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Natural Fibres and the World Economy

EXPERT's Column

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Dr. Terry Townsend

World natural fibre production in 2012 is estimated at 34 million tons, including 27 million tons of cotton, 3.5 million tons of jute, and 1.1 million tons each of clean wool and coir. Production of all other natural fibres, including flax, hemp, kapok, ramie, sisal and other fibres summed to approximately 1.5 million tons in 2012.

The farm value of natural fibre production in 2012 reached approximately US$60 billion, of which cotton accounted for $44 billion, wool $13 billion and jute $2 billion. All other natural fibres together accounted for the balance of about $1 billion.

It is difficult to estimate employment in the agricultural segments of natural fibre value chains because most production occurs in developing countries with weak systems of data collection, most producers are small holders and most labour is hired informally and seasonally, and because many households go in and out of fibre production from one season to the next making it difficult to know who and how many are employed in any one year. Nevertheless, a reasonable estimate of total employment in natural fibre industries, including family labour, hired labour and employment in industries providing services to agriculture, and including both full time year round employment and part time or seasonal employment is between 300 and 400 million.

Cotton

Cotton is by far the more significant of the natural fibre industries in terms of production, value and employment.

Cotton is grown commercially in about 80 countries on approximately 2.5% of the world's arable land, making is one of the most significant of all cash crops. Cotton is also a highly-traded commodity with about 150 countries involved in exports or imports of lint. Cotton connects people to markets because it is storable, durable, has a high ratio of value to cost of transportation and because it can be grown in arid regions. Therefore, cotton is grown in land locked countries and interior regions of continents.

An estimated 40 million or so households are involved in cotton production around the world each season, and including seasonal labor an estimated 250 million people are employed in cotton production during some parts of each season. By far, the largest number of people involved in cotton is in China, where an estimated 30 million households are cotton producers. The average farm size in Eastern China is only about one-tenth of one hectare. Another 9 million households are involved in cotton production in the Indian subcontinent, and about 3.5 million African households are producing cotton each season. All other cotton producing regions together, including Central Asia, the Middle East, Australia, Europe, South America and North America account for less than one million households together.

Wool

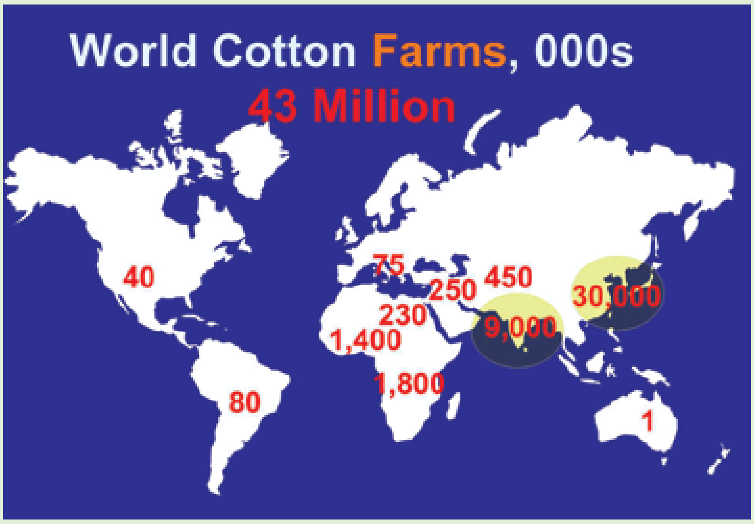
Global wool production has been declining since the early 1990s and was 1.1 million tons, clean basis,in 2012.Apparel accounts for 60% of wool use. Australia is the leading producer of wool, which is mostly from Merino sheep. New Zealand is the second-largest producer of wool, and the largest producer of crossbred wool, and China is the third-largest producer. Breeds such as Lincoln, Romney, Drysdale, and Elliotdale produce coarser fibres and wool from these sheep is usually used for making carpets (International Wool Textile Organization, IWTO).

