COTTON TO THE CONSUMER

By Lawrence H. Shaw, Executive Director, International Cotton Advisory Committee
Washington DC USA

Paper for the 7th Australian Cotton Conference, August 11, 1994, Hotel Conrad
Broadbeach, Queensland, Australia

Cotton is but one of a number of fibers which the consumer can use to satisfy the need for clothing, household articles and industrial products. Among natural products, in addition to cotton, there are animal furs, animal hairs such as wool and mohair, silk, flax, jute, coir, sisal, henequen, abaca, ramie and minerals such as asbestos. Among synthetic products there are nylon, polyester, acrylics, polypropylene and glass fibers. Rayon and its filament form -- acetate -- are technically artificial fibers, made from natural cellulose usually in wood but dissolved and recombined in a fiber form.

Cotton has never had 100% of the fiber market, wool and silk have been around at least as long as cotton. In modern times, the cellulosic fibers were developed in the late 19th century and nylon in the 1920s and had together made significant inroads in fiber markets by the beginning of the 1960s. In 1960, cotton had 68% of the textile market, wool 10%, cellulosics 17% and synthetics 5%.

The last 30 or more years have been the heyday of the plastic fibers. Synthetic fibers in 1993 represented 43% of the market, compared to cotton's 47%, wool's 4% and cellulosic's 6%. What has been the attraction of these plastic fibers that have led to their replacement in only three decades of half of wool's market, two-third's of rayon's and nearly a third of cotton's?

Initially, it wasn't price. Polyester sold for US$1 in 1960 compared to about US$.25 for cotton. Partially, perhaps, to the final consumer it was the novelty of the new fibers with their new characteristics. To the intermediate consumer, the textile industry, the plastic fibers offered a great deal: (1) They had a regular quality, which didn't differ from purchase to purchase; (2) They did not come with a variety of contaminants from oil and rubber to rocks and stones and bits of colored fabric and polypropylene string; (3) They were available at an essentially fixed price without any concerns about supply; (4) They offered the possibility of greatly simplifying the production of textiles by eliminating the spinning process.

The plastic fibers, manufactured in factories, offered advantages to business managers because their prices were predictable and unchanging from day to day and week to week. It was also not necessary to maintain inventories of any significant quantities at the textile plant. The fact that risk

was reduced and capital costs lowered by using synthetic fibers was a key advantage to the new business-school educated managers of the 1960s and 1970s.

The plastic fibers also offered advantages to plant engineers. Clearly, the manufactured product had advantages in terms of an even-running material at the spinning plant. The fibers were all the same size and shape. There were labor savings because the mixing process was eliminated or simplified and no one had to watch for contaminants. Quality control was easier and yarn formation more predictable. Even more important was the possibility of eliminating the spinning process altogether. The filament which was produced in the extrusion process could be directly converted to a yarn. This filament yarn could then be purchased by knitters, who could convert the filament to fabric with the investment of only the capital to purchase some knitting machines and hire some floorspace. Thus the birth of the 100% polyester double-knit fabric which was wildly converted to leisure suits and women's jackets and pants.

Fortunately for cotton, the end-result of the polyester double-knit experiment were garments that were harsh to the hand, picked, held odors and were hot in summer and cold in winter. Spun fabrics had a reprieve. But the advantages of manufactured fiber meant that textile engineers still tried to use as much of them as they could. High polyester content blends were carried to their extreme. Bedsheets of 80% polyester were said to be so slippery that it was hard to stay in bed.

A tendency to prefer natural fibers, combined with increased price competitiveness beginning in the mid-1970s and technological advances which led to improved performance of knitted cotton yarns resulted in increased demand for higher cotton content blends in the 1980s. Cotton's share of market at the world level stabilized, due to gains in the developed countries which offset losses in the developing countries.

The rest of this decade will be a challenge for cotton. Supply and demand fundamentals suggest that today's higher prices for cotton will continue in the next two seasons. Cotton is currently sells at a 20 cent a pound premium to polyester in much of Europe, and this level of price difference is enough to make textile business managers look for ways to up polyester in blends. Cotton also seems to be under the threat of environmental boycott because chemicals are used in its production. And the synthetic fiber manufacturers continue to aim their products at equaling the qualities of cotton's hand and comfort.

What can the producer do to protect cotton's competitive advantage? Well, what do spinners, the producers' immediate customer say they want when buying cotton? According to recent surveys,

spinners say they want to have even-running fiber, which does not have neps or contaminants, is not sticky and which does not contain large amounts of short fiber.

These concerns are not new. Throughout my career in cotton I have listened to complaints from spinners about neps and contamination of cotton with foreign matter.
Both problems are very difficult ones for the industry. Neps defined carefully as knots of entangled fibers can occur any time in the process of the movement of cotton fibers from the plant to the final production of yarn. They can arise from picking, seed cotton transport or cleaning, ginning, lint cleaning, bale opening and mixing at the textile mill, lint cleaning at the mill, carding, combing. In this situation, everyone denies responsibility. It is also very difficult to do detective work when the cotton is harvested and ginned in one country and mixed with the cottons from twenty other countries and spun in another country many thousand miles away.

