

The Role of Governments in the Cotton Industry: First, Do No Harm

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years, analyzing the U.S. cotton industry and editing a magazine devoted to a crosssection of agricultural issues.

Cotton is a great industry employing hundreds of millions around the world and providing products touched by almost every person on the planet every day. In any industry this large and important, governments will be involved in a multiplicity of ways, from approving seed varieties, to funding research, to regulating labour standards. Most of these interventions are both necessary and positive. We all realise that chemicals need to be regulated, that

workers need to be protected, that research must be funded, and that markets need to be transparent.

However, while governments always mean well, they do not always do well and some forms of government intervention have highly deleterious effects. The inefficiencies and harm associated with government measures that directly distort cotton production and trade have been well-discussed in ICAC meetings for decades. However, other forms of government involvement in global fibre markets have received less attention, even though their cumulative impacts may have great negative implications for the livelihoods of millions of people. In particular, government industrial policies that subsidise the production and use of synthetic fibers, and government agencies whose publications and programs disseminate falsehoods, or enable others to disseminate falsehoods, about cotton production practices, are doing great disserve to consumers and great harm to producers around the world.

Unity Needed

The world economy is highly and industries competitive, all face strategic threats. However, natural fibrers, more than most other agricultural commodities, face competition from manmade alternatives. The modern cotton industry based on international trade in saw ginned upland cotton is approximately 200 years old, and over most of that time governments could intervene in markets and critics could demonise the industry, secure in the knowledge that no matter how much harm they did, the world cotton

industry itself would recover. However, the loss of market share to polyester during the 21st century has been so rapid and so severe that cotton has reached a point where its survival as a major fibre is in question.

As of 2016, cotton appears to be an industry in decline, trapped between low prices for polyester and huge stocks of cotton, and under attack from government agencies that wish to limit cotton production because of perceived environmental and social harm. The governments of countries concerned about the health of the cotton economy must unite to confront these threats.



Dr. Terry Townsend

Polyester is a Product of Industrial Policy, not Market Forces

The underlying story about world cotton consumption can only be understood in the context of polyester production in China. As China started to industrialise in the early 1980s, textile production was a leading area of investment. In 1990, polyester fibre production in China was about 1 million tons, but by 2015, polyester production in China had grown to approximately 35 million tons, equal to 70% of the world total (PCI Fibers). The 35-fold increase in polyester production in China in 25 years is the single biggest factor reducing world demand for cotton today. (Dr. Dean Ethridge, Director, Fiber and Biopolymer Research Institute, Lubbock, Texas, USA, "Policy-Driven Causes for Cotton's Decreasing Market Share of Fibers.")



There are no comprehensive statistics on the number of polyester fibre production plants in China, their ownership, sources of financing or operating costs. However, the growth in polyester production in China has been so rapid, so enormous and so incongruous with investment patterns in other countries in Asia, that it is impossible to believe that industry expansion is a result of competitive, private sector investment.

The cost of construction of a polyester plant with a capacity of 250,000 tons per year is estimated at about US\$150 million. It has been widely reported that the national, provincial and local governments in China encourage industrial expansion through loans that are never repaid made by governmentowned banks. There are numerous stories in China of "ghost cities." (As one example: http://www. forbes.com/sites/kenrapoza/2015/07/20/whatwill-become-of-chinas-ghost-cities/#6acc81a7751b.) and industrial plants producing only for inventory because they have no customers. (Overcapacity In China's Industry 'Ever More Destructive' To Domestic And Global Economy: Report. http:// www.ibtimes.com/overcapacity-chinas-industryever-more-destructive-domestic-global-economyreport-2317045.)

Given the emphasis by all levels of government in China on textile production since 1990, it is highly likely that much of the expansion of polyester production capacity occurred with the help of loans that have become grants. It would be naïve to think that the expansion in polyester production in China occurred because Chinese consumers were demanding more polyester or that other market forces encouraged such growth. The expansion resulted from the industrial policies of the Government of China.

