	859	2,806	980	7	751	1,993	1,049	0.38	1.40
N. America	**3,407**	**882**	**3,006**	**1,171**	**233**	**1,175**	**2,024**	**1,211**	**0.38**	**1.03**
EL SALVADOR				10	35	35		10	0.28	0.28
GUATEMALA				8	23	24		7	0.29	0.29
HONDURAS	0	319	0	0		0		0		
C. America	**2**	**513**	**1**	**18**	**64**	**60**	**0**	**17**	**0.28**	**0.28**
ARGENTINA	376	519	195	306	4	144	48	312	1.62	2.16
BOLIVIA	4	625	3	2	1	3		2	0.70	0.70
BRAZIL	955	1,350	1,289	1,158	20	733	939	795	0.48	1.08
CHILE				0	0	0		0	0.12	0.12
COLOMBIA	26	827	22	10	39	56	1	14	0.25	0.25
ECUADOR	1	440	1	1	13	13		1	0.10	0.10
PARAGUAY	13	444	6	2	1	2	4	3	0.44	1.38
PERU	27	752	20	15	43	62	1	16	0.26	0.26
URUGUAY				0		0		0	0.58	0.58
VENEZUELA	15	406	6	5	6	11		6	0.55	0.55
S. America	**1,416**	**1,088**	**1,541**	**1,502**	**126**	**1,025**	**994**	**1,150**	**0.57**	**1.12**
ALGERIA				1	6	6		1	0.13	0.13
EGYPT	105	525	55	73	70	130	35	33	0.20	0.25
MOROCCO				5	36	36		5	0.14	0.14
SUDAN	50	516	28	28		19	18	20	0.55	1.06
TUNISIA				3	13	13		3	0.21	0.21
N. Africa	**155**	**536**	**83**	**110**	**125**	**203**	**53**	**61**	**0.24**	**0.30**
BENIN	307	338	104	67		4	108	58	0.52	14.62
BURKINA FASO	663	368	244	157		4	262	134	0.50	33.55
CAMEROON	222	513	114	69		2	113	69	0.60	36.05
CENT. AFR. REP.	35	230	8	3			8	3	0.40	
CHAD	289	203	59	23		1	58	23	0.39	46.01
COTE D'IVOIRE	402	441	177	39		2	161	53	0.33	25.95
GUINEA	12	273	3	1			3	1	0.41	
MADAGASCAR				3				3		
MALI	573	377	216	112		3	218	107	0.48	35.51
NIGER	5	448	2	0		1	1	0	0.11	0.25
SENEGAL	31	384	12	2		1	11	3	0.24	3.61
TOGO	117	256	30	13			31	12	0.38	
F. Africa	**2,656**	**365**	**969**	**489**		**17**	**975**	**467**	**0.47**	**27.16**
ANGOLA	3	302	1	0		1	0	0	0.35	0.48
ETHIOPIA	66	642	42	13	13	50	0	19	0.37	0.37
GHANA	12	366	4	2		1	3	1	0.30	1.11
KENYA	21	184	4	2		4		1	0.24	0.24
MALAWI	141	230	33	24		3	31	22	0.65	7.37
MOZAMBIQUE	110	181	20	19			23	16	0.70	
NIGERIA	253	205	52	29	1	23	37	22	0.36	0.96
SOUTH AFRICA	7	1,250	9	18	16	21	14	8	0.23	0.39
TANZANIA	315	217	68	95		39	38	87	1.13	2.23
UGANDA	65	314	20	21		0	20	21	1.05	49.10
CONGO, DR				2	8	8		2	0.27	0.27
ZAMBIA	122	325	40	42		2	41	39	0.91	
ZIMBABWE	101	114	12	25		3	30	3	0.10	1.21
S. Africa	**1,237**	**249**	**308**	**297**	**59**	**178**	**239**	**248**	**0.59**	**1.39**
KAZAKHSTAN	99	436	43	17	0	14	31	16	0.35	1.11
KYRGYZSTAN	14	810	12	6	4	1	16	4	0.23	4.19
TAJIKISTAN	154	533	82	30		9	75	27	0.32	2.88
TURKMENISTAN	545	544	290	114		143	147	114	0.39	0.80
UZBEKISTAN	1,298	641	832	264	1	338	544	216	0.24	0.64
C. Asia	**2,111**	**597**	**1,259**	**432**	**5**	**505**	**814**	**377**	**1.54**	**0.75**

