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Will India Lead?

EXPERT's Column

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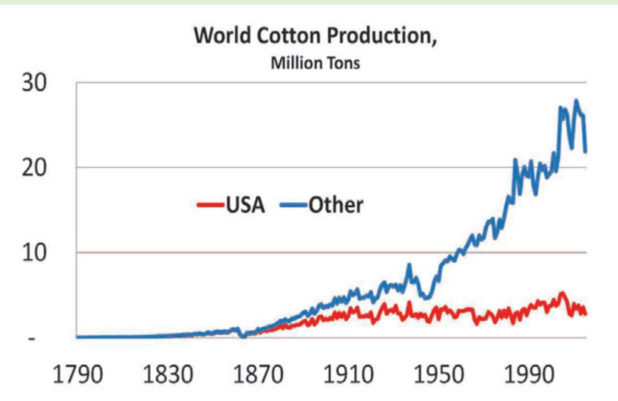
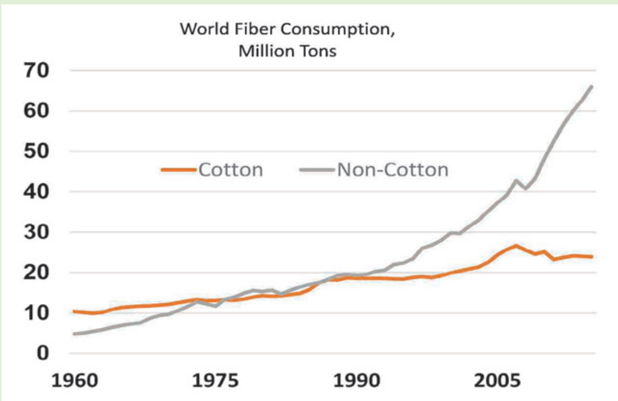
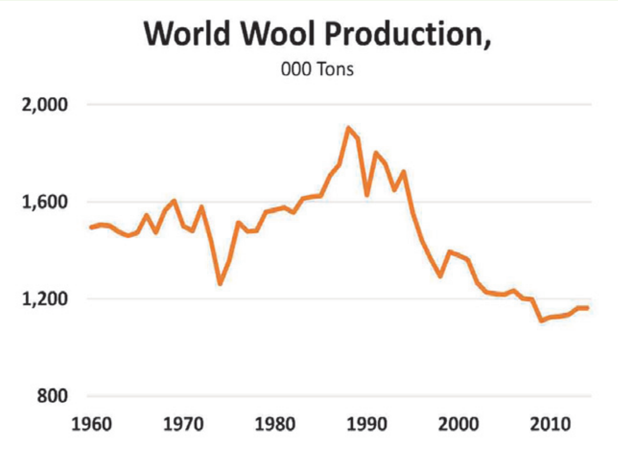
Cotton is an industry in decline. For approximately two centuries, cotton benefited from industrialisation, population growth and income growth to drive consumption higher. However, two centuries of an upward trend has come to an end unless structural changes in cotton's competitive situation are made.

At the time of the invention of the cotton saw gin in the 1790s, world production of cotton for commercial use was probably only about 2,000 tons of lint. (Commercial producers are distinct from what may have been millions of households producing yarn and fabric by hand for own-consumption using cotton harvested from wild plants or garden-like crops.)By the start of the civil war in the United States in 1861, world cotton production had climbed to about one million tons, and by the mid-1930s, prior to the start of World War II, world cotton use had reached about 4 million tons per year. Between the end of World War II and 2007, world cotton consumption climbed to 26.6 million tons. However, eight years later in 2015, despite population growth of 8% or 600 million, and world real GDP growth of 18% since 2007, world cotton consumption was still 2.9 million tons, or 11%, less than it was at its peak.

In the Age of Sail, all lines and sails on ships were made of natural fibres, mostly hemp and sisal for ropes, and linen for sails, and millions of tons of each fibre were produced each year. As late as the 1960s, world hemp production was still nearly 400,000 tons per year, sisal production totaled 750,000