The loss of market share for cotton has been largely the result of policies of the Government of China following China's accession to the World Trade Organization (WTO) in 2001 and the end of the Multifiber Arrangement (MFA) in January 2005. Unless governments with an interest in the health of the world cotton industry unite in the WTO to oppose China's subsidisation of polyester production, in the same way that governments have waged a campaign in the WTO to reduce direct government measures that distort cotton production and trade, cotton's loss of market share will continue, and the livelihoods of cotton producers will be further compromised.

Technology Denial Strangles Cotton

The denial of agricultural technology by 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 must 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.





Group photo during the 1st members' meeting 2015 (far left: Ingeborg Neumann, Werner Lange, Dr. Uwe Mazura, Maik Pflaum, Nico Kemmler, Claudia Kersten, Bernd Hinzmann, Development Minister Dr. Gerd Müller, Dr. Bernhard Felmberg, Dr. Gisela Burckhardt, Frank Zach, Dr. Johannes Merck, Stefan Genth, Josef Sanktjohanser.) © Textilbündnis/T.Ecke

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. However, regulators and trade officials in many countries, and especially in Europe, often reject the science underlying modern agricultural production technologies.

The Partnership for Sustainable Textiles <https:// www.textilbuendnis.com/en/> is an initiative of the Federal Ministry for Economic Cooperation and Development, Government of Germany. The catalyst for the start of the Partnership was the collapse of a building called Rana Plaza in Bangladesh in 2013. The underlying premise of the Partnership is that deficiencies in the cotton, textile and garment value chain can be corrected by encouraging retailers in Germany to only source products made from cotton that is "sustainably" sourced.

Within the structure of the Partnership, a Working Group on Natural Fibres has developed a preliminary set of recommendations for adoption by the Partnership that would use moral suasion and public criticism to pressure German retailers to avoid sourcing consumer textile and apparel products made from cotton that is not produced under an identity program such as organic, Fair Trade, Cotton made in Africa or BCI. Cotton grown outside these programs, including almost all cotton produced in ICAC member countries, would face discrimination in international trade by retailers sourcing products for sale in Germany, and eventually the entire European Union.

If the Textiles Partnership were an entirely private sector activity, such actions would be outside the interest of governments, and it would be the responsibility of cotton producers to counter the claims made by those who would avoid purchasing their product. However, the Textiles Partnership is funded, organised and enabled by a government agency. Accordingly, this is a matter for government concern.

Under the preliminary recommendations developed by the Working Group on Natural Fibres, even cotton grown in Greece, Spain and Turkey (Turkey is a member of the EU customs union) would face discrimination in Germany. Even if the definition of "sustainable" cotton eventually adopted by the Textile Partnership is ultimately broadened to include cotton grown outside the identity programs, it will still communicate to consumers that only "certain cottons" should be allowed.

The danger of the Partnership for Sustainable Textiles is not that it will ever amount to anything, because it is so impractical it can never be implemented. The danger is that a government agency is lending its credibility to the demonisation of cotton, and this will hurt all producers.

Conclusions

Cotton and its sister natural fibres have long and romantic stories as some of the most important commodities in the history of mankind. However, just as horses have been supplanted by cars, so are natural fibres threatened by synthetic alternatives, particularly polyester. To survive as more than just a niche fiber displayed in museums and to remain commercially relevant, cotton must compete with polyester on both price and technical performance characteristics.

Among the major threats to cotton's long run viability as a commercial fibre are government policies that encourage polyester production and prevent cotton prices from being competitive with polyester, government policies and regulations that inhibit adoption of technology, and government programs that reinforce consumer attitudes born of ignorance that reject agricultural science.

To combat these threats, the cotton industry, and governments of countries with an interest in cotton, must unite and advocate for government policies that, "first, do no harm." Governments must oppose subsidies to polyester production just as vehemently as they have campaigned against subsidies in the cotton sector. Governments must also premise policies and programs on sound science to enable cotton producers to innovate, adopt and implement latest technologies that produce increased yields at lower costs to provide fibre to textile mills at prices competitive with polyester.