2015/16 SUPPLY & USE OF COTTON BY COUNTRY (cont'd) December 1, 2016

	AREA	YIELD	PROD	BEG STKS	IMPORTS	CONS	EXPORTS	END STKS	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
AUSTRIA				0	4	3	1	0	0.12	0.15
AZERBAIJAN	19	733	14	14		16	2	10	0.58	0.65
BELARUS				4	11	11		4	0.34	0.34
BELGIUM				2	11	7	4	2	0.16	0.25
BULGARIA	0	324	0	1	5	5	0	1	0.14	0.15
CZECH REP.				0	3	3		0	0.13	0.13
DENMARK					0	0				
ESTONIA										
FINLAND										
FRANCE				3	12	10	3	2	0.14	0.18
GERMANY				10	44	38	7	9	0.20	0.24
GREECE	240	908	218	48	6	20	209	44	0.19	2.18
HUNGARY				0	1		1	0	0.17	
IRELAND				0	0	0	0	0	0.13	0.16
ITALY				7	40	37	2	7	0.17	0.18
LATVIA				0	1	1	0	0	0.09	0.10
LITHUANIA				0				0		
MOLDOVA				1	2	2		1	0.34	0.34
NETHERLANDS				0	4	4		0	0.10	
NORWAY										
POLAND				0	3	3	0	0	0.12	0.12
PORTUGAL				7	38	37	0	7	0.19	0.19
ROMANIA				0	0	0	0	0	0.08	0.09
RUSSIA	1	521	1	24	52	64	0	13	0.20	0.20
SLOVAK REP.										
SPAIN	66	847	56	14	3	5	57	10	0.16	1.97
SWEDEN				0	0	0		0		
SWITZERLAND				0	3	3	0	0	0.10	0.10
UKRAINE				0	2	2		0	0.23	0.23
UNITED KINGDOM				0	0	0	0	0	0.12	0.15
FORMER YUGOSLAVIA				1	7	7		1	0.19	0.19
Europe	**328**	**881**	**289**	**139**	**255**	**282**	**287**	**113**	**0.20**	**0.40**
Including EU-28	**306**	**894**	**274**	**94**	**176**	**176**	**284**	**83**	**0.18**	**0.47**
CHINA	3,060	1,553	4,753	12,917	959	7,442	28	11,160	1.49	1.50
TAIWAN				49	154	161		41	0.26	0.26
HONG KONG				33	0		1	33	62.96	
Sub total	**3,060**	**1,553**	**4,753**	**12,999**	**1,114**	**7,603**	**28**	**11,234**	**1.47**	**1.48**
AUSTRALIA	270	2,144	579	182	0	7	616	138	0.22	19.55
INDONESIA	8	603	5	107	640	647	3	102	0.16	0.16
JAPAN				16	67	71		12	0.17	0.17
KOREA, D.R.				1	5	5		1	0.24	0.24
KOREA, REP.				68	256	275	1	48	0.17	0.18
MALAYSIA				25	101	79	12	35	0.39	0.44
PHILIPPINES	0	569	0	3	10	10		3	0.30	0.30
SINGAPORE				0	9		9	0	0.04	
THAILAND	2	518	1	44	278	278	0	46	0.16	0.16
VIETNAM	5	465	2	154	1,001	1,007		151	0.15	0.15
E. Asia	**305**	**1,952**	**595**	**603**	**2,367**	**2,386**	**640**	**539**	**0.18**	**0.23**
AFGHANISTAN	45	414	19	14		4	14	14	0.74	3.15
BANGLADESH	40	675	27	314	1,355	1,324		372	0.28	0.28
INDIA	11,910	482	5,746	2,518	234	5,243	1,255	2,000	0.31	0.38
MYANMAR	239	653	156	104	51	207		104	0.50	0.50
PAKISTAN	2,869	528	1,514	753	490	2,268	56	433	0.19	0.19
SRI LANKA				0	2	2		0	0.11	0.11
S. Asia	**15,106**	**494**	**7,464**	**3,704**	**2,130**	**9,051**	**1,324**	**2,923**	**0.28**	**0.32**
IRAN	72	687	49	29	51	100		30	0.30	0.30
IRAQ	17	362	6	1	5	10		2	0.21	0.21
ISRAEL	9	1,891	17	1			17	2	0.11	
SYRIA	44	879	39	68		60	25	22	0.27	0.38
TURKEY	434	1,475	640	748	918	1,500	106	700	0.44	0.47
Sub total	**592**	**1,281**	**757**	**852**	**984**	**1,685**	**149**	**760**	**0.41**	0.45
WORLD TOTAL	**30,374**	**692**	**21,026**	**22,315**	**7,461**	**24,171**	**7,526**	**19,099**	**0.79**	**0.79**

