INTERNATIONAL TEXTILE MANUFACTURERS FEDERATION
FEDERATION INTERNATIONALE DES INDUSTRIES TEXTILES
INTERNATIONALE VEREINIGUNG DER TEXTILINDUSTRIE

Spinners Committee

Travel Report

Australia 2012

From April 30 to May 4, 2012 members of the ITMF Spinners Committee visited Australia as part of the on going program of the Committee to visit cotton-producing countries around the world in an effort to strengthen the dialogue in the cotton pipeline between growers, ginners, seed breeders and cotton spinners.

Participants

Committee Members & Secretariat

Andrew Macdonald	Brazil	Tavex Corporation (Chairman)
Steven Chen	Taiwan, China	Tah Tong Textile (Vice Chairman)
Werner Bieri	USA	Buhler Quality Yarns
Robert Galmes	Australia	Honorary Life Member
Christian Schindler	ITMF	Director General

Meetings and Visits

April 30, 2012

- Meeting with Mr. James Hill (Cotton Australia and cotton grower) and Mr. Phil Sloan (ACSA-Director and Cargill Cotton) in Griffith/New South Wales
- Visit of various cotton fields in the Griffith area
- Visit of a new saw-gin in construction

May 1, 2012

- Meeting with Mr. Bruce Finney (Executive Director) of Cotton Research & Development Center (CRDC) in Narrabri/New South Wales
- Meeting with Mr. Steve Ainsworth (General Manager) and Mr. Philip Steel (Product Development Manager) of Cotton Seed Distributors (CSD) in Wee Waa/New South Wales

May 2, 2012

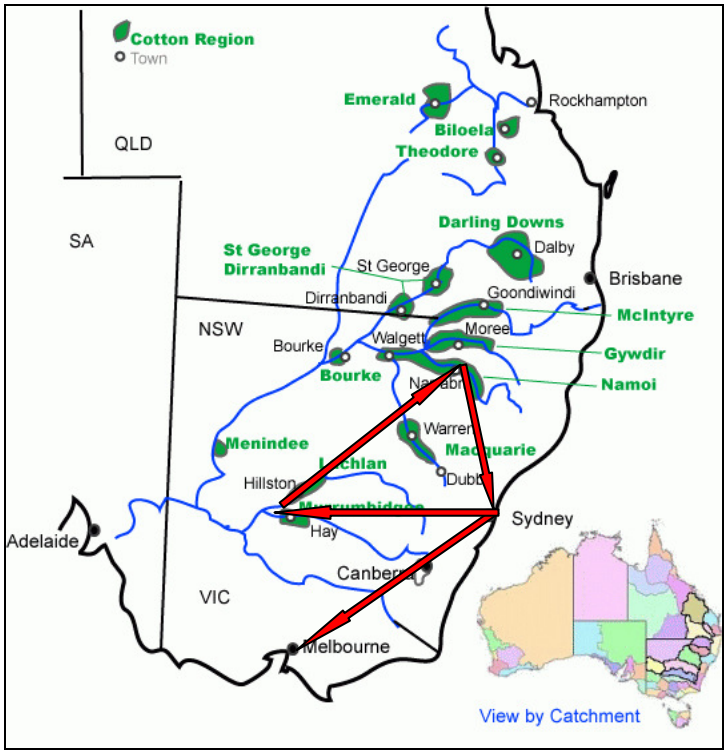
- Meeting with Dr. Greg Constable (Program Leader, Cotton Management & Improvement Stream Leader) and Dr. Warwick Stiller (Cotton Breeding Group Leader) of CSIRO-Plant Industry Division near Narrabri/New South Wales, CSIRO's Cotton Research Unit at the Australian Cotton Research Institute (ACRI)
- Visit of cotton fields in the region of Wee Waa/New South Wales
- Meeting with David Lindsay (ACSA Director and Namoi Cotton)
- Visit of a Namoi cotton gin in Wee Waa/New South Wales

