



## THE WORLD COTTON SITUATION

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### Price Situation

Between November 1998 and February 1999 international cotton prices, as measured by the Cotlook A Index, fluctuated between 55 and 56 cents per pound. In March and April 1999, the Cotlook A Index averaged 57 cents. In May, prices continued climbing slowly and by mid-month were fluctuating around 60 cents per pound. Nine months into 1998/99, the average Cotlook A Index to date is 59.5 cents per pound.

According to market fundamentals, prices should be higher than current levels. World ending stocks have declined from 9.9 million tons in 1997/98 to 9.4 million tons this season. With world cotton consumption at 18.9 million tons, the stocks-to-use ratio outside China (Mainland) has fallen to 37%. In addition, China (Mainland) has not become a large net exporter of cotton as feared by the market during the first half of the season. In 1998/99 China (Mainland) is expected to export 40,000 tons, the second lowest level of net exports during the two-decade period.

What is keeping cotton prices lower than suggested by market fundamentals? The ICAC Secretariat has suggested that the slow-down of the world economy caused by the financial crises in Asia, Russia and Brazil created fears in the market of an imminent sharp decline in cotton consumption. Such fears have been a force behind price declines in most other major commodities. According to the International Monetary Fund, prices of soybeans, wheat and corn declined in a range of 20% to 30% between July 1997 and March 1999. Another reason why prices could be lower is the fact that the market incorrectly expected China (Mainland) to export about half a million tons. Chinese exports are only 120,000 tons this season.

It is likely that prices will continue to recover during the remainder of 1998/99, but not far from its current level. According to the International Monetary Fund, the world economy is expected to regain strength during the second semester of 1999. Cotton consumption is, therefore, expected to increase by 300,000 tons to 19.2 million tons in 1999/00. Nonetheless, mill consumption is not expected to increase in the USA, the European Union and East Asian countries, key markets determining the course of international prices. Most of the increase in mill consumption is expected to take place in India, Russia and Mexico.

So what are prices going to be? Ongoing research at the ICAC Secretariat suggests that average prices might not increase very rapidly in 1999/00. The ICAC Price Model, corrected for average error, suggests that the Cotlook A Index will average 64 cents per pound in 1999/00.

### Production

In 1999/00, world cotton production is expected to increase to 19.1 million tons while consumption is expected to increase to 19.2 million tons. World production is expected to rise to 19.5 million tons in 2000/01, a forecast more than one million tons below the record set in 1991/92.

The six largest cotton producers account for about three-fourths of world production. Production is expected to fall in China (Mainland) but to rise in most other countries in 1999/00 and 2000/01. China is now stressing the goal of reducing stocks by lowering prices, and lower farm prices may lead to lower cotton production, as the incentive to hand-harvest all the cotton grown will be reduced. Cotton production for 1999/00 in China is estimated at 4.1 million tons, and production for 2000/01 is expected to drop even lower to 4 million tons.

Increased U.S. production will boost the world total in 1999/00. Texas, traditionally the region of greatest concern within the USA, has enjoyed good rainfall. Five-year average yields by state applied to estimates of

harvested area result in a production forecast for the USA of 3.7 million tons for 1999/00 and 3.6 million tons for 2000/01.

India produced three million tons in 1996/97. But, a second consecutive year of disappointing yields in the north of India has reduced production in 1998/99. Main reasons are leaf curl virus disease and resistance to pesticides in the northern part of the country. With increased cotton area in the central and southern regions linked to government and industry incentives, production in 1999/00 and 2000/01 in India could rise modestly and is estimated at 2.80 million and 2.85 million tons, respectively.

Production in Pakistan is estimated at 1.5 million tons in the next two years, essentially the same as this season. Farmers in Pakistan have adopted new varieties and agronomic practices during the 1990s to largely overcome the effects of the leaf curl virus. However, heavy applications of pesticides in an effort to control the whitefly, a vector for the leaf curl virus, has changed the pest complex in Pakistan and a second problem of bollworm resistance to pesticides has developed.