*/ Ending stocks divided by consumption plus exports.

**/ Ending stocks divided by consumption.

Subtotals and total include countries not shown.

2016/17 SUPPLY AND USE OF COTTON BY COUNTRY December 1, 2016

	AREA	YIELD	PROD	BEG STKS	IMPORTS	CONS	EXPORTS	END STKS	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
CANADA				0	0	0		0	0.11	0.11
CUBA	4	271	1	1	2	3		1	0.19	0.19
DOM. REP.					1	1		0	0.47	0.47
MEXICO	95	1,559	148	161	298	418	28	161	0.36	0.38
USA	3,907	901	3,519	1,049	2	762	2,580	1,228	0.37	1.61
N. America	**4,011**	**915**	**3,669**	**1,211**	**304**	**1,186**	**2,608**	**1,391**	**0.37**	**1.17**
EL SALVADOR				10	35	35		10	0.28	0.28
GUATEMALA				7	24	24		7	0.29	0.29
HONDURAS	0	318	0	0		0		0		
C. America	**2**	**512**	**1**	**17**	**59**	**60**	**0**	**17**	**0.28**	**0.28**
ARGENTINA	387	522	202	312	3	141	95	281	1.19	1.99
BOLIVIA	4	639	3	2	0	3	0	2	0.50	0.53
BRAZIL	920	1,537	1,414	795	19	645	755	827	0.59	1.28
CHILE				0	0	0		0	0.12	0.12
COLOMBIA	26	816	21	14	35	56		14	0.25	0.25
ECUADOR	1	439	1	1	13	13		1	0.10	0.10
PARAGUAY	12	413	5	3	1	2	4	2	0.33	0.96
PERU	27	814	22	16	39	61	1	16	0.26	0.27
URUGUAY				0		0		0	0.06	0.06
VENEZUELA	15	390	6	6	4	10		5	0.47	0.47
S. America	**1,392**	**1,202**	**1,673**	**1,150**	**114**	**933**	**856**	**1,149**	**0.64**	**1.23**
ALGERIA				1	6	6		1	0.13	0.13
EGYPT	60	737	44	33	92	117	24	29	0.20	0.24
MOROCCO				5	36	36		5	0.14	0.14
SUDAN	49	487	24	20		18	13	13	0.41	0.72
TUNISIA				3	12	12		3	0.22	0.22
N. Africa	**109**	**625**	**68**	**61**	**146**	**188**	**38**	**50**	**0.22**	**0.26**