May 3, 2012

- Meeting with Mr. Greg Parle (Auscott classing rooms) in Sydney
- Meeting with representatives of ACSA & Cotton Australia in Sydney

May 4, 2012

- Visit of the CSIRO Materials Science and Engineering Division in Belmont, Geelong, West of Melbourne/Victoria and meeting with Mr. Rene van der Sluijs (Textile Technologist and Project Leader), Mr. Stuart Gordon (Research Group Leader and Project Leader) and Mr. Geoff Naylor Principal Research Scientist), including a tour of the respective instillations of the textile department



Travel Route

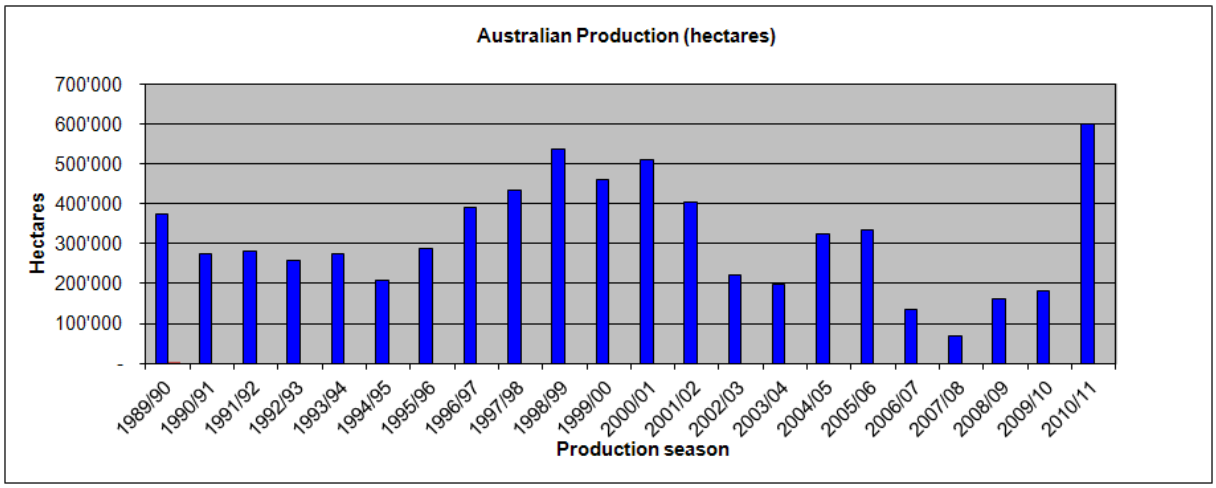
The Committee visited cotton fields, gins, seed producers, research institutes and met with representatives of the cotton industry and the cotton trade in Australia's provinces of New South Wales and Victoria.

The Committee met in Sydney/New South Wales (NSW) and then flew to the Griffith (NSW) where it had the opportunity to look at various cotton fields, to visit a new gin under construction and talk to cotton farmers from the Murrumbidgee region in the Southern part of NSW. From Griffith the Committee continued travelling via Sydney to Narrabri (NSW) in the region of the Namoi Valley, the Northern part of NSW, where the Committee had a meeting with the Cotton Research and Development Corporation (CRDC) followed by a meeting with the Cotton Seed Distributors (CSD) in Wee Waa (NSW) and a meeting with the Commonwealth Scientific and Industrial Research Organization (CSIRO), Plant Industry Division, in Narrabri (NSW). The Committee also visited a Namoi Cotton gin and had a look at some cotton fields in the area before returning to Sydney. In Sydney the Committee visited the classing room of Auscott and had a joint meeting with the Australian Cotton Shippers Association (ACSA) and Cotton Australia. The Committee representative flew from Sydney to Belmont, Geelong, West of Melbourne (Victoria) for a meeting with the Commonwealth Scientific and Industrial Research Organization (CSIRO), Materials Science and Engineering Division.