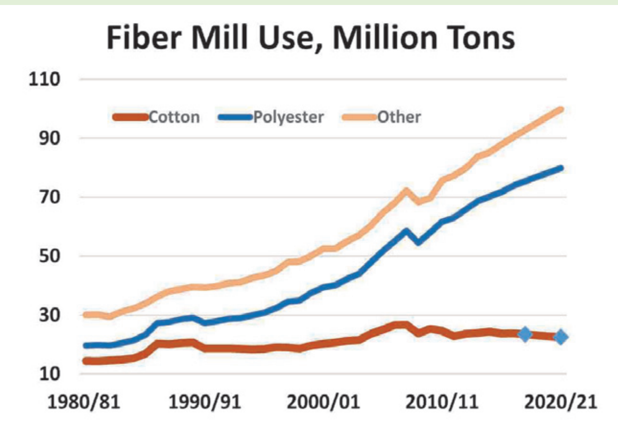


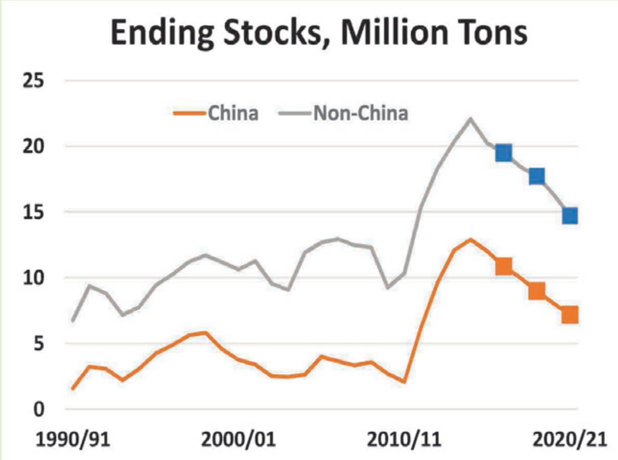
tons per year, and flax fibre production used to make linen fabric totaled about 700,000 tons. Today, with the exception of museums, all ships' lines and sails are made of nylon, polypropylene or polyester, and world production of hemp has fallen to less than 60,000 tons, sisal production has fallen to less than 300,000 tons, most of which is used in agricultural twines and cordage, and world linen production is estimated at 300,000 tons.

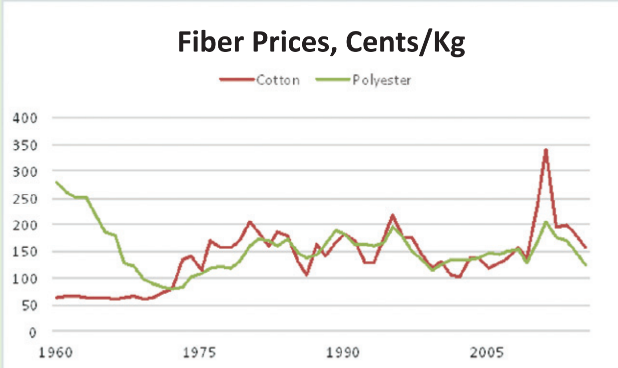
Prior to the advent of "fast fashion" and "casual Fridays," wool was a major apparel fibre. In the 1960s, wool accounted for 10% of world apparel fibre use, and production for all uses including carpets reached 1.8 million tons, clean basis, in the early 1990s. Today, wool accounts for 1% of world fibre use, and production has fallen to 1.2 million tons. Just as with wool and other natural fibres, the world may realise years from now that Peak Cotton has passed.

The Role of China

The primary reason for cotton's decline is the growth of polyester production, combined with the operation of the Chinese State Reserve. World production of polyester climbed from 5 million tons in 1980 to 9 million by 1990, to 19 million by 2000 and then to 37 million in 2010 and 50 million tons this year. Production of polyester in China has increased from about 10% of the world total in 1990 to about 70% today, and as shown by Ethridge, "Policy-







Source: Cotlook Limited, publisher of Cotton Outlook.

Driven Causes for Cotton's Decreasing Market Share of Fibres," this growth is a direct result of policy choices in China.

In addition to promoting polyester production, the Government of China maintains a strategic reserve of cotton, serving as a national buffer stock. China releases cotton to the domestic market from the reserve through a system of auctions when there is a shortage, and replenishes the reserve in times of abundance, thus supporting prices.

The result is that cotton consumption in China is being discouraged through a process of rationing associated with the operation of the State Reserve. At the same time, the same State Reserve withholds cotton from the world market, and therefore world cotton prices are being maintained above a level to which they would otherwise fall in competition with polyester.

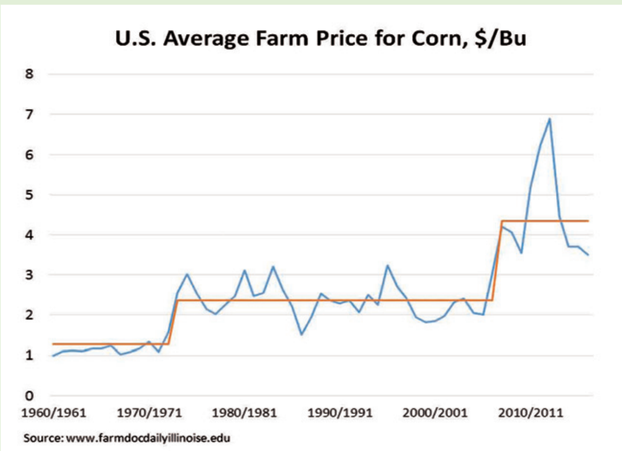
Relative fibre prices are extremely important in determining fibre market shares. When introduced in the 1950s, prices of polyester were far higher than those of cotton, but prices of polyester reached parity with cotton in 1972 and have been correlated in the decades since. The most recent 8-year interval, from 2008 to 2015, has been brutal to the competitive interests of cotton. During this period, cotton prices have averaged 42 cents per kilogram more than prices of polyester, a premium of 26%.