BENIN	392	385	151	58		4	137	68	0.48	16.96
BURKINA FASO	762	412	314	134		4	295	149	0.50	37.33
CAMEROON	224	462	103	69		2	116	54	0.46	28.32
CENT. AFR. REP.	35	231	8	3			8	3	0.40	
CHAD	298	255	76	23		1	61	38	0.61	75.00
COTE D'IVOIRE	343	459	157	53		2	149	60	0.40	29.01
GUINEA	12	276	3	1			3	1	0.40	
MADAGASCAR				3				3		
MALI	693	390	270	107		3	255	119	0.46	39.61
NIGER	5	447	2	0		1	1	0	0.11	0.25
SENEGAL	22	385	8	3		1	8	3	0.36	3.80
TOGO	131	316	42	12			39	15	0.37	
F. Africa	**2,916**	**389**	**1,135**	**467**		**17**	**1,072**	**513**	**0.47**	**29.81**
ANGOLA	3	302	1	0		1	0	0	0.33	0.48
ETHIOPIA	69	560	39	19	13	51	0	19	0.36	0.36
GHANA	12	365	4	1		1	3	1	0.33	1.11
KENYA	21	181	4	1	0	4		1	0.17	0.17
MALAWI	134	240	32	22		3	29	23	0.72	7.61
MOZAMBIQUE	110	208	23	16			25	14	0.54	
NIGERIA	253	202	51	22	1	25	31	18	0.32	0.71
SOUTH AFRICA	7	1,209	9	8	16	20	5	8	0.32	0.40
TANZANIA	315	217	68	87		39	53	64	0.69	1.63
UGANDA	66	284	19	21		0	30	10	0.34	23.10
CONGO, DR				2	8	8		2	0.27	0.27
ZAMBIA	122	325	40	39		2	40	37	0.91	
ZIMBABWE	99	180	18	3		3	12	6	0.43	2.26
S. Africa	**1,233**	**253**	**311**	**248**	**59**	**181**	**228**	**209**	**0.51**	**1.15**
KAZAKHSTAN	109	529	58	16	0	14	44	16	0.27	1.13
KYRGYZSTAN	14	810	12	4	4	1	14	4	0.27	4.19
TAJIKISTAN	154	566	87	27		9	78	27	0.31	2.88
TURKMENISTAN	545	561	306	114		148	158	114	0.37	0.77
UZBEKISTAN	1,256	652	818	216	1	341	456	237	0.30	0.70
C. Asia	**2,078**	**616**	**1,280**	**377**	**5**	**513**	**750**	**399**	**1.52**	**0.78**