The value of world wool production in 2012 was about $13 billion, using the Australian market indicator as a proxy for the average farm price of wool around the world. The average price of wool per kilogram in 2012 was 7 times the average farm price of cotton, reflecting higher costs of production per kilogram for wool.

Jute and Kenaf

Jute and kenaf are cultivated almost exclusively in developing countries of East Asia and in some parts of Latin America. Bangladesh, India and Thailand account for over 90 per cent of world production. Jute is processed mainly in the producing countries themselves and is used for the manufacturing of traditional products such as hessian cloth, food grade bags, carpet backing and other floor covering. Diversified jute products, such as geo-textiles and composites are manufactured in relatively small quantities. Jute cultivation and processing is labour-intensive and therefore provides a livelihood and an important source of food security for many farmers and their families in Asia (Food and Agriculture Organization of the United Nations, FAO, http://www.fao.org/docrep/006/y5143e/y5143e1g.htm).

Until the late 1990s, world production of jute fluctuated between 3 million and 3.7 million tons, with the notable exception of a record crop of over 6.0 million tons in 1985. Between 1998 and 2000, world production exhibited a marked decline to an average level of 2.6 million tons because of competition with polypropylene. However, world jute production in 2012 had recovered to 3.5 million tons, and the farm value of production was about $2 billion. The farm value of jute per kilogram is only one-fourth the value of cotton, reflecting the relatively low intensity of uses of jute.



Silk

World silk production amounts to less than 200,000 tons of filament, but with an average farm value of more than $4 per kilogram the total value is about $700 million. (There are enormous differences in prices of silk in different countries reported by FAO, from 44 cents per kilogram in Tajikistan to $16 per kilogram in Azerbaijan. Such differences can't reflect market conditions and must occur in the data because of differences in definition or errors in reporting. China is the largest producer, and producer prices from China for silkworm cocoons are used here.)

In the ancient era, silk from China was the most lucrative and sought-after luxury item traded across the Eurasian continent, and many civilizations, such as the ancient Persians, benefited economically from trade (Wikipedia).India is the second largest producer of silk in the world after China. About 97% of the raw silk comes from five Indian states, namely, Andhra Pradesh, Karnataka, Jammu and Kashmir, Tamil Nadu and West Bengal. Silk is produced year round in Thailand. Most production is after the rice harvest in the southern and northeastern parts of the country.

Other Fibres

World production of flax, used to make linen, ramie, which is often blended with cotton in apparel

fabrics, and sisal, an industrial fibre, totaled about 600,000 tons with a farm value of about $600 million in 2012.

No reliable world price indicators are available for coir (fibres from the husks of coconut), industrial hemp, kapok and other animal fibres besides silk and wook, such as camel.. These other fibres amounted to nearly 2 million tons of production. Assuming an average farm value equal to that of jute, these fibres would have been worth about $800 million in 2012.

World Fibre Production

World Fibre Production (in tons)