High cotton prices are undermining the competitiveness of cotton relative to polyester. Since 2007, cotton's share of world apparel fibre consumption has fallen from 38.4% to 27.6%, a staggering loss of market share of more than 10 percentage points. The volatility in cotton prices during 2008 and 2010/11, before China began building a state reserve in 2011, caused much demand destruction. Arguably however, China's persistence in maintaining a state reserve at a time while polyester prices have fallen to less than 50 cents per pound in China, is contributing to a continued slide in market share that now threatens the long term viability of cotton as an industry. It is not too strong a statement to say that the world cotton industry, and the welfare of millions of producers, is being held hostage to the intentions of the Government of China regarding industrial policies that promote polyester production and the cotton reserve that prevents cotton consumption.

Biofuel Mandates

As of 2016, 64 countries have biofuel mandates or targets for their domestic liquid fuel supplies. The mandates with the largest impacts are in the United States, the EU-27 and China. The U.S. government requires that 18 billion gallons of biofuel, primarily corn ethanol, be blended into the U.S. fuel supply during 2016, and approximately half of all the corn produced in the United States is devoted to biofuel production. In the EU-27, between 5% and 7.5% of liquid fuels must be composed of biofuels, and China hopes to reach a 10% biofuel share of the national fuel supply by 2020.

The result of the biofuel mandates is that prices of corn, and soybeans which are a substitute for corn in cattle rations, have moved structurally higher over the last decade. The U.S. average farm price for corn was $1.28 a bushel from the end of World War II to 1972/73 (a bushel of shelled corn is defined as 56 pounds or 25.4 kilograms). The average farm price rose to $2.36 through 2007/08, and since 2007/08 the average U.S. farm price has increased to $4.35. The structural increase in corn prices coincide with the announcement of biofuel mandates in 2007. Prices of soybeans have followed a similar pattern.



Meanwhile, the average level of the Cotlook A Index is the same today as it was during the 1970s, 1980s and 1990s, while costs of cotton production have been rising, while yields per hectare have been flat. As a result, with the prices of grains structurally higher while the price of cotton is the same as it has been for decades, farmers are exercising rational judgment and shifting land from cotton to grains where possible.

World cotton area has varied in a relatively narrow channel between 31 million hectares and 36 million hectares since 1950, with no trend either up or down. However, cotton is now at the bottom of that band, and with biofuel mandates encouraging shifts toward grain and oilseed production, cotton area may slip below 31 million hectares over the rest of this decade.

Can Cotton Unite? Will India Lead?

To avoid the fate that has befallen other natural fibres, the world cotton industry must unify to educate governments on the impacts of Chinese policies that promote production of manmade fibres while preventing the consumption of cotton. While cotton has many advantages over polyester, it must nevertheless compete with alternative fibres on the basis of price. No fibres, not even premium fibres such as wool and silk, much less cotton, can maintain demand for long if prices are uncompetitive. No matter what technical performance advantages a fibre may possess, nor how preferred by consumers, if the incentive to substitute becomes great enough, engineers and designers will find a way to utilise the cheaper fibre. Only India possesses the diplomatic and economic influence sufficient to lead a world effort to induce the Government of China to change its current mix of policy options that are proving so toxic to the interests of the cotton world.

To avoid the fate that has befallen other natural fibres, the world cotton industry must unify to sindustry practices in order to improve efficiencies and promote consumption. The industry needs to adopt worldwide universal permanent bale identification tags (PBI) with barcodes linked to standardised instrument testing of cotton (SITC). The industry must adopt and actually enforce a zero-tolerance policy for contract defaults. The industry needs to move toward universal adoption of standardised bale sizes, densities and coverings. And, the industry must adopt best practices in field and gin hygiene to reduce contamination. As the largest cotton producer, only India possesses the diplomatic and economic influence sufficient to lead such a world effort.

To avoid the fate that has befallen other natural fibres, the world cotton industry must unify to advocate for technology acceptance among consumers and regulators. The denial of technology by NGOs and government agencies is contributing to the strangulation of the world cotton industry and the loss of competitiveness to polyester. In order to compete with polyester, cotton yields have to rise and the cost of production must fall; this is a fundamental reality of a competitive world economy in which consumers exercise choice based on fashion, fit, colour, feel, price, availability and other factors. If cotton cannot supply market demands at prices consumers will pay, cotton will go the way of wool, linen, silk, ramie, hemp, sisal and other fibres whose markets were once measured in millions of tons and are now niche fibres.

It is technology that will enable yields to rise. It is technology that will enable farmers to produce more cotton with less resource use, thus lowering real costs and environmental impacts, and it is technology that will enable an improvement in intrinsic fiber quality parameters to meet consumer preferences. But, just as conservative politicians in the United States reject the science underlying global warming, so NGOs, thought leaders and regulators in the United States, and especially in Europe, reject the science underlying modern agricultural production technologies. As the largest cotton producer, only India possesses the diplomatic and economic influence sufficient to lead an effort to overcome the trend toward technology denial now building in the United States and Europe.