2016/17 SUPPLY & USE OF COTTON BY COUNTRY (cont'd) December 1, 2016

	AREA	YIELD	PROD	BEG STKS	IMPORTS	CONS	EXPORTS	END STKS	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
AUSTRIA				0	4	3	1	0	0.12	0.15
AZERBAIJAN	33	763	25	10		16	6	14	0.65	0.89
BELARUS				4	11	11		4	0.34	0.34
BELGIUM				2	10	7	4	2	0.17	0.27
BULGARIA	0	324	0	1	5	5	0	1	0.13	0.13
CZECH REP.				0	3	3		0	0.13	0.13
DENMARK					0	0				
ESTONIA										
FINLAND										
FRANCE				2	13	10	3	2	0.14	0.19
GERMANY				9	44	38	6	9	0.21	0.24
GREECE	211	1,009	213	44	5	20	198	44	0.20	2.18
HUNGARY				0	1		1	0	0.03	
IRELAND				0	0	0		0	0.09	0.09
ITALY				7	39	36	3	7	0.17	0.18
LATVIA				0	0	0	0	0	0.03	0.04
LITHUANIA				0				0		
MOLDOVA				1	2	2		1	0.34	0.34
NETHERLANDS				0	4	4		0	0.10	
NORWAY										
POLAND				0	3	3		0	0.12	0.12
PORTUGAL				7	38	37	0	7	0.19	0.19
ROMANIA				0	0	0		0	0.09	0.09
RUSSIA	1	520	1	13	62	62	0	13	0.21	0.21
SLOVAK REP.										
SPAIN	66	873	58	10	3	5	53	12	0.21	2.52
SWEDEN				0	0	0		0		
SWITZERLAND				0	3	3	0	0	0.10	0.10
UKRAINE				0	2	2		0	0.25	0.25
UNITED KINGDOM				0	0	0		0	0.14	0.14
FORMER YUGOSLAVIA				1	7	7		1	0.19	0.19
Europe	**313**	**948**	**297**	**113**	**262**	**278**	**275**	**119**	**0.22**	**0.43**
Including EU-28	**277**	**976**	**271**	**83**	**174**	**173**	**269**	**85**	**0.19**	**0.49**
CHINA	2,846	1,600	4,553	11,160	985	7,442	36	9,220	1.23	1.24
TAIWAN				41	153	153		41	0.27	0.27
HONG KONG				33	0		1	33	41.48	
Sub total	**2,846**	**1,600**	**4,553**	**11,234**	**1,139**	**7,595**	**37**	**9,294**	**1.22**	**1.22**
AUSTRALIA	475	1,844	876	138	0	7	746	261	0.35	38.98
INDONESIA	8	615	5	102	646	647		106	0.16	0.16
JAPAN				12	70	70		12	0.17	0.17
KOREA, D.R.				1	5	5		1	0.24	0.24
KOREA, REP.				48	267	267	1	47	0.18	0.18
MALAYSIA				35	91	82	12	33	0.35	0.40
PHILIPPINES	0	567	0	3	10	10		3	0.28	0.28
SINGAPORE				0	7		7	0	0.05	
THAILAND	2	517	1	46	274	275		46	0.17	0.17
VIETNAM	5	465	2	151	1,152	1,137		167	0.15	0.15
E. Asia	**509**	**1,752**	**891**	**539**	**2,521**	**2,507**	**765**	**678**	**0.21**	**0.27**
AFGHANISTAN	40	413	17	14		4	13	13	0.74	2.95
BANGLADESH	40	708	28	372	1,362	1,390		372	0.27	0.27
INDIA	10,957	526	5,766	2,000	222	5,248	825	1,915	0.32	0.36
MYANMAR	244	634	155	104	10	207		62	0.30	0.30
PAKISTAN	2,525	743	1,876	433	462	2,279	33	458	0.20	0.20
SRI LANKA				0	2	2		0	0.11	0.11
S. Asia	**13,809**	**568**	**7,844**	**2,923**	**2,058**	**9,133**	**871**	**2,820**	**0.28**	**0.31**
IRAN	70	824	58	30	52	110		30	0.27	0.27
IRAQ	13	361	5	2	4	9		2	0.21	0.21
ISRAEL	8	1,761	14	2			14	2	0.13	
SYRIA	35	983	35	22		24	21	12	0.27	0.50
TURKEY	415	1,555	645	700	911	1,450	109	697	0.45	0.48
Sub total	**544**	**1,392**	**757**	**760**	**977**	**1,605**	**144**	**745**	**0.43**	**0.46**
WORLD TOTAL	**29,762**	**755**	**22,480**	**19,099**	**7,644**	**24,196**	**7,644**	**17,383**	**0.72**	**0.72**

*/ Ending stocks divided by consumption plus exports.

**/ Ending stocks divided by consumption.

Subtotals and total include countries not shown.