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

Production Of Man-Made Filament Yarn

(In Mn. kg.)

Month Viscose Filamer yarn		Polyester Filament yarn	Nylon Filament yarn	Poly propylene Filament yarn	Total		
2005-06	53.09	1075.82	36.84	13.58	1179.33		
2006-07	53.98	1270.83	32.25	13.41	1370.48		
2007-08	51.07	1420.14	27.62	10.51	1509.34		
2008-09	42.42	1332.09	28.07	15.08	1417.66		
2009-10	42.70	1434.88	30.35	14.79	1522.72		
2010-11	.0-11 40.92		33.46	13.14	1549.79		
2011-12	42.35	1379.52	27.95	13.19	1463.01		
2012-13	42.63	1288.15	22.91	17.18	1370.87		
2013-14	43.99	1212.43	24.09	12.91	1293.42		
2014-15	44.24	1158.20	32.55	12.77	1247.76		
2015-16	45.41	1068.80	37.26	12.66	1164.13		
2016-17 (P) (Apr-Sept)	23.38	524.26	20.15	5.79	573.58		
2015-16							
April	3.80	95.97	3.22	1.09	104.08		
May	3.70	96.03	3.01	0.99	103.73		
June	3.69	82.80	2.69	0.95	90.13		
July	3.78	82.67	3.11	1.12	90.68		
August	3.81	86.94	2.96	1.13	94.84		
September	3.82	89.67	2.81	1.00	97.30		
October	3.83	89.49	3.17	1.00	97.49		
November	3.75	87.58	2.86	1.32	95.51		
December	3.82	90.60	3.29	0.91	98.62		
January	3.83	93.31	93.31 3.36 1.02		101.52		
February 3.78		86.91	3.32	1.10	95.11		
March 3.80		86.83	3.46	1.03	95.12		
2016-17 (P)							
April	3.78	84.08	3.29	0.96	92.11		
May	3.88	85.31	3.38	0.96	93.53		
June	3.90	84.93	3.27	0.95	93.05		
July	3.98	89.83	3.46	0.99	98.26		
August	3.97	90.88	3.38	0.97	99.20		
September	3.87	89.23	3.37	0.96	97.43		

P - Provisional

Source : Office of the Textile Commissioner

New Directions in Cotton Research

(Contd. from Issue No.35)

Sukumar Saha

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The world population is projected to reach over nine billion people by 2050. The rapid increase in population demands that current production for global food and fiber security be almost doubled within the next three decades. Farmers will have to fulfill this demand under conditions of rapidly declining agricultural resources, including land and water under the pressure of weather volatility. The cotton producers are facing some serious challenges, including yield stagnation, loss of genetic diversity, and demands for superior fiber qualities due to changes in textile technologies and competition from synthetic fibers. We

have to find innovative solutions by integrating advanced technologies with conventional methods of agricultural practices to control pests, diseases and weeds and produce more stress-tolerant plants for sustainable cotton production. This paper highlights some important research areas focused on integrated approaches of novel biotechnologies, genomics and conventional breeding



methods for future sustainable cotton production.

Pest and Weed Control Research

The advanced technologies of genetic engineering to develop plants resistant to both insects and herbicides provided the maximum economic impact to cotton farmers since 1996 among all of the major crops. The future success of this technology will be based on the following specific strategies:

- Selecting the effective gene cassette composed of the most efficient promoter and genes of interest;
- Identifying the best event providing the best level of transgenic expression with desirable plant phenotype;
- Breeding the transgenic trait into elite cotton lines and developing a suitable management

practice to achieve the desired effect in the elite lines; and

 Documenting the safety of the technology through regulatory research program. Recent studies showed that the new emerging tool of RNAi technology to block the expression of specific genes would have great impact in transgenic research, such as improving seed or fiber qualities.