Will India Lead?

For approximately a century, since World War I, the United States has been the de facto trend setter, innovation developer and political leader of the cotton industry. However, the United States is now in decline within the world of cotton. With 2.8 million tons of production in 2015/16, the United States accounted for just 13% of the world total, the lowest proportion of world cotton production accounted for by the United States since the invention of the saw gin in the 1790s.

India is now the largest cotton producer, the second largest exporter, and within a few years India will be the largest producer of cotton textiles. With increases in economic power, will India have the political capacity, the judgment, the temperament and above all, the national will, to supplant the United States in leadership of the cotton world?

(The views expressed in this column are of the author and not that of Cotton Association of India)

Cotton Consumption - Cotton Year-wise

(In Lakh bales)

Month	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15 (P)	2015-16 (P)
Oct.	17.33	18.32	16.54	18.13	22.09	17.77	21.84	24.03	24.17	24.70
Nov.	17.81	16.94	16.94	18.47	21.09	18.34	21.09	22.96	25.05	23.34
Dec.	18.49	18.86	17.98	19.49	22.57	20.13	22.63	25.16	25.89	25.47
Jan.	18.22	18.54	16.93	19.54	22.1	20.33	23.3	25.19	25.77	25.24
Feb.	17.11	18.14	16.23	18.81	20.23	20.31	22.24	23.22	24.58	24.62
March	18.39	18.45	17.51	20.01	21.77	20.38	23.61	25.07	26.18	25.62
April	18.06	17.98	17.12	20.53	20.17	20.31	23.22	24.32	25.57	24.78
May	17.89	18.95	17.83	20.93	18.64	21.27	22.85	24.38	25.62	
June	17.85	18.55	18.01	20.71	18.23	21.17	22.51	24.11	25.61	
July	18.42	18.5	18.98	22.11	19	22.14	24.11	24.54	25.56	
Aug.	18.58	17.62	18.59	21.73	18.64	22.08	24.23	24.46	25.86	
Sept.	18.03	16.9	18.29	21.42	21.71	21.46	23.7	25.81	24.58	
Total	**216.18**	**217.75**	**210.96**	**241.88**	**246.23**	**245.47**	**275.34**	**293.24**	**304.43**	**173.77**

(P) = Provisional

Source: Office of the Textile Commissioner

Development of Advanced Mapping Populations in Cotton

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Most of the traits that are of interest to cotton breeders, such as yield, fiber quality, stress tolerance and so on, are complex traits controlled by a large number of quantitative trait loci (QTLs) and influenced by the environment. Conventional breeding methods made great strides in the enhancement of cotton fiber yield and quality. However, the most interesting traits, especially those manifesting continuous variation, may be exploited more effectively if their underlying genetic factors could be precisely determined in terms of their effect and direction. This knowledge has been greatly advanced by the development of various types of DNA-based markers and QTL analysis software. Conventional methods of interspecific introgression in cotton have traditionally been hobbled by a number of impediments, including:

- Complex antagonistic relationships among important traits;
- Cytogenetic differences among species due to different ploidy levels, meiotic affinity and chromosomal structural differences, including translocations and inversions;
- "Linkage drag effects" leading to poor agronomic qualities;
- Reduced recombination rates;
- Loss of alien genetic material in early generations;
- Hybrid sterility;
- Complex genetic interactions, such as Muller-Dobzhansky complexes; and
- Distorted segregation (Endrizzi et al., 1985). Such limitations are commonly encountered in crosses of G.hirsutum with diploid species, but most of them also apply to crosses with other allotetraploid cotton species.

ICAC

Conventional mapping populations such as F_2, backcross, recombinant inbred lines (RILs), and doubled haploids (DH) have been extensively used in cotton for mapping both the major genes and quantitative trait loci (QTLs). All these mapping populations are simpler to generate, but have one or another of the limitations listed above. The F_2 and backcross mapping populations are the simplest, but are not efficient for QTL mapping because they cannot be replicated over entire environments and single plant data are not reliable. Recombinant inbred lines and double haploids, on the other hand, are immortal populations; they can be replicated over locations and years, but both undergo limited recombination events and any mapping analysis done with these populations may be hampered by the masking effects of major QTLs and the epistatic interactions of multiple QTLs. Advanced mapping populations, including advanced backcross (AB) QTL lines, backcross inbred lines (BILs), advanced intercrossed lines (AILs), near isogenic lines (NILs), chromosome substitution lines (CSL), high throughput genotypes CSL, multiparent advanced generation inter-cross (MAGIC), association panels, and nested association mapping (NAM) populations potentially address the limitations of conventional mapping populations and are likely to introduce a paradigm shift in the identification of QTLs of agronomical and industrial importance in cotton. A brief account of each of the advanced mapping populations is presented below.