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SUPPLY AND DISTRIBUTION OF COTTON

December 1, 2016

Seasons begin on August 1

	2011/12	2012/13	2013/14 Est.	2014/15 Est.	2015/16 Est.	2016/17 Proj.
	Million Metric Tons					
BEGINNING STOCKS						
WORLD TOTAL	**10.316**	**15.362**	**18.508**	**20.604**	**22.32**	**19.10**
CHINA	2.087	6.181	9.607	12.109	12.92	11.16
USA	0.566	0.729	0.903	0.651	0.98	1.05
PRODUCTION						
WORLD TOTAL	**27.848**	**26.785**	**26.175**	**26.201**	**21.03**	**22.48**
INDIA	6.239	6.290	6.766	6.562	5.75	5.77
CHINA	7.400	7.300	6.950	6.500	4.75	4.55
USA	3.391	3.770	2.811	3.553	2.81	3.52
PAKISTAN	2.311	2.002	2.076	2.305	1.51	1.88
BRAZIL	1.877	1.310	1.734	1.563	1.29	1.41
UZBEKISTAN	0.880	1.000	0.910	0.885	0.83	0.82
OTHERS	5.750	5.113	4.929	4.834	4.09	4.53
CONSUMPTION						
WORLD TOTAL	**22.819**	**23.780**	**24.004**	**24.465**	**24.17**	**24.20**
CHINA	8.635	8.290	7.517	7.479	7.44	7.44
INDIA	4.231	4.731	5.057	5.261	5.24	5.25
PAKISTAN	2.121	2.216	2.470	2.492	2.27	2.28
EUROPE & TURKEY	1.498	1.560	1.611	1.692	1.69	1.63
VIETNAM	0.410	0.492	0.673	0.875	1.01	1.14
BANGLADESH	0.731	1.023	1.146	1.204	1.32	1.39
USA	0.718	0.762	0.773	0.778	0.75	0.76
BRAZIL	0.897	0.910	0.862	0.797	0.73	0.65
OTHERS	3.578	3.795	3.894	3.887	3.72	3.66
EXPORTS						
WORLD TOTAL	**9.846**	**10.061**	**9.010**	**7.808**	**7.53**	**7.64**
USA	2.526	2.836	2.293	2.449	1.99	2.58
INDIA	2.159	1.685	2.014	0.914	1.25	0.82
CFA ZONE	0.597	0.828	0.973	0.893	0.97	1.07
BRAZIL	1.043	0.938	0.485	0.851	0.94	0.76
UZBEKISTAN	0.550	0.690	0.615	0.550	0.54	0.46
AUSTRALIA	1.010	1.343	1.057	0.520	0.62	0.75
IMPORTS						
WORLD TOTAL	**9.844**	**10.201**	**8.935**	**7.785**	**7.46**	**7.64**
CHINA	5.342	4.426	3.075	1.804	0.96	0.99
VIETNAM	0.379	0.517	0.687	0.934	1.00	1.15
BANGLADESH	0.738	1.044	1.190	1.177	1.35	1.36
INDONESIA	0.540	0.686	0.651	0.728	0.64	0.65
TURKEY	0.519	0.803	0.924	0.800	0.92	0.91
TRADE IMBALANCE 1/	**-0.001**	**0.140**	**-0.075**	**-0.023**	**-0.07**	**0.00**
STOCKS ADJUSTMENT 2/	**0.018**	**0.001**	**0.000**	**-0.002**	**-0.01**	**0.00**
ENDING STOCKS						
WORLD TOTAL	**15.362**	**18.508**	**20.604**	**22.315**	**19.10**	**17.38**
CHINA	6.181	9.607	12.109	12.917	11.16	9.22
USA	0.729	0.903	0.651	0.980	1.05	1.23
ENDING STOCKS/MILL USE (%)						
WORLD-LESS-CHINA 3/	**65**	**57**	**52**	**55**	**47**	**47**
CHINA 4/	**72**	**116**	**161**	**173**	**150**	**124**
COTLOOK A INDEX 5/	**100**	**88**	**91**	**71**	**70**	

1/ The inclusion of linters and waste, changes in weight during transit, differences in reporting periods and measurement error account for differences between world imports and exports.
2/ Difference between calculated stocks and actual; amounts for forward seasons are anticipated.
3/ World-less-China's ending stocks divided by World-less-China's mill use, multiplied by 100.
4/ China's ending stocks divided by China's mill use, multiplied by 100.
5/ U.S. cents per pound.