Uzbekistan has met the government planting target of 1.5 million hectares in 1999, and better weather could lead to increased production. 214,000 hectares are reported to be planted under plastic in the current which may also have a positive effect on yields. The 1998/99 national yield of 650 kilograms per hectare was the lowest in over two decades, suggesting that difficulties supplying inputs to growers and providing adequate incentives for production have not been overcome.

Cotton production in Turkey is expected to rise gradually over the next decade as an irrigation project in the eastern part of the country is completed. Two other regions of notable growth in production this decade have been Francophone Africa and Australia.

## **Consumption**

The world textile consumption at the end-use level increased 5.6% in 1997, the fastest increase since 1986. As world economic conditions deteriorated in 1998, the prospects for continued strong growth of textile consumption greatly diminished. Current estimates suggest that world textile consumption expanded 0.9% in 1998 and will expand 0.2% in 1999. Demand for cotton continues perform below demand for other fibers and as a result it is estimated that the market share of cotton in 1998 was 42.6%.

World cotton consumption is expected to increase by two to five percent in the next two years. Essentially, it will increase to 19.1 million tons in 1999/00, 100,000 tons less than the level of consumption in 1997/98, and increase to 19.5 million tons in 2000/01.

Cotton consumption in China (Mainland) is expected to be 4.6 million tons in 1999/00 and 4.5 million tons in 2000/01. China will account for about one fourth of world cotton consumption and developments in the cotton and textile sectors in that country are expected to have significant impact on the world market. A substantial increase in Indian cotton consumption is expected for 1999/00 and 2000/01. Cotton consumption is expected to reach a record of 2.9 million tons within the next two years. USA, Germany and France, however, are expected to reduce their cotton consumption because of increasing textile imports. Recovery is not expected in East Asian countries as a group. Consumption levels in East Asia are expected to decline by 50,000 tons in 1999/00 and by 20,000 tons in 2000/01.

## **Yields**

The biggest strategic problem facing the world cotton industry – the failure of yields to rise in the 1990s – shows no sign of being solved. Between 1950/51 and 1991/92, world cotton yields rose at an average rate of about 2% per year, hitting new records at least once every three years. Rising yields allowed world cotton production to climb for four decades even with no growth in world area. In 1991/92, world production hit a record 20.7 million tons with a world yield of 598 kg/ha. In 1996/97, yields remained 22 kilograms below record

levels. The world average yield increased in 1997/98 to 592 kilograms, still 6 kilograms less than historic records. The average yield in 1998/99 was only 551 kg/ha and is expected to be 565 kg/ha in 1999/00, the eight consecutive season without setting a new record.

The U.S. yield reached 791 kilograms per hectare in 1987/88 and has not grown from that level in the eleven years since. Changes in the U.S. farm program, which emphasizes cost minimization over increased yields, make it unlikely that U.S. yields will start to rise. Cotton yields are also not increasing in India, Pakistan and Uzbekistan. Cotton yields are recovering in China (Mainland) and slightly increasing in Turkey.

The reason for no increase in yields is that, given the limitations in various countries, agronomic management of the cotton plant has reached optimization. The nature of limitations to higher productivity are different in different countries but it seems that the available recoverable potential under most production conditions has been utilized. Thus, the world cotton industry has entered into a long period of no growth in yields.

How yields can be improved? The answer to this question is eliminate limitations and yields will automatically increase. As estimated by the ICAC, about 55% of the world area dedicated to cotton is currently irrigated. In areas where shortage of irrigation water is a limitation, supply of irrigation water can improve yields. But, for significant and sustained improvement in yields across countries and regions, there is a need to develop new technologies. One of the new technologies is development of transgenic cottons.

### **Transgenic Cotton**

Development of transgenic cotton and other transgenic crops has opened an entirely new era in crop breeding. Now techniques are available to isolate non-cotton genes and induct them into the cotton plant for specific objectives. Currently, two such cottons are grown, Bt cotton resistant to insects and transgenic cotton resistant to herbicides. The United States is the first country to adopt transgenic cotton on commercial scale from 1996/97 and it is estimated that 45% of the total area was planted to transgenic varieties. In addition to the USA, Argentina, Australia, China, Mexico and South Africa also have gone into commercial production of Bt cotton. Spain may be planting during 1999. Colombia, Bolivia, Brazil, El Salvador, Greece, India, Israel, Paraguay, Thailand and Zimbabwe are in the process of testing Bt cotton.