The Committee would like to express its appreciation for the warm welcome and the interesting discussions and exchange of opinions whenever it had the opportunity to visit fields, gins or research institutions. The hospitality of all hosts was outstanding and made the country visit not only very informative and educational but also very agreeable. The Committee would especially like to thank very much Ms. Tracey Byrne-Morrison of the Australian Cotton Shippers Association (ACSA) and Robert Galmes who organized the visit perfectly. The Committee would also like to thank the President of ACSA, Mr. George Gallacher, for allowing the association to dedicate time to the visit.

Australian Cotton Situation and Outlook

The last visit of the Spinners Committee to Australia took place in 1998. At the time the cotton area planted was close to 450,000 hectares producing an annual crop of approx. 3 million bales (= 681,000 tons). At that time around 70% of the cotton was grown in New South Wales with the remaining 30% in Queensland. 80% of the area under cotton was irrigated.

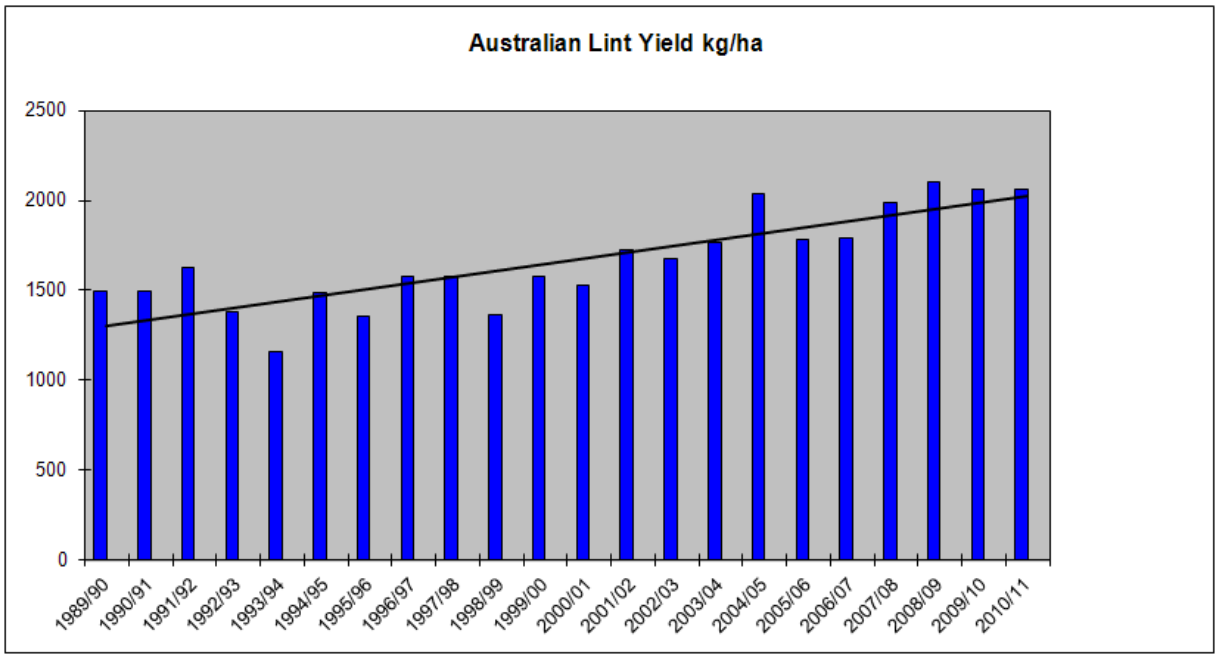


13 years later the cotton area planted in 2010/11 reached 600,000 hectares resulting in an annual crop of approx. 4 million bales (= 908,000 tons). Approx. 55% was produced in NSW and approx. 45% in QLD. There were recently some large scale trials in Kununurra in North Western Australia. Around 65% of the area under cotton was irrigated and around 35% on dryland. In 2011/12 approx. 120,000 hectares of dryland was under cotton, a share of approx. 20%.