Advanced Backcross QTL Analysis

This method, proposed by Tanksley and Nelson (1996), is intended to combine the distinct steps of QTL discovery from wild, un-adapted germplasm and transferring them together into elite lines. Otherwise, in a typical plant breeding program, the first step would be to identify the QTLs from related species, either wild forms or landraces. The second step would be to transfer the QTLs identified in the first phase into an elite genetic background, but this lengthens the time required to develop a cultivar. In their paper, Tanksley and Nelson further suggested that novel and positive alleles need to be introduced into elite varieties so that the genetic base of crop plants may be broadened and the rate of genetic improvement enhanced. In this strategy, an otherwise elite line/ variety is crossed with the wild species, or un-adapted donor, to generate an F1 hybrid, which is then backcrossed to the recipient parent (elite line/variety) to develop a BC1F1 population. This population is subjected to a visual selection to weed out plants with defects such as sterility, susceptibility to pathogens, shattering, etc. The selected plants are then crossed with the recurrent parent to generate a BC2F1 population. Even though the parents are subjected to polymorphic analysis employing molecular markers, the QTL analysis is not carried out in the BC2F1 population and is postponed until the BC2 or BC3 generation. Some of the benefits of advanced backcross populations over conventional populations for QTL analysis include: high frequency of desirable alleles and early recovery of QTL-near isogenic lines.

Backcross Inbred Lines

Despite the acknowledged importance of developing recombinant inbred line populations from interspecific crosses of cotton, the fact is that interspecific incompatibilities have hampered the successful use of recombinant inbred line populations in marker and QTL mapping. The use of backcross inbred lines was a useful tool with which to map genes and introgress them into the genetic backgrounds of cultivated species. Backcross inbred lines are derived by crossing a related or wild species with a cultivated one and backcrossing it with cultivated parents several times after the initial cross, all the while selecting for the target trait in each generation. For the purposes of genetic analysis, the advantages of using backcross inbred lines include:

i) Being able to work with lines sharing a high degree of genetic and morphological similarities, which makes it possible to arrive at more precise estimates of quantitative traits;

ii) Having the opportunity to study QTL-environment interactions more accurately; and

iii) Having the possibility of relatively rapid and straightforward utilization of backcross inbred lines for commercial plant breeding. Backcross inbred lines have been generated for mapping QTLs for yield and fiber quality traits from a cross between G. hirsutum x G. barbadense through two generations of backcrossing using G. hirsutum as the recurrent parent followed by four generations of self-pollination (Yu et al., 2013).

Near Isogenic Lines

An alternative type of immortal experimental population, one commonly used with plant species, is made up of sets of introgression lines or near isogenic lines obtained through repeated backcrossing and genotyping. Unlike backcross inbred lines, near isogenic lines may differ at a limited number of loci. Comparison of near isogenic lines with recombinant inbred lines showed that in the near isogenic lines population smaller-effect QTLs could be detected with more precision than in the recombinant inbred line population, although their localization resolution may be lower. Near isogenic lines have been developed in various studies to be capable of a much finer mapping of QTLs that have been identified in recombinant inbred lines. But development of genome-wide near isogenic lines can better serve the purpose in terms of QTL detection power. In general, when attempting to increase the mapping power of recombinant inbred lines, the size of the population is more important than the number of replicates, whereas for near isogenic lines, several replicates are absolutely required (Keurentjes et al., 2007).

Advanced Intercross Lines (AILs)

Advanced intercrossed lines are experimental populations that can provide more accurate estimates of QTL map locations than conventional mapping populations. An advanced intercrossed line is produced by randomly, albeit sequentially, intercrossing a population that initially originated from a cross between two inbred lines or some variant thereof. This provides an increasing probability of recombination between any two loci. Consequently, the genetic length of the entire genome is stretched, and the QTLs may be identified with much greater precision than with a conventional recombinant inbred line population (Darvasi and Sorrel, 1995). Advanced intercrossed lines derived from crosses between known inbred lines may be a useful resource for fine genetic mapping as well; however, it takes additional time to generate a new set of inbreds after intermating.

Chromosomal Substitution Lines

A Chromosomal Substitution Line (CSL) is a line in which a single chromosome from a donor genotype is substituted into the genome of a recipient genotype using the appropriate aneuploid stock. For its development, the disomic donor genotype is first crossed as the male with recipient monosomic stock. The monosomic progeny will have only one copy of the monosomic chromosome originating in the donor genotype. The monosomic donor chromosome has no homologous pairing partner; hence, there is no opportunity for it to recombine. The monosomic recipient is then repeatedly crossed to monosomic F1 as the recurrent female parent. Backcrossing is then continued until the recipient background is recovered to the desired level to produce a monosomic substitution line. The monosomic substitution line is selfed to obtain disomic substitution lines. CSLs will prove to be useful in the study of the effect of a donor chromosome on the recipient parent background, particularly to find disease resistant progeny. G. barbadense Chromosomal Substitution Lines were developed from TM-I cytogenetic stock and they have been evaluated for various agronomic and fiber quality traits (Stelly et al., 2005).