Some countries still do not have an access to the technology. But, it is believed that either through collaboration with multinationals or development of their own capabilities, technology will be available to all countries. The technology is available and it has tremendous applications and hopes. About 2.6 million hectares or 8% of the world total area was grown under transgenic cotton in 1998/99. Some view transgenic cottons as a disposable technology and expendable resource. But the fact is that we are progressing toward a stage of directed breeding and the world cotton community will see drastic changes in the cotton plant planted today.

### **Technology Protection System**

After almost five years of research the USDA and Delta and Pine Land Company have developed a technology called "Technology Protection System (TPS) which produces infertile seeds." TPS is a clever; three gene system that forces the plant to produce a toxin that is fatal to its own seeds, compelling farmers to buy new seeds every year. TPS is a transgenic system comprised of a complex array of gene promoters which, in the normal state, are inactive. But, if the same seed carrying TPS has a treatment applied prior to sale, the treated seed will germinate as a normal seed but it will not produce a viable seed. The seed matures like a normal seed and is equally fit for feeding or oil extraction.

Researchers have manipulated the plant's DNA such that the suicide genes are under the control of yet another genetic mechanism, which suppresses the effect of suicide genes indefinitely. In the suppressed stage, transgenic plants having TPS produce fertile seeds. The TPS system can be activated at any stage. The fertile seeds will be sprayed with a chemical (in one version it is said to be antibiotic tetracycline in nature) called "inducer" which awakens the dormant self-infertility genes to overcome the suppression effect. Inducer application

revives the ability of the plant to produce infertile seed.

TPS varieties may become available in 2-3 years and farmers will have a choice to choose TPS or non-TPS varieties. TPS has its own advantages like biosafety of the transgenic species and expansion of transgenic technology to many more countries. But, TPS could be an additional financial burden on billions of poor farmers around the world. Subsistence farmers will be forced to buy seed every year and pay fee for TPS and technology fee for the novel gene. TPS technology could create a disaster in the germplasm through cross-pollination as out crossing could trigger epidemic of crop sterility.

### **Organic Cotton**

Organic production of cotton started from 1990/91 in Argentina, Australia, Turkey and the USA. Since then organic production of cotton has also been tried in Benin, Brazil, Egypt, Greece, India, Israel, Mozambique, Nicaragua, Paraguay, Peru, Senegal, Tanzania, Uganda, Zambia and Zimbabwe.

Some of the fundamental requirements of organic production are no chemicals, a transitional period and certification. There are many reasons to explain why organic production was started. It can also be claimed that it is a consumer driven initiative. Typically, producers of organic cotton expected lower cost of production mainly due to elimination of insecticides, lower yields and higher income due to premium price. It was expected that lower costs and premium in price will compensate the loss in yield and ultimately farmers would not suffer economic losses. It was expected that less environmental pollution, long-term viability of farming and safety from insecticide use would be a bonus.

So far, the highest quantity of organic cotton (12,833 tons) was produced in the world during 1995/96. 9,028 and 7,967 tons organic cotton was produced during 1996/97 and 1997/98 respectively. It seems that people are losing their interest in organic production. The International Cotton Advisory Committee has done a number of reports and papers on organic cotton. It is concluded that the following factors are responsible for the decline in organic production.

- No research has been undertaken on organic production.
- Elimination of insecticides did not reduce the cost.
- Conventional varieties are not suitable for organic conditions.
- Due to high insect pressure, loss in yield was more than expected.
- Organic production affected cropping intensity and consequently farm income.
- Price premium was not according to expectations.