Cotton production in Australia has been expanding constantly between 1989/90 when 1.3 million bales were produced until 2000/01 when cotton production reached 3.4 million bales. In the seasons 2001/02 and 2002/03 cotton output dropped to around 1.6 million bales as a result of a drought, but recovered in the following seasons when output reached between 2.6 and 2.9 million bales. The period between 2006 and 2010 was marked by a severe drought during which cotton production fell as low 600,000 bales in 2007/08. As a result of sufficient water cotton production surged from 1.6 million bales in 2009/10 to 4.0 million bales in 2010/11, an increase of +150%.

The general increase of cotton production was in line with the expansion of the area under cotton. In 1989/90 around 375,00 hectares were under cotton. This increased to 511,000 in the season 2000/01 but reached merely 68,500 hectares in 2007/08 but soared back to 600,000 in 2010/11. In 2011/12 the area under cotton is expected to be around 560,000 hectares. It is expected that around 500,000 bales will be lost as a result of the floods in the first few months of 2012.

The increase of cotton output was also the result of higher yields. In 1989/90 the average yield per hectare reached approx. 1,500 kg as compared to the record yields in 2008/09 when average yield amounted to approx. 2,100 kg. In 2010/11 the average yield was approx. 2,050 kg.



Until the season 2009/10 the average size of a cotton farm reached around 250 hectares but jumped to approx. 700 hectares in 2010/11 and reached 833 hectares in 2011/12. Of the 1,753 Australian cotton farms in 2011/12 the vast majority of the farms (1,355) have a crop size of less than 400 hectares. Approx. 50% of all farms are in the range between 50 and 200 hectares.

The shares of irrigated and dryland cotton varies of course with the amount of rains in each season. In 1989/90 the share of dryland cotton reached 50%, while this number dropped to mere 2% in 2002/03 in the middle of a long drought period. In 2010/11 and 2011/12 dryland cotton's share was 35% and 20%, respectively.

The growing season from planting to picking lasts approx. six months. The cotton planting period is between September and November. The cotton seeds are planted once the soil is warm enough (soil temperature 14 °C at a depth of 10 cm for at least 3 days).

The Australian cotton growers are using a wide range of measures to control pests. In addition to GM-cotton varieties cotton farmers use also natural and soft chemical options to protect the cotton from pests ("Integrated Pest Management" or IPM). Farmers are for example actively placing beneficial insects and predator pests in cotton fields in order to contain harmful pests.

Approx. 70% of the total crop is sold to China and 30% to other Far Eastern markets.

ITMF Spinners Committee Observations

On Cotton

Fields

During the field visit the Committee was impressed to see the very good set up of the cotton fields, the uniform plants as well as the excellent planting and irrigation techniques applied by the growers. Most irrigated cotton fields were either flatbed (91 cm width between rows) or mounds (100 cm width between rows). Only few variances could be observed between the different fields, which related mainly to soil differences, different planting periods or seed varieties.

Yields

With regard to yields the Committee noted that on average cotton lint output increased significantly between 1990 and 2012 from an average of around 1,500 kg per hectare to around 2,000 kg per hectare. This is one of the highest yields per hectare in the world and significantly above the global average of around 750 kg. In some areas the maximum yields per hectare can even reach 2,500-2,700 kg.

Genetically Modified Cotton (GM-cotton)

GM-cotton was introduced commercially in Australia in 1996 after six years of field trials. The insect-resistant GM cotton known as Ingard and as Bollgard, using a gene owned by Monsanto, contains two genes from the soil bacteria Bacillus thuringiensis (Bt), which allows the plant to produce a Bt protein which kills cotton's major pest, the Helicovera caterpillar or the cotton bollworm, when it ingests a small part of the cotton plant.

Today around 17 different cotton seed varieties are produced in Australia, of which 13 are GM-cotton seeds and four conventional seeds. Just two GM-cotton seed varieties of CSIRO (SICOT 71 BRF and SICOT 74 BRF) account for more than 90% of total seed production and sales.

In fact almost 100% of the total area under cotton in Australia is planted with herbicide and/or insect tolerant GM-cotton seeds; only a very small share is planted with conventional (non-GM) cotton seeds. The application of GM-cotton reduces the use of insecticides by 80% when compared to conventional cotton.