Genetically engineered herbicide-tolerant and insect-resistant cotton lines will provide significant economic benefits to growers and the environment. However, it is important to have a strong ongoing regulatory research program and a safety network against the development of resistant weeds or insects and to study the ecological impact of any new transgenic technologies to control weeds or pests. For example, Bt toxin will not have adequate

insecticidal effects on sap-sucking insects, such as aphids, whiteflies, plant hoppers, and other plant bugs. This may create a condition where many minor pests will evolve as the major pests in cotton fields. In addition, the overuse of a single product or herbicide to manage weeds may contribute in the selection for herbicide-resistant weeds in cotton fields. The future research on stacking multiple

resistant genes against a pest or weed through transgenic technologies in conjunction with an integrated insect and weed management strategy, such as herbicide or crop rotation or combination of both methods, and effective crop management system will be the critical factors in sustainable cotton production.

Next Generation Sequencing Technologies

The rapid development of the low cost next-generation sequencing technologies with the recent publication on decoding the cotton genome, such as A, D genome diploid species as well as AD tetraploid species of G. hirsutum and G. barbadense, have opened up a new paradigm in nearly all areas of basic and applied cotton research. These reference sequences provided a platform in conjunction with the rapid increase of functional genomic resources to collect valuable information on the association of phenotypes with functional genes for economically important fiber and biotic/abiotic resistance traits. Due to low cost and advancement in next generation sequencing technologies, soon RNA seq approaches will have ripple effects to open many new areas, such as large-scale study of the gene regulation, transcriptomes, proteomes and understanding the metabolic pathways to control economically important traits. The sequencing technology will help to understand the association of gene expression with differential epigenetic markings in the sub genome of the allopolyploid AD genome. Given the rapid innovations of cost effective sequencing technologies, an international collaborative effort to study and analyze genomewide sequence variation and its association with diverse phenotypes in a large number of cotton accessions will help, like Arabidopsis, to understand the molecular control of important traits in cotton. Such valuable information will be very useful to identify the precise target gene sequences for improvement of specific traits using new genome editing technologies, such as ZFNs, TALENs, and CRISPR/Cas. The genome editing will not only help in characterizing the potential functions of the genes but also will help create new varieties without introducing any foreign genes by manipulating the genetic code of the target genes. Perhaps such lines will be more acceptable to mitigate the unfavorable opinion against GMO in public forums.

Marker Technologies

With the continuous declining sequencing costs, it is expected that in the near future the next generation of molecular marker development effort will be based primarily on genotyping by sequencing. The development of sequence-based SNP marker strategy will play the major role in future molecular mapping of QTLs and marker-assisted selection programs. New technologies such as SNP chip consisting of high density SNP arrays, each containing ~63,000 Infinium assays (http://www.illumina.com/applications/agriculture /consortia.html) will be important tools in future molecular mapping research.

Conventional Breeding Methods

Future success in the genetic improvement of cotton will be dependent on an integrated approach of conventional breeding methods with new emerging technologies. Discounted prices for short-staplefibers with poor fiber qualities and yield will be the major concerns for cotton producers, so fiber quality and resistant traits against biotic and abiotic stresses will be key target points in cotton breeding programs. However, to maximize the economic benefits, cotton producers will be interested in improving some other novel traits such as seed qualities (e.g. gossypol-free cotton seed as an important source of protein or seeds with modified fatty acid composition). With rapid changes in climate as a result of global warming, high temperature stress will be a major factor in future cotton production. For example, heat stress could limit male and female gametophyte development or cotton fruit sets. Improving cotton cultivars with enhanced tolerance to limited moisture and heat stresses would be critical factors to mitigate yield losses with changing climate. The genetic diversity in the breeding gene pool of Upland cotton is narrow and considered to cause recent yield stagnation, decline of fiber qualities and increasing vulnerability to climate change. Wild tetraploid species are sanctuaries of many useful novel genes that remain unknown and underutilized in various cotton breeding programs. Interspecific germplasm introgression is normally constrained by genetic incompatibilities between the species. We have developed a series of chromosome substitution lines (CS) from G. barbadense, G. tomentosum and G. mustelinum in collaboration with Dr. David Stelly at Texas A&M University. Our results unveiled that CS lines will complement conventional breeding methods to unlock the gateway for discovery and targeted introgression of beneficial genes in future Upland cotton breeding programs.