	2008	2009	2010	2011	2012, pre			2012 price US$/kg (farm value)	2012 Value $Billion
Natural Fibres									
Vegetable Origin									
Bastfibres, other	344,590	296,154	239,824	275,762	272,363		**	0.45	0.1
Coir	1,059,110	1,101,445	1,112,200	1,093,320	1,093,320		**	0.45	0.5
Cotton lint	23,585,105	22,334,413	25,409,485	28,040,589	26,828,569			1.65	44.2
Fibre crops not specified elsewhere	276,231	243,426	244,055	266,160	265,097		**	0.45	0.1
Flax fibre and tow	527,851	320,891	243,555	226,727	243,115			0.65	0.2
Hemp tow waste	60,440	48,079	46,919	52,331	53,495		**	0.45	0.0
Jute	2,691,315	3,045,089	2,828,533	3,583,156	3,461,964			0.45	1.6
Kapok fibre	97,034	98,540	99,000	99,000	99,000		**	0.45	0.0
Ramie	255,204	215,665	193,875	163,228	154,435			1.52	0.2
Sisal	192,000	177,000	195,000	172,000	180,000			1.30	0.2
Animal Origin									
Silk raw	164,385	163,941	164,781	161,201	161,661			4.44	0.7
Wool, clean	1,188,646	1,104,229	1,126,803	1,117,446	1,110,673			11.59	12.9
Other, greasy weight*	50,966	49,523	48,948	49,917	50,990		**	0.45	0.0
Total Natural Fibres	30,492,877	29,198,395	31,952,978	35,300,837	33,974,682				60.8
Manmade Fibres									
Cellulosic Fibres	3,568,400	3,937,800	4,381,600	4,697,800	5,362,200				
Synthetic Filament	23,525,900	24,664,800	29,046,000	30,974,500	33,475,700				
Synthetic Staple	15,197,670	15,701,780	16,523,580	17,202,060	17,969,670				
Total Manmade Fibres	42,291,970	44,304,380	49,951,180	52,874,360	56,807,570				
Total Fibre Production	72,784,847	73,502,775	81,904,158	88,175,197	90,782,252				

Sources for fibre production:
Cotton: International Cotton Advisory Committee
Sisal: London Sisal Association
All Other Natural Fibres, Vegetable Origin: Food and Agriculture Organization of the United Nations
Silk: Food and Agriculture Organization of the United Nations
Wool: International Wool Textile Organization
All Other Natural Fibres, Animal Origin: Various sources as reported by the International Wool Textile Organization
** (Includes: Alpaca, Angora Rabbit, Camelhair, Cashmere, Guanaco, Llama, Mohair, Vicuna, Yakhair)*
Manmade Fibres: The Fibre Year GmbH, Switzerland
Sources for fibre prices:
Cotton: Cotlook A Index less 15% to account for gin-market costs
Flax, Ramie, Sisal and Silk: FAO
Jute: International Jute Study Group
Wool: Australian Market Indicator
*** No data on average farm value are available; farm prices are assumed equal to jute.*

Contamination, Trash and Moisture Control in Ginning & Pressing Factories

GUEST COLUMN

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Shri M. K. Sharma is the President of Bajaj Steel Industries Ltd.(1961) Nagpur. He is a Post Graduate with over 34 years of managerial experience and is a Director on the board of several companies in India and abroad. He has held various positions in trade associations like FICCI, Vidarbha Industries Association, Regional Advisory Council Central Excise, etc. Besides presenting papers on Cotton Processing Technologies in various forums including International Cotton Advisory Committee (ICAC) Washington, USA, he has co-authored a book on "Double Roller Ginning Technology". Instrumental in developing modern systems and machines for cotton ginning and pressing factories, he has also organised several awareness programs in collaboration with CIRCOT.

The contamination, trash and moisture contents of cotton and their effects have always been a matter of great concern for cotton users. Despite centuries of research and volumes of written work, there has been no effective control on contamination trash and moisture. Several questions still remains to be answered, some of which are:

1. When all the contributing factors of contamination have been identified and efforts are being taken to reduce the same, why is the contamination in cotton increasing?

2. Will it be viable in the long term for spinning mills to make huge investments for removal of contamination at various levels such as at blow room by contamination sorters, vision shield or manual sorting, at carding and comber by cotton contamination analyzer, at draw frames and lappers by BMS vision Sliver Watch System, at winding by using electronic contamination clearing channels or UV lights, etc.?

3. Is hand-picking and related practices responsible for increased contamination and trash in cotton?

4. Whether the addition of extra moisture in seed cotton is beneficial and why the practice of addition of moisture even above 15% is increasing day by day?

5. Whether the spinning mills should pay higher for cotton having lower contamination, trash and moisture contents or they should handle the same in their premises only?

It is becoming imperative to analyze the reasons for contamination in cotton and finding out whether the present scenario of contamination, trash and moisture in cotton will be sustainable in the long run.