Overall the cotton industry uses three types of GM-cotton: Bollgard II (insecticide tolerant), Roundup Ready Flex (herbicide tolerant) and Liberty Link (herbicide tolerant).

In addition to the developments of insecticide and herbicide tolerant varieties also new cotton varieties have been released containing new features such as improved fibre qualities, disease resistance or maturity. Research is undertaken currently to develop varieties that require less water and/or are drought resistance.

The costs of seeds are around USD 400 per hectare. However, as an innovation an alternative it is being offered that the growers pay USD 50 per bale, which represents approx. 20% of total input costs per hectare (approx. USD 2,000), in order to link yields with the cost of seeds, thereby giving the growers more peace of mind.

Seed Breeding and Production

The main objective of the Australian cotton seed breeder (CSIRO) and producers (Cotton Seed Distributors Ltd. - CDS) is to provide a range of cotton seed varieties to the growers that are promising high yields, disease resistance, good fibre properties as well as water and nutrition efficiency. CDS has a licensing partnership with CSIRO to exploit cotton germplasm globally as well as licence agreements with Monsanto and BayerCropScience to develop and commercialise biotechnology traits in CSIRO varieties. Both GM-cotton seeds and conventional cotton seeds are produced by CDS.

In the discussion with the various research institutions it stood out that while yield is of course the main concern of the growers, the quality of the different fibre characteristics is playing an important role in the research activities. Even though there is a trade off between yield and better fibre characteristics (e.g. length, strength or micronaire), the researcher emphasized that the Australian cotton industry has to take into considerations the needs of the textile industry. The objective must be to reach a “sustainable competitive advantage”. The Committee welcomed the efforts to look also at the requirements of the textile industry from the spinning down to the finishing process as different fibre characteristics are important at different processing stages. A low short fibre index is invaluable in the spinning process; a good micronaire value (3.8-4.2) representing a fine mature cotton fibre is very important in the dyeing and finishing process. In this context the Committee understood that the researchers are very reluctant to lower the general micronaire value to the ideal levels as this increases the risk of too low micronaire values in cases of cool weather, late maturity, inappropriate defoliation, etc.

The cotton growers will benefit from a comprehensive approach that is looking to add value along the entire cotton textile value chain from fibre to retail. Overall a consistent supply of good fibre should be the main objective.

The Committee was impressed not only by the efforts to improve fibre characteristics, but to preserve them during the entire production stages, from the application of the best suitable seeds through harvesting to ginning. While today the focus in the cotton trade remains more on grade and staple and rather less on the other fibre characteristics, the Committee is of the opinion that this will have to change over a period of time, especially as the main consumers of cotton (China and India) will attach a greater importance to the other fibre properties in the effort to remain competitive with synthetic fibres.

The concepts of both Integrated Fibre Management (IFM) and Best Management Practice (BMP) play an important role and it was noted also that many innovations, including the new harvesting technologies, and seed varieties do not necessarily reduce input costs, but do improve the management of the farm as the grower has more time to apply these programs during the production cycle.

On Water

Water has always been a very important issue in Australia due to the variable climate with years of abundant supply of water and periods of droughts in other years. The long drought period in the second half of the last decade showed the importance of an efficient water management system which has led to further increasing the water-efficiency in the country. Already today Australia's cotton industry is considered as one of the most water-efficient in the world. According to Cotton Australia cotton's water use efficiency has doubled in the past 25 years and it is planned to double it in the next ten years.

It is important to note that cotton uses about the same amount of water as the other summer crops, is heat and drought tolerant, and uses less water than rice, maize or soybeans. The average irrigation requirement is around 5.6 megaliters per hectare. This compares to 13.0 megaliters for rice, 4.9 megaliters for fruits and nut trees or 4.8 megalitres for cut flowers and turf.

The cotton growers can only access water from rivers under strict government rules, when water is actually available. The majority of cotton farmers have what is called "low security" water licences, which means that they only have access to their water entitlements once the needs of towns, stock and domestic use and the environment are met. Depending on rainfall and the level of water reservoirs the share of water that is actually available to cotton growers can vary significantly.