Due to the globalization of agriculture, it is expected that commodity prices are likely to decline, and efficient agricultural management with superior traits in elite lines will be the key factors to combat future challenges. It is also important to note that cotton is a major cash crop in both developed and developing countries, where both environmental and economical impacts and the role of private industries and new technologies are very different in such complex agricultural systems. A coordinated global effort will have significant impact in future cotton research to provide maximum economic benefits against the primary challenge from synthetic fiber. The past records on the success story of cotton biotechnology demonstrated that a coordinated effort from private and public institute partnership at the global level would maintain the flow of scientific marvels providing maximum economic benefits to cotton stakeholders for sustainable production in the 21st century.

(To be Continued)

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COTTON EXCHANGE MARCHES AHEAD

Madhoo Pavaskar, Rama Pavaskar

Chapter 2 Improving Cotton Quality

(Continued from Issue No. 35)

Indian Standard Specifications

Instead, without any preparatory work and making available adequate resources for modernising the ginning and pressing industry, on December 31, 1987 the Union Ministry of Textiles amended the Cotton Control Order, 1986 issued under the Essential Commodities Act, 1955, and decided to adopt the Indian Standard Specifications drafted in April 1986 by the Indian Standards Institution. By the amended Order, every owner or lessee of a cotton ginning factory or a cotton pressing factory or a cotton ginning and pressing factory was required to pack cotton only as per the Indian Standard

Specification number 12171 for cotton bales as laid down by the Bureau of Indian Standards (formerly Indian Standards Institution). The Order came into force with immediate effect for cotton meant for export, but its enforcement for cotton sold for domestic consumption was set on September 1, 1988.

The ISS 12171 prescribed the requirements of ginned cotton in terms of trash content (varying from 3 per cent to 6 per cent for different categories/staple lengths of cotton) and moisture content (not to exceed 7.5 per cent in the pressed bale). It also specified such requirements as dimension (in terms of length, width and height at either 1060 x 530 x 780

mm or 1400 x 530 x 700 mm respectively), mass (i.e. weight at 170 kg \pm 5 kg for all months except from March to June when higher allowance of \pm 7 kg was permitted) and density (from 400 to 450 kg/m) for a full pressed bale. In addition, it laid down norms for full covering of bales with hessian, jute twine and iron hoops conforming to certain standards. The bales were required to be marked on one side using washable black ink indicating the name (type) of cotton, the press mark including month, year and place and the press running number.

Even before the amendment to the Cotton Control Order, in his Presidential address at the 65th Annual General Meeting of the East India Cotton Association held on June 8, 1987, Mr C.H. Mirani expressed the fear that "the ginning and pressing factories in the

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present state are not fit to comply with the proposed standards of the Bureau of Indian Standards (BIS), and hence they may have to be assisted financially with suitable incentives to make investments in order to modernise and update their factories". True, there was not much opposition to the application of the BIS standards for cotton exports, as exports were usually small in quantity and cotton bales meant for export were ginned and baled in a few modern ginning and pressing factories. But Mr. Mirani's fears were not unfounded with regard to cotton for domestic consumption, to which the standards were to become applicable from September 1, 1988.

Hue and Cry

Not unexpectedly, there was hue and cry from most ginning and pressing factory owners, especially in the northern region to the application of these standards for domestic consumption of cotton. Many small ginning and pressing units even brought down their shutters in early September 1988, affecting adversely forward purchases of cotton by merchants and mills to the detriment of farmers.