### **Cost of Production**

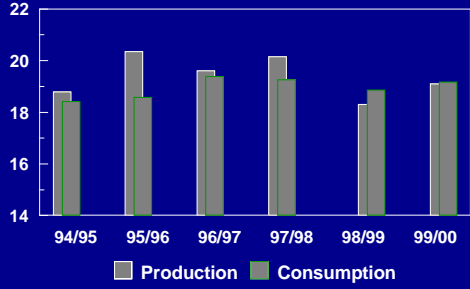
The cost of producing cotton is the most critical factor in deciding the area to be planted to cotton. Experience shows that countries have gone out of production only because it became expensive to produce cotton. In 1980/81, average yields in Guatemala were the 2<sup>nd</sup> highest in the world just behind yields in Israel. Guatemala stopped producing cotton in 1996/97, with cotton yields still 150 kg/ha above the world average and almost comparable to levels in the USA. The ICAC undertakes a survey of the cost of production of cotton in the world and the last report was published in October 1998. The data showed that among major exporting countries, it is most expensive to produce cotton in the USA.

Other conclusions from the last survey of the ICAC on cost of production are

- Input use has been optimized
- Cost/ha will increase at a slower rate
- Increase in input cost will increase cost/kg of lint
- It is expensive to produce rainfed cotton compared to irrigated cotton