Due to the limitation of water in agriculture the water is used efficiently on the highest value crop. With other words farmers will use their water entitlements on those crops that deliver the best return per unit of water. In the season 2011/12 when cotton prices were soaring to unprecedented levels, cotton was a very attractive cash crop leading to the largest crop ever.

It is interesting to note that the Australian cotton industry is investing in water use efficiency in many different areas from planting (e.g. zero or minimum tilting), irrigation methods (e.g. overhead lateral move sprinklers or drip irrigation), the selection of cotton seed varieties (e.g. Bollgard II has a shorter season and therefore requires less water), infrastructure (e.g. dams are built closer to the irrigation areas and water storage cells are smaller to reduce water evaporation), etc.

On Picking

In Australia cotton is harvested 100% mechanically, normally with conventional spindle pickers. Until a few years ago after harvesting the cotton was transferred to a cotton module builder, a machine that compresses harvested cotton into a large block, which is then covered with a tarp and temporarily stored at the edge of the field, before being transported still in module format to the gin.

In the past few seasons a new type of a cotton picker machine is beginning to revolutionise the harvesting process. The “round module picker” from John Deere forms round modules, using a mechanism similar to that of a round hay baler. The round modules are rapped with a polyethylene film, and when the automatic wrapping of the seed cotton is completed, the module is ejected onto the carrier at the rear of the machine from where it can be placed on the ground in a suitable place near the edge of the field without any down time, to stop and unload the traditional basket. It is estimated that in excess of 70% of this season’s crop will be harvested by round module pickers, up from only 40% in the 2010/11. The costs of a round module picker are approx. USD 750,000, thus considerably higher than the cost for a conventional picker (approx. USD 450,000) or stripper (approx. USD 150,000). While investment costs are significant, the resulting labour and efficiency savings are more than offsetting these expenses. The weight of a round module is around 2.5 tons as compared to around 14.0 tons of a conventional module.

The growers welcome the labour and efficiency savings as well as the cleanliness of the harvesting process. Labour involved in the harvesting process with round modules is approx. 5-6 times lower than with conventional modules. Nevertheless, there are also issues which could affect the quality of the cotton crop. Two of the issues observed are the moisture in the seed cotton and the danger of contamination from the wrap.

As far as the moisture in the seed cotton is concerned the new round module pickers enable growers to pick the seed cotton longer than traditionally. If picking is conducted during times of elevated moisture (e.g. in the morning or evening) there is the increased risk of fibre degradation (e.g. yellowing, spotting or fungal contamination). The last round module picked each night will have higher moisture content than those picked in the middle of the day.

The Committee also noted that round modules appear to influence the HVI results as the seed cotton is less mixed during harvesting with round modules in comparison to conventional modules. The cotton may vary in conditions in different areas of the field being harvested. Consequently the variances between round modules are higher when classing than in traditional modules. The Committee therefore recommends that exhaustive tests are undertaken to discover ways and means of mixing better the cotton from various round modules at the same time, when ginning, so as to ensure better uniformity for the spinning mills.

On Ginning

The Committee noted that 100% of the Australian raw cotton is saw-ginned. The Committee was impressed by the considerable investment in a new and very modern gin in Griffith, Southern NSW. This is indicating that the expansion of cotton production in Southern NSW is a long-term objective. This new gin is equipped with four stands (222 saws of 12 inch each per stand) and one press. Each stand is equipped with two lint cleaners. The capacity is expected to be 1,600-1,800 bales per day.

The Committee also visited a Namoi Cotton gin near Narrabri in Northern New South Wales with 4 stands (with 161 – 181 saws) and one press. The capacity is 55 bales an hour or approx. 1’300 bales a day. The gin had developed and produced its own opening system for round modules that prevents any of the plastic film to enter the ginning process.

The Committee learnt that the average gin turnout in Australia is approx. 40%.