To be sure, most of the grievances of the factory owners were genuine. Thus, in the absence of standardisation of seed cotton, the prescription of limits on trash

content and moisture was tantamount to putting the cart before the horse. Similarly, in the absence of scientific storage facilities at the farm level, kapas arriving at the mandis was often soaked, and it was difficult for most ginners to reduce the moisture content to the permissible level. Even the dimensions for packing of bales were found to be impractical in many cases, as not all presses were of required volumes.

Aside from these difficulties which were beyond the control of the factory owners, most of the factories in the country lacked kapas and lint cleaners as well as conveyor systems required to reduce the trash content to the stipulated levels. Even the fabrication facilities to manufacture such machines were far from adequate. Most factory



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One Step Backward

The ginning and pressing factories were far from happy by mere postponement of the application of BIS standards to cotton for domestic consumption by just one year. To appease the aggrieved ginning and pressing community, BIS meanwhile proposed relaxation of certain standards by allowing higher trash content and implementation of these in a phased manner over a period of three years. But that too was of no avail. As the implementation of the BIS standards called for complete restructuring and renovating of the large number of age-old ginning and pressing factories, which was impossible to achieve without adequate financial and manpower resources and easy availability of requisite equipment, the factories urged the revocation of the said Order altogether for domestic consumption of cotton.

In view of the widespread seething discontent among the ginning and pressing factories, the Cotton Exchange decided to discuss this issue at a meeting of the representatives of all the upcountry cotton trade associations held under its auspices on March 31, 1989 at Surendranagar in Gujarat. While the general consensus at the meeting was in favour of the adoption of improved ginning and bale packing practices, the overwhelming view was that without adequate financial aid and other support measures to compensate ginners and pressers, it was not practical to comply with the BIS standards. It was therefore suggested that the standards should be made applicable on a voluntary basis and enforced statutorily only in a phased manner over a sufficiently long period.

Supporting this view, in a letter dated June 5, 1989 addressed to Mr. Abid Hussain, the then Member of the Planning Commission and Chairman of a Committee appointed by the Government of India to review the progress on implementation of the New Textile Policy announced in 1985, Mr. C.H. Mirani, the President of the East India Cotton Association (E.I.C.A.) at that time, was constrained to observe reluctantly, but pragmatically, that without modernization/renovation of the ginning and pressing factories in the country, it would not be possible to meet the BIS standards. It was clear that steps towards such modernization/renovation must precede the enforcement of any rigid ginning and pressing standards. The Cotton Exchange recognised that it was one step backward in its march towards improving cotton quality, but without any financial and infrastructural support forthcoming from the government, it had little choice.

At last, in deference to the wishes of the cotton trade and the ginning and pressing industry, and realising the intractable hurdles in the implementation of the BIS Standards, on December 15, 1989 the Union Ministry of Textiles decided to rescind the Cotton Control (Amendment) Order, 1987 for cotton bales packed for domestic consumption. It was a setback to the E.I.C.A.'s long efforts at improving the quality of Indian cotton, but was unavoidable in the then prevailing circumstances, considering the state of the ginning and pressing industry.

Scheme for Modernization

Although the Cotton Exchange was distressed by the outcome of this sad episode, it did not lose heart. It was convinced that instead of relying on statutory orders, the government should take positive and concrete steps for encouraging the ginning factories to modernise their plant and machinery. With this end in view, Mr. Mirani, the dynamic President that E.I.C.A. had for little over a decade from 1985 to 1996, proposed to the Secretary (Textiles) of the Government of India a novel scheme on May 31, 1990. The Scheme essentially aimed at creating a fund for modernising the ginning industry and establishing a suitable agency for systematic execution of the modernization programme.

It was proposed that a Fund be raised by levying a cess of Rs 10/- per bale on cotton consumed by the textile industry, since it would be the major beneficiary of improved and clean quality cotton. The proceeds of the Fund should be utilised for (a) disbursing finances to the ginning factories for modernization, a part of which would be in the form of subsidy and the balance recoverable in suitable instalments after 3 years' moratorium with a nominal rate of interest in the nature of service charge, say, at 3 to 4 per cent over a period of 10 to 15 years; (b) financing and conducting research in moderising ginning machinery, including press houses, through various research institutes; and (c) enforcing prescribed standards for ginning of kapas and packing of bales by the modernised units financed from the Fund.