Despite the intractability of a solution, neps are an important problem causing waste and inefficiency in textile operations through reduced yarn strength and dye imperfections in finished fabric. At ICAC our first Review Article on Cotton Production Research was on Cotton Fibre Impurities: Neps, Motes and Seed Coat Fragments to try to focus attention on this problem. As a result of this outstanding article, written by Lucien Verschraege of Belgium, we became aware of how important it was to define the problem before searching for a solution. Neps, masses of entangled fibers, are not "naps" (loosely matted fibers which become separated in carding), nor are they motes (immature seeds with attached fibers) or seed coat fragments (which are usually found together with lint entanglements). Naps are not a problem; motes and seed coat fragments are either production or ginning problems which can be addressed by producers. Reducing the number of true neps will require collaboration all along the production line from farmers to spinners.

I have brought with me a present made to me by Japanese spinners and traders seven years ago when I first joined the ICAC. It is a small bag of the various things which spinners find inside cotton bales when they are opened at the mill. In the bag, you will find bits of colored string and fabric, paper, twine and rubber. Knowing that I would have to carry the bag back to Washington, I was spared samples of the large rocks and pieces of metal that also sometimes find their way into bales, and also the partially eaten hamburgers complete with polyethylene cartons.

Foreign matter such as in the bag is an increasing problem in highly mechanized textile operations. When bales of cotton were opened by hand, there were eyes available to spot the pieces of fabric and string; now that these operations can be made automatic

textile mills are forced to choose between efficient, low cost automatic methods and less efficient, higher cost methods involving hand searching for contaminants. If they use synthetic fibers, they don't have to choose.

Stickiness is a problem which all textile mills want to avoid. Sticky cotton will not spin as it sticks to rollers and requires machinery to be shut down for cleaning. The mill's first choice is to never buy sticky cotton again or to never buy cotton again from the country where its experience with sticky cotton originated. The eventual solution would seem to be control of the whitefly and aphids which are responsible for the honeydew secretions on open cotton. The ICAC has sponsored a project by Egypt and Israel to develop novel formulations for insecticides and new spraying methods which has been financed by the Common Fund for Commodities in Amsterdam. The project which will begin this year has a projected life of four years.

Given the seriousness of the problem, textile mills are of course searching now for ways to deal with sticky cotton once it has been purchased. The Second ICAC Review Article, Stickiness in Cotton, concluded that solutions at the mill were not likely to be satisfactory, although care in processing through control of humidity and cleanliness of rollers, mixing with nonsticky cottons and treating sticky cotton with additives (either chemical or biological) were possible, though generally costly as well as only partially successful. Not buying sticky cotton or buying cotton from countries where stickiness has been present in the past only at a great discount to account for the risk of the cotton being sticky seems to be the primary defense of the textile mill today.

Short fiber content is also extremely important to spinners. A high content of fibers shorter than, say, one-half inch will result in more ends down (increased labor cost and lack of productivity), lower yarn strength and more yarn defects, plus the obvious loss from waste (nonspinnable fibers). Today the latest HVI classification machines can measure short fiber content, and it is likely that at some point buyers will want to base their purchases on short fiber content as well as other fiber characteristics. The Fourth Review Article on Cotton Production Research on Short Fiber Content, issued last year, noted that short fiber content has risen in many cottons of the world in the last thirty years, and has become a competitive problem for cotton in its battle with synthetics

In talking about the spinners' needs, I am reminded about the advice that the textile mill executive gave to the young farmer who inquired about the kind of cotton he would like to buy. The textile mill executive said cotton should be white as snow, strong as steel, fine as silk and cheap as hell.

This story is often told to emphasize the latter quality as the most important one. Textile mills it is said want fine qualities, but, most of all they want it cheap. Certainly there is truth here. No matter how poor the quality of cotton, at some price, it will sell and be used happily by the textile mill.

Let us look for few moments at what users are willing to pay for quality.

First, however, it is necessary to comment on what kinds of price information are available. For most countries of the world, cotton price information is available only by grade. In Central Asia, following the practice of the former USSR, cotton is sold as pervii (first), vtoroi (second), tretii (third) etc. to sixth. In Argentina it is sold by grades A to F, In Brazil from Types 1 to 6. In Egypt, India and Pakistan cotton is sold by variety. In China we have grades such as 129 indicating first quality 29 mm staple, 427, fourth quality 27 mm staple etc. Only in the USA is there an elaborate system of price reporting by quality including color, leaf or trash content, micronaire, strength, staple length and extraneous matter. However, this plethora of information is somewhat illusory.