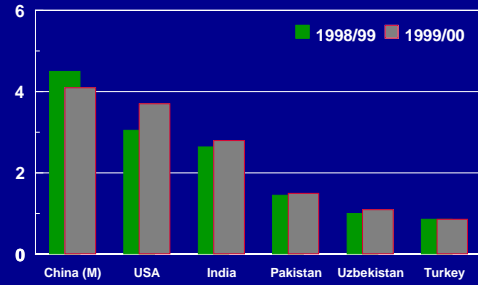
## WORLD COTTON MARKET

Million Tons



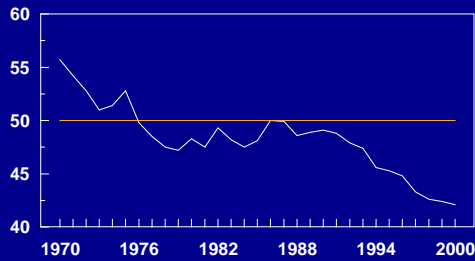
## PRODUCTION 1998-99

Million Tons



## COTTON'S SHARE OF THE WORLD TEXTILE MARKET

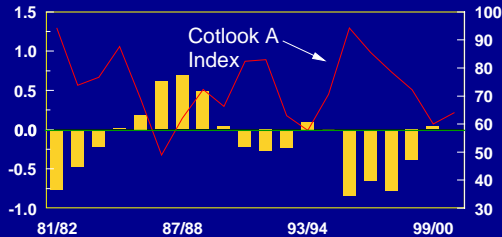
Percent



## NET EXPORTS CHINA (MAINLAND)

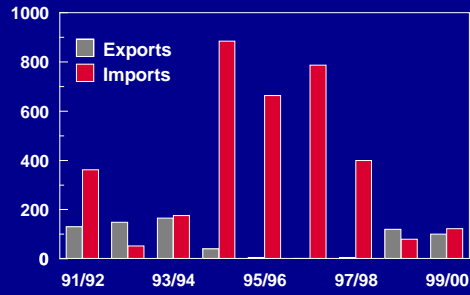
Million Tons

US Cents per Pound



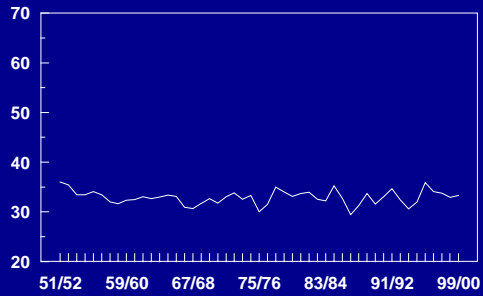
## CHINA (MAINLAND) TRADE

Thousand Tons



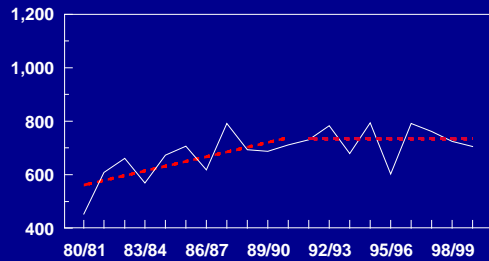
## WORLD COTTON AREA

Million hectares



## COTTON YIELDS UNITED STATES

Kilograms per hectare



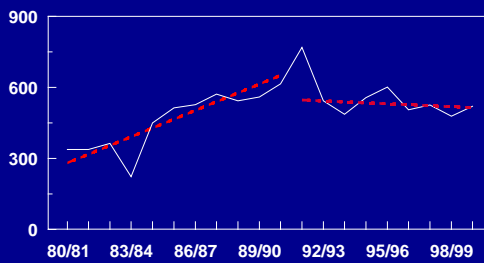
## COTTON YIELDS INDIA

Kilograms per hectare



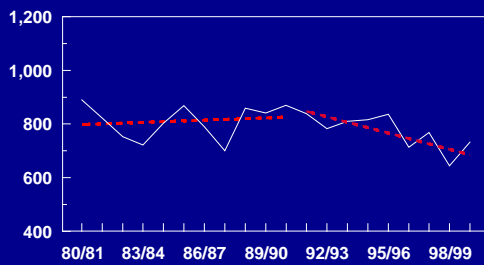
## COTTON YIELDS PAKISTAN

Kilograms per hectare



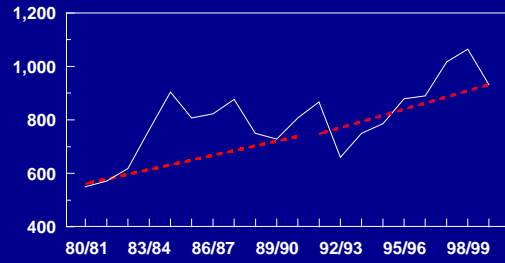
## COTTON YIELDS UZBEKISTAN

Kilograms per hectare



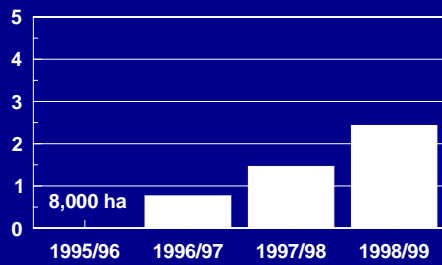
## COTTON YIELDS CHINA (MAINLAND)

Kilograms per hectare



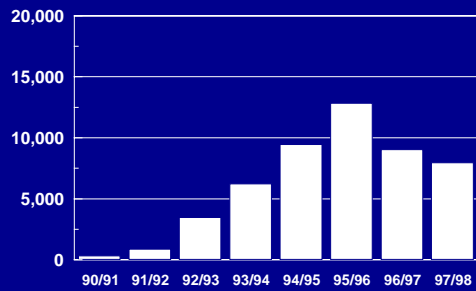
## TRANSGENIC COTTON IN THE USA

Million Ha



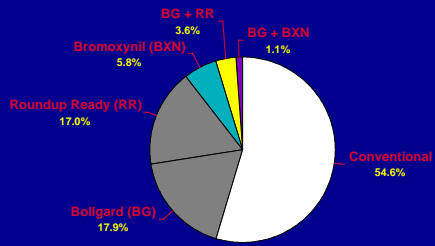
## ORGANIC COTTON

Tons

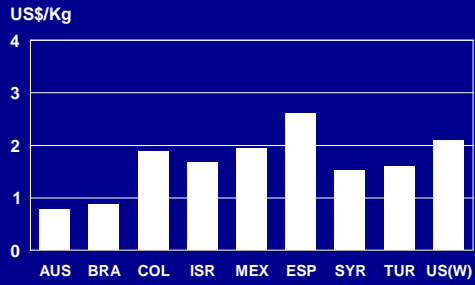




### COTTON VARIETIES IN THE US - 1998/99 (By Gene Type)



### COST OF PRODUCTION (High Yielding Countries Over 1,000 Kg lint)



### COST OF PRODUCTION (Exporting Countries)