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7986 7339 8	7339 8	œ	970	10208	10573	10067	10320	10742	10179	10432	10854	10770	10770	10911	10911	11023	11164	11360	14763
8127 7339 8	7339 8	8	970	10151	10461	10067	10264	10629	10179	10376	10742	10714	10714	10854	10854	10967	11107	11304	14763
8127 7339 8	7339 8	~	8970	10151	10461	10067	10264	10629	10179	10376	10742	10714	10714	10854	10854	10967	11107	11304	14763
8127 7339	7339		8970	10151	10545	10067	10264	10714	10179	10461	10826	10798	10798	10939	10939	11051	11192	11389	14819
8127 7424 9	7424	9,	9055	10236	10629	10151	10348	10798	10264	10545	10911	10882	10882	11023	11023	11135	11276	11473	14904
8183 7564	7564	•	9195	10376	10770	10292	10489	10939	10404	10686	11051	11023	11023	11051	11164	11164	11360	11557	14988
8183 7620 9	7620 9	0	1251	10432	10826	10348	10545	10995	10461	10742	11107	11079	11079	11107	11220	11220	11417	11614	14988
8183 7620 9	7620 9	5	251	10432	10826	10404	10601	10995	10517	10798	11107	11135	11107	11164	11248	11276	11473	11642	15044
8127 7592 9	7592	9.	9223	10404	10714	10404	10545	10882	10517	10742	10995	11079	11023	11107	11164	11220	11417	11585	15185
8070 7564	7564	•	9195	10376	10686	10348	10461	10854	10461	10657	10911	10967	10939	10995	11079	11135	11332	11557	15185
7874 7508	7508	•	9139	10320	10629	10264	10348	10798	10376	10545	10854	10854	10826	10882	10967	11023	11248	11473	15185
7874 7508	7508		9139	10320	10629	10264	10348	10798	10376	10545	10854	10854	10854	10882	10995	11023	11248	11473	15185
7874 7564	7564		9195	10348	10657	10292	10376	10826	10404	10573	10882	10882	10882	10911	11023	11051	11276	11501	15185
7874 7564	7564	• •	9195	10348	10657	10264	10348	10826	10376	10545	10882	10854	10826	10882	10967	11023	11248	11473	15185
7817 7592	7592		9223	10348	10714	10264	10376	10882	10376	10573	10939	10882	10882	10911	10995	11051	11248	11473	15185
7817 7592 9	7592 9	9,	9223	10404	10826	10264	10404	10995	10376	10629	11051	10826	10882	10911	10995	11051	11192	11417	15325
7845 7592	7592	- · ·	9223	10404	10798	10264	10404	10967	10376	10629	11023	10798	10854	10882	10967	11023	11164	11389	15325
8183 7620	7620		9251	10432	10826	10404	10601	10995	10517	10798	11107	11135	11107	11164	11248	11276	11473	11642	15325
7817 7255	7255		8886	9983	10264	9983	10236	10432	10095	10348	10545	10461	10461	10601	10601	10714	10854	11051	14622
8004 7428 9	7428 9	9	059	10214	10555	10158	10344	10724	10270	10506	10818	10755	10753	10846	10890	10968	11135	11339	14918
						1	$H = Hioh_{\mu}$	est I.	= Lowest	$A = A_7$	90DADC								