The Committee noted that due to the large 2011/12 crop and the delayed harvest the gins are under enormous time pressure. Under such conditions the risk prevails that the ginning speed is set too high with negative effects to the fibre characteristics. The Committee pointed out that good ginning is essential for preserving the excellent characteristics of the Australian cotton fibres, which in the end will be important for receiving a premium for Australian cotton compared to other cotton suppliers.

On Ginning Technology

During the visit with CSIRO Materials Science and Engineering Division in Belmont, Geelong (Victoria) the Committee representative particularly stressed the view of the importance of improved ginning being now paramount to achieve further improvement and acceptance of Australian Cotton worldwide. The Committee learnt that Mr. Stuart Gordon had already undertaking considerable studies in this respect in an endeavour to engineer ways to reduce short fibre and the nep content, especially at the lint cleaner stage. However, it seems that manufactures were reluctant to include the modifications proposed by his studies. The Committee emphasised the view that these studies should urgently be re-presented and endorsed by the cotton industry. It even encouraged further studies so as to be able to produce a breakthrough in this technology, as current ginning was not keeping pace with textile machinery development, or with the technology being applied in growing and harvesting of the cotton.

On Testing Instruments

The extensive laboratories of CSIRO were visited, which cover not only standard cotton and wool testing equipment, but also fibre studies using high-powered microscopes. It was extremely impressive to see the extent of the “know how” and variety of instruments available for the department to test all aspects of testing from cotton to the final fabrics. The “Cottonscope” instrument was demonstrated for testing maturity and finesse presenting separate results, thereby improving on the traditional micronaire results that incorporate both of these aspects of the cotton in one reading. This instrument, now available commercially, will offer the textile industry much more accurate data as regards the cotton being spun, as well as predicable dye take up during the upstage processing. The Committee recommends a close investigation by all potential users into the utility of this new instrument in the spinning and dying process.

Also visited was the “spinning” area containing modern and older spinning technology, which allows the division to make tests on behalf of third parties as well as pure research. It was disappointing to notice the wool processing area totally shut down and “abandoned” due to lack of funds from this industry. This reminded the Committee of the importance of research centres actively involved in cotton, and that funds are made available for this activity.

The Committee fully endorses this philosophy in the cotton chain, and urges all concerned to ensure that work of this nature continues, if we are to maintain cotton as a main stream fibre and not allow it to disappear into a luxury fibre as has happened to wool.

On Fibre Quality

In general the fibre quality of the Australian cotton has improved considerably over the past decades. On average the fibres became longer and the average value of the micronaire came down closer to the preferred value range of 3.8-4.2.

On Contamination

The Committee observed that during the different stages of harvesting, processing into modules, transportation from field to the gin and ginning no major source of contamination could be observed. The fields are prepared mechanically leaving very little room for extraneous sources of contamination. Due to the reduced labour intensity by the adaption of round modules additional sources of contamination have been eliminated. The main potential danger of contamination stems from the wrapping material (polyethylene film) of the round modules. If not handled with care the wrapping material could find theoretically its way into the seed cotton when dropping on the ground (e.g. falling on stalks that are puncturing or tearing the plastic film), loading and unloading onto a truck or during unwrapping in the gin.

On Best Management Practices (BMP)

The Australian cotton industry introduced more than a decade ago an environmental program called Best Management Practices (BMP). myBMP is a web based program which replaced the original BMP version that was paper based. The objective of myBMP is to produce cotton in a sustainable way by improving farming methods (efficiency and productivity) while at the same time protecting the environment. It enables cotton growers and representatives to access technical data, information and research results to further improve the overall efficiency of the industry. myBMP helps growers to limit the use of pesticides and herbicides, control weeds and diseases, improve water use efficiency, etc. Cotton farmers are recorded, monitored and audited in the 11 key areas from biodiversity (avoidance, management and control of pests), and biotechnology (GM-cotton varieties) via fibre quality (growing best quality cotton) to pesticide management (pesticide storage and use) and water management (water quality, efficiency of storage and distribution as well as dryland and irrigated farming practices).