Contamination:

As per International Trade Centre, "broadly extraneous contamination in cotton bales can be classified in to two groups: Fibrous and Non-fibrous contaminants".

Fibrous contaminants include:

a) Human hair

b) Animal hair

c) Yarn pieces

d) Cloth pieces

e) Polypropylene fibres or strings

f) Jute, ramie, hemp

g) Plastic strings

h) Long bark and weeds

i) Bird feathers

All these contaminants disintegrate into tiny pieces in the process of ginning and carding. They have almost the same buoyancy as cotton, so it is difficult to separate them from cotton. As they are fibrous, they are easily twisted into the yarn body. Thus, fibrous contaminants are the worst component among extraneous contaminants. No chemical process can remove polypropylene and hair contaminants from yarn and fabrics. It is expensive to extract these contaminants from woven cloth, and they cannot be easily removed from knitted fabrics or garments as there is danger of causing holes.

Non-fibrous contaminants include:

a) Paper, mint wrappers

b) Cables

c) Cartons

d) Wood

e) Stones

f) Metallic wires

g) Nuts and bolts, nails

h) Parts from ginning machines

i) Rubber

j) Leather

k) Tin

l) Insects

Apart from the above, oil and grease are also serious contaminants. The above are somewhat easier to remove in the spinning process. However, they can cause damage to machine parts.

The quantity or weight of extraneous contaminants ranges from 2 to 100 grams per ton depending on the origin. Fibrous contaminants form about 65%–90% of total extraneous contaminants.

The quantity of contamination per ton of raw cotton seems very small in terms of weight. However, contamination is counted in cloth by frequency, not by the weight of the contaminants. One gram of fibrous contamination in a ton means 0.001% by weight, but this may equate to about 15,000 individual fibres (assuming an average length of 2 cm and denier of 10.0 for these fibrous contaminants)! The lighter the fibrous contamination, the greater is the number and hence higher the defects in the fabric.

As per the press release of Summary of Survey Results 2013 by International Textile Manufacturers' Federation (ITMF), the level of cottons moderately or seriously contaminated as perceived by the spinning mills from around the world rose from 23% to 26% as compared to the last survey in 2011.

The most contaminated cotton descriptions considered for the survey originated in India, Zambia, Pakistan, Tajikistan, Uzbekistan and China. In contrast, very clean raw cottons were produced in USA, Spain, Australia, Brazil, Togo and Benin.

From the fibrous and non-fibrous contaminants mentioned above, except for human hair and one or two other types, none of the others can be directly attributed to handling by humans. Since the contaminants are surveyed at cotton lint level only, it is difficult to calculate the contamination levels for handpicked or machine picked seed cotton when it arrives in the ginning factory. Amongst the countries which have clean cotton, one common similarity has been observed - that most of them use pre and post cleaning and modern ginning machinery; while in the higher contamination countries, proper cleaning machinery is not used in cotton ginning and pressing factories.

In countries where seed cotton is machine-picked, the initial trash and contamination are much higher as compared to hand-picked cotton due to contaminants being getting mixed in the modules. However in those cases, the final contamination level is lower when ginned in proper cleaning machines, while the hand-picked clean cotton has higher trash and contamination due to poor cleaning setup.

We assume that because cotton is a natural fibre, it is bound to have some contamination. But contaminants do not grow on the tree, but are added during picking, storage, etc. Removal / control of the same is certainly possible if the proper cleaning methods are followed.

Ideally, it is best to control the contamination at its origin, by educating the large number of people involved in picking, handling and storage of seed cotton and control the contamination levels at origin. But since this is a very long term process; the next best thing is to take necessary action to remove the trash and contamination at cotton ginning and pressing factories. This is certainly a control point and the easiest and most cost effective, as contaminants are easily removable prior to their fibrillation in the ginning process. In fact, it is most cost effective and least time consuming if these contaminants are removed at the pre-cleaning level, by simply removing trapped contaminants from spiked pre-cleaners. The spiked pre-cleaners can be stopped for a minute after every one hour or so and the contaminants trapped on the spike can be removed manually. Frequently cleaning the spike may enable removal of majority of contaminants at this level itself, finally resulting in much lower contamination levels in the cotton bales. However, a majority of the ginning factories are unwilling to follow this method for various reasons, some of which are listed below:

i. When purchasing cotton, the spinning mills do not consider contamination as a parameter.