	UPCOUNTRY SPOT RATES (Rs./Qtl										ls./Qtl)	
Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]Spot Ra NOV							pot Rate NOVEN	e (Upcountry) 2016-17 Crop MBER – DECEMBER 2016				
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Strength /GPT	28th	29th	30th	1st	2nd	3rd
1	P/H/R	ICS-101	Fine	Below 22mm	5.0-7.0	15	7536 (26800)	7536 (26800)	7564 (26900)	7620 (27100)	7620 (27100)	7677 (27300)
2	P/H/R	ICS-201	Fine	Below 22mm	5.0-7.0	15	7817 (27800)	7817 (27800)	7845 (27900)	7902 (28100)	7902 (28100)	7958 (28300)
3	GUJ	ICS-102	Fine	22mm	4.0-6.0	20	7592 (27000)	7592 (27000)	7592 (27000)	7592 (27000)	7592 (27000)	7592 (27000)
4	KAR	ICS-103	Fine	23mm	4.0-5.5	21	9223 (32800)	9223 (32800)	9223 (32800)	9223 (32800)	9223 (32800)	9223 (32800)
5	M/M	ICS-104	Fine	24mm	4.0-5.0	23	10348 (36800)	10404 (37000)	10404 (37000)	10404 (37000)	10404 (37000)	10404 (37000)
6	P/H/R	ICS-202	Fine	26mm	3.5-4.9	26	10714 (38100)	10826 (38500)	10798 (38400)	10798 (38400)	10798 (38400)	10854 (38600)
7	M/M/A	ICS-105	Fine	26mm	3.0-3.4	25	10264 (36500)	10264 (36500)	10264 (36500)	10264 (36500)	10264 (36500)	10264 (36500)
8	M/M/A	ICS-105	Fine	26mm	3.5-4.9	25	10376 (36900)	10404 (37000)	10404 (37000)	10404 (37000)	10432 (37100)	10432 (37100)
9	P/H/R	ICS-105	Fine	27mm	3.5.4.9	26	10882 (38700)	10995 (39100)	10967 (39000)	10967 (39000)	10967 (39000)	11023 (39200)
10	M/M/A	ICS-105	Fine	27mm	3.0-3.4	26	10376 (36900)	10376 (36900)	10376 (36900)	10376 (36900)	10376 (36900)	10376 (36900)
11	M/M/A	ICS-105	Fine	27mm	3.5-4.9	26	10573 (37600)	10629 (37800)	10629 (37800)	10629 (37800)	10657 (37900)	10657 (37900)
12	P/H/R	ICS-105	Fine	28mm	3.5-4.9	27	10939 (38900)	11051 (39300)	11023 (39200)	11023 (39200)	11023 (39200)	11079 (39400)
13	M/M/A	ICS-105	Fine	28mm	3.5-4.9	27	10882 (38700)	10826 (38500)	10798 (38400)	10826 (38500)	10854 (38600)	10854 (38600)
14	GUJ	ICS-105	Fine	28mm	3.5-4.9	27	10882 (38700)	10882 (38700)	10854 (38600)	10882 (38700)	10911 (38800)	10911 (38800)
15	M/M/A/K	ICS-105	Fine	29mm	3.5-4.9	28	10911 (38800)	10911 (38800)	10882 (38700)	10911 (38800)	10967 (39000)	10967 (39000)
16	GUJ	ICS-105	Fine	29mm	3.5-4.9	28	10995 (39100)	10995 (39100)	10967 (39000)	10995 (39100)	11023 (39200)	11023 (39200)
17	M/M/A/K	ICS-105	Fine	30mm	3.5-4.9	29	11051 (39300)	11051 (39300)	11023 (39200)	11051 (39300)	11079 (39400)	11079 (39400)
18	M/M/A/K/T/O	ICS-105	Fine	31mm	3.5-4.9	30	11248 (40000)	11192 (39800)	11164 (39700)	11192 (39800)	11220 (39900)	11220 (39900)
19	A/K/T/O	ICS-106	Fine	32mm	3.5-4.9	31	11473 (40800)	11417 (40600)	11389 (40500)	11417 (40600)	11445 (40700)	11445 (40700)
20	M(P)/K/T	ICS-107	Fine	34mm	3.0-3.8	33	15185 (54000)	15325 (54500)	15325 (54500)	15325 (54500)	15325 (54500)	15325 (54500)

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