Chromosome Segment Substitution Lines

Chromosome Segment Substitution Lines are introgression lines that have a small portion of the genome introgressed from another line or species and a set of lines encompass the whole chromosome(s). They are developed in intraspecific as well as interspecific crosses with a series of backcrosses and using DNA markers to identify individual lines. Chromosome Segment Substitution Lines (CSSLs) are powerful QTL mapping populations that have been used to elucidate the molecular basis of traits of interest, especially of wild species (Ali et al., 2010). A major limitation of CSSLs/backcross inbred lines is that unidentified introgressions of small, untargeted chromosomal segments, which have not been tagged with markers, sometimes generate experimental noise that makes it more difficult to detect QTL effects in particular regions of the chromosome. However, this problem is more severe in the backcross inbred lines than in CSSLs. Second, it may be difficult to detect phenotypic differences generated by a combination of two or more donor alleles in different chromosomal regions. In this case, the mapping resolution of the respective QTLs can be improved by fine mapping to develop near isogenic lines using the CSSLs/backcross inbred lines as base materials (Fukuoka et al., 2010). Graphical genotyping software programs, such as GGT (van Berloo, 2008) or CSSLs Finder (http://mapdisto.free.fr/CSSLFinder), are very useful for the development of CSSLs. The CSSL undergoes high-throughput genotyping by whole-genome resequencing, thus combining the advantages of an ultra highquality physical map with high mapping accuracy to produce CSSL that may be referred to as "High throughput genotyped CSSL".

Association Panels

In the past two decades, the availability of abundant molecular markers has made it possible to tag QTL-harboring functional genes through a routine process known as family-based linkage mapping, and through this method a large number of QTLs for fiber quality, yield and its components, as well as biotic stresses, including nematode resistance, Verticillium wilt resistance and Fusarium wilt resistance have been identified and reported in cotton. However, out of these reported QTLs, only a few could be confirmed in subsequent studies, and actually applied in breeding programs. This may be due to population-specific QTLs and to limited genetic recombination events used to generate the experimental populations employed in linkage mapping, thus making it difficult to map QTLs with high resolution. Given its potential to exploit all the recombination events that have occurred in the evolutionary history of natural populations, linkage disequilibrium (LD) based association mapping (AM) has become a powerful method that may be used in many plant species, including cotton, to dissect complex traits and identify causal variations with only modest effects on target traits. For this purpose, association panels are treated as open mapping populations that utilize a sampling of individuals taken from germplasm collections or from a natural population. An association panel of 356 Chinese upland cotton germplasm lines was used to identify marker-trait association for fiber quality traits. A total of 59 significant associations were found between 41 SSR markers and 5 fiber quality traits (Mei et al., 2014). Among the major limitations of using association panels are population stratification and an unequal distribution of alleles within a population, which results in non-functional, spurious associations (Knowler et al., 1988).

(to be continued)

Source : The ICAC Recorder,
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SAGA OF THE COTTON EXCHANGE

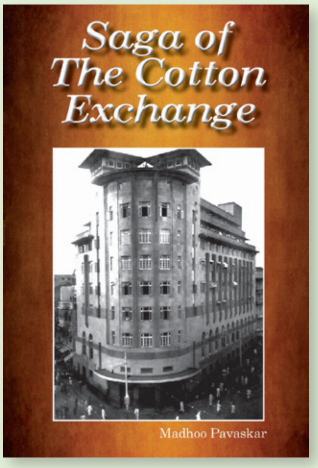
By Madhoo Pavaskar

Chapter 10

Competition with the State

A Rude Shock

Despite the heroic show of unity and strength by the cotton trade and the valiant struggle that it launched for its survival against the all powerful government authorities, the then Union Minister for Foreign Trade, Mr. L.N. Mishra, announced in the Lok Sabha on July 31, 1970, that the government had established on that day the Cotton Corporation of India in Bombay to take over the entire import trade in cotton and also to make a beginning by undertaking purchases in the field of domestic trade. The announcement came as a surprise and shock to the entire cotton trade. The Corporation started functioning from September 2, 1970 and cotton imports were canalised through it with effect from September 15, 1970.



Even though the Government of India had given an assurance that the Cotton Corporation of India (CCI) would make purchases in the domestic market to give price support to cotton growers in Maharashtra, it was thought that CCI is unlikely to protect the interests of the cotton growers. The Maharashtra government was already perturbed by the declining cotton production and the falling cotton yields in the State, which were the lowest in the country. Instead of admitting the failure of its own agricultural plans, the State government dubbed the private cotton trade as the villain of the piece, and led its legislators to believe that the only panacea for all the ills of the cotton economy in the State was the monopoly procurement scheme for kapas. The Maharashtra Raw Cotton (Procurement, Processing and Marketing) Act was passed in October 1971 and the scheme was officially launched on August 1, 1972, by the Maharashtra State Cooperative Marketing Federation, which was nominated as the principal agent of the State to implement the scheme.