In 2010/2011 approx. 5,000 BMP-certified bales were sold. This number will jump to approx. 50,000 in 2011/12. While this is still a small proportion of the expected crop of around 3.5 million bales the Committee is very supportive of the BMP-concept as it helps to further improve the quality of the Australian cotton production by constantly applying best management practices, and which evidence shows are constantly improving.

Conclusions & Recommendations

The Australian cotton industry is one of the most productive and efficient industries in the world. It has a reputation for being free of contamination with very good fibre properties for which it receives a premium in the international cotton market.

In general the Committee was impressed by the overall research and development efforts conducted along the entire Australian cotton value chain in the area of seeds varieties via modern techniques and machinery in planting, irrigation, harvesting up to the ginning.

The Committee noted that GM-cotton has enabled Australian cotton growers to become more productive and efficient, constantly increasing yields per hectare since the introduction of GM-cotton in 1996. The research conducted on GM-cotton does not only focus on yield but also on fibre properties which are relevant for the textile industry. The Committee very much welcomes these efforts as improved fibre properties (e.g. length, strength, micronaire) will guarantee premium prices also in the future.

Also investments in new harvesting machinery (e.g. round module pickers) helped to reduce input costs for labour significantly, further reducing the risks of foreign contaminants stemming from the labour force entering the cotton. Nevertheless, the Committee also wants to point out that the plastic film wrappings of the round modules are potential sources for contamination which needs the attention of both the growers and ginners. Also as mentioned earlier further technology may be required to better mix the round bales at the ginning point to ensure the traditional uniformity of Australian cotton. The Committee was very pleased to see the expanded use of bale wrappings made of cotton-fabrics by the ginners

In the past few years enormous developments could have been observed in the area of seed developments and harvesting machinery. The Committee is of the opinion that the next big development should come from ginning. The necessity to better preserve the inherent properties of the fibres also during the ginning process is increasingly important, especially in light of the fact that research on fibre properties has intensified in the past few years. The Committee therefore endorses the research efforts undertaken by CSIRO and is encouraging manufacturers of ginning machinery to complement/support these efforts in order to provide the textile industry with better preserved cotton fibres.

The Committee was impressed to see the efforts by the Australian cotton industry to further strengthen the concept of Best Management Practices (BMP). In the opinion of the Committee Australia's BMP for cotton could serve as an example for other cotton producers where such concepts are not yet being pursued.

June 2012

Australian Cotton Production (incl. dryland) 1989/90 to 2010/11			
Year	**Total bales**	**Total ha**	**kg lint/ha**
1989/90	1,287,500	375,819	1,498
1990/91	1,804,000	274,200	1,493
1991/92	2,018,000	282,000	1,624
1992/93	1,559,860	257,220	1,377
1993/94	1,411,910	275,500	1,163
1994/95	1,365,140	208,300	1,488
1995/96	1,712,600	287,000	1,355
1996/97	2,710,800	389,500	1,580
1997/98	3,020,065	434,310	1,578
1998/99	3,221,340	535,400	1,366
1999/00	3,202,160	461,900	1,574
2000/01	3,441,334	511,077	1,529
2001/02	3,072,320	404,000	1,726
2002/03	1,630,100	220,500	1,678
2003/04	1,531,000	196,500	1,769
2004/05	2,904,000	323,450	2,038
2005/06	2,618,000	333,385	1,783
2006/07	1,199,700	134,290	1,793
2007/08	601,810	68,585	1,991
2008/09	1,494,300	161,390	2,102
2009/10	1,594,850	182,000	2,063
2010/11	3,999,600	599,630	2,063
2011/12 (* estimate)	4,700,000 *	*559,997*	-
Five year average to 10/11	**1,778,052**	**229,179**	**2,003**
Ten year average to 2010/11	**2,064,568**	**262,373**	**1,901**
Fifteen year average to 2010/11	**2,416,092**	**330,394**	**1,776**
Twenty year average to 2010/11	**2,215,444**	**313,297**	**1,682**