When I first became intimately involved with cotton, I was astounded at the volumes of price data available. I soon found out that legislation passed in the 1920s in the USA required that a daily price be published by the USDA for all qualities of cotton in a number of regional markets, regardless of whether or not they were traded that day. Obviously, I had some concern about the validity of prices many of which were largely fictional as there is no day when all the possible combinations of cotton actually trade. I discovered that the system was one in which prices for a standard quality of cotton within markets were established based on the New York Cotton Futures settlement price for the nearby contract and differences established by a Committee which met from time to time. Cash transactions in the individual markets were used to establish the differences but not necessarily every day. Similarly, differences were established in individuals markets from the base quality, gauged by actual transactions. These differences remained in effect until changed by the Committee, which obviously did not examine every one of the 14,000 or more possible combinations each day.

Given the fact that prices published for individual qualities in the USA on any given day are unlikely to reflect actual transactions that day given the system, it is not surprising that researchers have found differences in actual premiums and discounts for quality and the stated premiums and discounts in the published price statistics. Economists at Texas Tech University have shown that, based on comparison with actual electronic market transactions in Texas and Oklahoma, producers receive higher premiums and steeper discounts for quality differentials than are reported. In the case of strength in West Texas in 1991/92, the actual premiums for 30 grams/tex

cotton were 150 points, as opposed to a reported premium of 50 points. In the case of trash, grade 21 (strict middling) received an actual premium of 500 points compared to a reported premium of 75 points in East Texas/Oklahoma.

What do the price statistics show for premiums for white as snow cotton? In Mississippi, the reported premium for bright or strict middling color (grades 11 or 21) is 25 points above the standard quality (3135). The same premium applies in West Texas and the San Joaquin Valley for better color than the standard qualities produced in these regions. If we take the results of the Texas Tech University studies as an indication that these reported premiums are understated, there might be from a quarter to three-quarters of a cent per pound achievable from producing whiter cotton. Given the yields in the USA, whiter cotton might mean at the most US$8 to $21 a hectare, depending on the region, or about nine-tenths of one percent of the cost of growing cotton on that hectare.

What about strong cotton? Current premiums for 30.5 grams/tex and higher strength cotton in the USA are reported at 25 points in most regions and 75 points in the San Joaquin Valley. If we assume that these reported premiums are only 1/3 the actual, in line with the Texas Tech discovery in the Texas market, the strongest cotton might mean as much as another US$8 a hectare to Texas growers or upwards from US$21 a hectare in California, depending on the extent to which the reported premium might be understated there.

It is difficult with current classification methods to measure cotton which is both mature and fine. If we assume that the 3.7-4.2 micronaire reading is the closest measure we can have, there is essentially no premium being offered in the Mid-South and Southeast USA for fine cotton. In Texas and California, a 25 point premium is offered. Again, if we assume that this premium is understated there might be another US$8 to $21 a hectare in it for the grower if his cotton meets what is generally considered the most desirable fineness for cottons used to produce medium and fine yarns.

What conclusions can we draw from this exercise? First, it seems that very little is being paid for quality fiber in the cotton market. Super color, strength and fineness will get you about US$24 a hectare. Reducing insecticide costs in Australia by 10% would get you US$40 a hectare, for comparison. Increasing yield by 4% would get you US$50.

Perhaps, the problem is that we are not measuring the right properties. Color, strength and fineness may not be as important as has been thought. Unfortunately, we do not have regular

measurements in use for neps, contaminants, stickiness and short fiber if these are the main concerns of the textile mills. The day is coming, however, when these kinds of measurements will be available through the HVI machine. Even though HVI technology has been in use for 20 years in the USA, it is probably just now that most US cotton is being marketed according to HVI properties. Other countries have moved more rapidly toward HVI, but perhaps have not had sufficient market impact.

Other speakers on today's program, Robert Baird from Queensland Cotton and Heather Ball from Rocklea Spinning will also be discussing quality concerns from the buyers' perspective. And after their presentations are made, I'm sure we will all agree that producing quality fiber is very important. The very future of cotton depends on it. The synthetic fiber producers have not given up; they are still trying to take cotton's market away with "unnatural" products which are uniform, predictable and easy to use.

However, if we are to make real progress in the production of quality cotton, we will have to have a system where producers and ginners are given incentives in the marketplace which will motivate them. A California ginner once told me, "I can produce any grade of cotton you want. Whether I produce a certain grade or not depends on its price. Is the premium enough to offset the loss in lint turnout or slower throughput that is involved to achieve it?"

Like the California ginner, I have every confidence that the world's cotton growers can produce the quality fiber desired by textile mills. But we must realize that quality has a cost which has to be compensated for in the market. Dr. Philip Cordiner, tonight's dinner speaker, has extensive experience in developing cooperation between agricultural and manufacturing industries essential for the common good. We are fortunate that he is in Australia at this time and able to share his insights regarding bringing buyers and sellers together with us.

In the long run, I think that HVI technology used and understood properly around the world still has the promise of leading producers and ginners to produce the fiber that the textile mills of the world want to buy to produce the products desired by consumers. But I am equally sure that only the qualities desirable enough to be paid for will be produced.