The establishment of the Cotton Corporation of India and the introduction of the monopoly kapas procurement scheme in Maharashtra, no doubt, gave a serious jolt to King Cotton. For some time, it seemed that complete nationalisation of the cotton trade was round the corner. But, as time elapsed, the State agencies realised that the intricacies of cotton marketing were too complex for them to cope with. After the private trade recovered from the initial shock, it realised that it can continue to function in the new environment in a spirit of both competition and co-operation with the State agencies. Small surprise, not only has the private trade survived the rude shock of State intervention, but it still continues to have a lion's share in the total cotton business of the country, even more than a decade after the establishment of the state marketing agencies. Paradoxically, the triumph of the cotton merchants during these trying years has been due as much as to their articulate expertise and skills as to the miserable failure of the public sector institutions to live up to their expectations, though both the Central and Maharashtra governments left no stone unturned to arm them with ample resources and power to eliminate cottonmen.

Arming the CCI

Although the Cotton Corporation of India was set up mainly as a canalising agency for import of foreign cotton, as luck would have it, its entry coincided with the expansion in the domestic cotton production. Hence, since its inception, CCI was also entrusted with the task of purchase, sale and equitable distribution of domestic cotton to safegaurd the interest of the cotton growers. As early as in April 1972, it was even directed to perform the price support operations to maintain the growers' interests in cotton production, and to ensure that they are assured of the minimum prices fixed by the government. Later, in October 1975, the Corporation was directed to procure cotton to meet the requirement of the public sector National Textile Corporation—which runs the sick mills—on the basis of the indents placed by it.

The Cotton Corporation of India received a further shot in the arm in August 1978, when the new Textile Policy enjoined it with the responsibility of maintaining cotton prices at reasonable levels, without wide fluctuations throughout the years, while protecting the farmers from exploitation by middlemen. With this end in view, CCI was required

(i) to intervene in the market so as to prevent cotton prices from falling below the prescribed minimum;
(ii) to enter into commercial transactions, and build up and operate buffer stock; and
(iii) to purchase cotton for not only the NTC mills but also others in the private as well as the State sector, especially the weaker units among them.

With its entry into the domestic market, CCI also began to make inroads into the export market to clear its accumulated stocks from the very first year of its operation. In May 1975 the Corporation was also appointed as a canalising agency for export of long staple cotton. Thus, CCI is now well equipped, at least, statutorily to operate in the domestic as well as international markets (for both import and export) of cotton.

New Lease to Monopoly

The main objectives of the Maharashtra Monopoly Procurement Scheme are two, namely,
(i) to ensure fair and remunerative prices to the cotton growers in Maharashtra by eliminating middlemen altogether, and
(ii) to bring about stability and growth in the overall production of cotton in the State.

After the introduction of the scheme, the State government became the sole buyer of kapas grown in Maharashtra and the cotton cultivators in the State were prohibited from selling kapas to any one, except the Maharashtra State Cooperative Marketing Federation. The scheme assures the cotton growers guaranteed prices for different varieties of kapas, which are fixed every year. In addition, the grower may also get a 'bonus' at the end of each season, if the final net realisation on the sales of cotton lint, cottonseed and cotton waste (which are the products of kapas) is higher than the guaranteed prices.

The scheme had a chequered career through the last more than a decade, and was at times suspended, albeit for short periods, for either want of funds or large scale smuggling of kapas out of Maharashtra. However, despite difficulties, the State government has preferred to persist with this star-crossed scheme, and after the lapse of the original legislation, a new enactment was brought on the Statute Book in 1981 to give a fresh lease of life to it.

Failure of State Agencies

Be that as it may, the entry of the public sector led to the shrinkage of share of the private trade in cotton marketing. Before the entry of the two State agencies, almost 90 per cent of the country's kapas production was sold through the private trade, while the co-operatives handled the rest. Thereafter, the share of the private trade declined steadily. In fact, in recent years, together with the co-operatives, the two public sector agencies market nearly 40 per cent of the kapas output. CCI's purchases are now hovering around 10 to 12 lakh bales a year, representing about 13 to 14 per cent of the cotton crop in the country. The Maharashtra monopoly scheme's share has been fluctuating erratically from year to year, depending upon the size of the cotton production in Maharashtra and the extent of smuggling of kapas out of the State. Nevertheless, for the last few years, its share has averaged around 20 per cent of the all-India cotton output.

With the State agencies and co-operatives controlling the commanding heights of the cotton marketing economy, one may legitimately ask : Has the State entry in the kapas and cotton markets benefited the kapas growers and consumers of cloth? Disappointingly, the answer is in the negative. Surprisingly, "after the State intervention in cotton marketing since 1971-72, the cotton prices were, more often than not, below their parity levels in relation to the price index of not only 'all commodities', but also of other agriculture crops. As a result, cotton farmers received, by and large, lower incomes than the producers of most other commodities in the primary and secondary sectors." Worse still, contrary to expectations, "the band of seasonal variations in cotton prices also tended to expand, rather than shrink, following the entry of the State agencies in cotton marketing."

Depressing cotton prices apart, a study of the financial results of the operations under the monopoly procurement scheme in Maharashtra from 1972-73 to 1978-79 revealed that the farmers' share did not average more than 87 per cent of the gross income of the scheme for all the seven years put together. In contrast, during the 1960s in the four selected assembling markets of Maharashtra, the cotton farmer's share in the final sales of cotton lint and cottonseed at the terminal markets generally hovered around 90 per cent. Clearly, not only did the Maharashtra monopoly scheme fail to raise the cotton grower's share in the consumer's rupee, but, more disappointingly, such share has actually declined from what it was earlier.

(to be continued)

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UPCOUNTRY SPOT RATES

(Rs./Qtl)

Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Strength /GPT	13th	14th	15th	16th	17th	18th
Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]							Spot Rate (Upcountry) 2015-16 Crop JUNE 2016					
1	P/H/R	ICS-101	Fine	Below 22mm	5.0-7.0	15	9336 (33200)	9336 (33200)	9336 (33200)	9336 (33200)	9336 (33200)	9336 (33200)
2	P/H/R	ICS-201	Fine	Below 22mm	5.0-7.0	15	9476 (33700)	9476 (33700)	9476 (33700)	9476 (33700)	9476 (33700)	9476 (33700)
3	GUJ	ICS-102	Fine	22mm	4.0-6.0	20	6636 (23600)	6749 (24000)	6749 (24000)	6749 (24000)	6805 (24200)	6861 (24400)
4	KAR	ICS-103	Fine	23mm	4.0-5.5	21	8408 (29900)	8520 (30300)	8520 (30300)	8520 (30300)	8577 (30500)	8633 (30700)
5	M/M	ICS-104	Fine	24mm	4.0-5.0	23	9589 (34100)	9701 (34500)	9701 (34500)	9701 (34500)	9758 (34700)	9814 (34900)
6	P/H/R	ICS-202	Fine	26mm	3.5-4.9	26	10686 (38000)	10770 (38300)	10854 (38600)	11023 (39200)	11079 (39400)	11192 (39800)
7	M/M/A	ICS-105	Fine	26mm	3.0-3.4	25	9251 (32900)	9420 (33500)	9448 (33600)	9448 (33600)	9533 (33900)	9589 (34100)
8	M/M/A	ICS-105	Fine	26mm	3.5-4.9	25	10095 (35900)	10264 (36500)	10292 (36600)	10292 (36600)	10376 (36900)	10432 (37100)
9	P/H/R	ICS-105	Fine	27mm	3.5.4.9	26	10939 (38900)	11023 (39200)	11107 (39500)	11276 (40100)	11332 (40300)	11445 (40700)
10	M/M/A	ICS-105	Fine	27mm	3.0-3.4	26	9617 (34200)	9786 (34800)	9814 (34900)	9814 (34900)	9898 (35200)	9954 (35400)
11	M/M/A	ICS-105	Fine	27mm	3.5-4.9	26	10432 (37100)	10601 (37700)	10629 (37800)	10629 (37800)	10714 (38100)	10770 (38300)
12	P/H/R	ICS-105	Fine	28mm	3.5-4.9	27	11079 (39400)	11164 (39700)	11248 (40000)	11417 (40600)	11473 (40800)	11585 (41200)
13	M/M/A	ICS-105	Fine	28mm	3.5-4.9	27	10854 (38600)	10995 (39100)	11023 (39200)	11023 (39200)	11079 (39400)	11135 (39600)
14	GUJ	ICS-105	Fine	28mm	3.5-4.9	27	10770 (38300)	10911 (38800)	10967 (39000)	10967 (39000)	11051 (39300)	11135 (39600)
15	M/M/A/K	ICS-105	Fine	29mm	3.5-4.9	28	11079 (39400)	11220 (39900)	11248 (40000)	11248 (40000)	11304 (40200)	11360 (40400)
16	GUJ	ICS-105	Fine	29mm	3.5-4.9	28	10967 (39000)	11107 (39500)	11164 (39700)	11164 (39700)	11248 (40000)	11332 (40300)
17	M/M/A/K	ICS-105	Fine	30mm	3.5-4.9	29	11332 (40300)	11473 (40800)	11501 (40900)	11501 (40900)	11557 (41100)	11585 (41200)
18	M/M/A/K/T/O	ICS-105	Fine	31mm	3.5-4.9	30	11614 (41300)	11754 (41800)	11782 (41900)	11782 (41900)	11838 (42100)	11867 (42200)
19	A/K/T/O	ICS-106	Fine	32mm	3.5-4.9	31	11782 (41900)	11923 (42400)	11951 (42500)	11951 (42500)	12007 (42700)	12035 (42800)
20	M(P)/K/T	ICS-107	Fine	34mm	3.0-3.8	33	14763 (52500)	14904 (53000)	14932 (53100)	14932 (53100)	15016 (53400)	15016 (53400)

(Note: Figures in bracket indicate prices in Rs./Candy)