Only length, micronaire, moisture content and trash content are considered. Even RD value and short fibre contents are not discussed at this stage, therefore the ginner is least bothered about the level of contamination and RD value, etc.

ii. Though initial trash in countries where cotton is hand-picked is lower than 2% in majority of varieties and initial moisture is lower than 6%, as against normally permitted higher level of trash and moisture by the spinning mills such as 4-5% trash contents and 8-9% moisture contents that are considered acceptable by Indian spinning mills; traders and ginners are tempted to add moisture and resultant trash to add to the weight to get the highest margin up to the acceptable levels of trash and moisture by the mills. In this process of adding trash and moisture, the contaminants are also considered as weight and no efforts are made by most ginners to remove them as that would decrease the weight of the cotton.

iii. Purchasers of cotton appointed by spinning mills think that the contamination will be removed through spinning processes such as blow room, carding, winding, etc. Hence they do not give due weightage to this aspect despite the fact that the cleaning of contaminants is the costliest process in the spinning mills and none of the machines used for removing the contaminants can remove all the contaminants.

iv. Since the spinning mills do not consider contamination as a parameter for purchasing cotton and the accepted levels of trash and moisture are on the higher side, the ginner too do not take up this issue with the traders or farmers strongly. They also adopt a casual approach to contamination, finally resulting in higher contamination.

v. In the USA, the United States Agricultural Department (USDA) takes samples of each bale of cotton and publishes quality data based on which cotton is traded. This regulatory control enforces the best ginning practices and results in lower contamination cotton. In the absence of such regulatory setup in several other countries, ginners do not give due importance to proper cleaning.

There are several other factors which discourage control or removal of trash or contamination mainly in ginning and pressing factories where hand-picked cotton is ginned and lesser number of cleaning machineries are installed; as against a higher number of cleaning machineries in the ginning and pressing factories where machine-picked cotton is ginned. In the process of cleaning, trash and some contaminants get removed hence the machine-picked cotton is found with lower trash and contamination. If proper cleaning is used for the hand-picked cotton in ginning and pressing factories, the same will certainly have the lower contamination and lower trash with the advantage of better fibre parameters, but this is only possible when the ginner are encouraged to remove the trash and contaminants and not to add excess water.

Though it is well known to the spinners that contamination - even if it is a single foreign fibre - can lead to downgrading of yarn, fabric, garments or even the total rejection of an entire batch and can cause irreparable harm to the relationship between growers, ginners, merchants, textile mills and consumer, sufficient importance is not given to the issue of contamination while purchasing cotton..

A study conducted in Pakistan estimates that contamination of cotton is responsible for an annual loss of US$1.4 billion to US$3 billion in export earnings and while a study conducted in Indonesia shows that the cost of manual cleaning for sorting contamination alone is estimated at 3.1 to 4.4 US cents per kg.of lint depending upon the level of contamination.

Trash:

This commonly comprises of leaves, bark, grass, sticks, particles of sand and dust and these items are normally removable from seed cotton and lint by using different cleaning equipments such as inclined cleaners, horizontal cleaners, stick removal machine, impact cleaners, lint cleaners, etc. The number and type of cleaning machines will depend upon the quantity of trash present in the seed cotton, however it is a pre-condition that the trash can be effectively removed only when the moisture content in the cotton is within the recommended parameters of below 8% and the ginning factories are using cleaners to remove the trash. Usually, when the trash contents are within the permissible percentage, ginners tend not to use the cleaning machines as they lose money due to weight loss and in the absence of proportionate premium for lower trash contents in cotton they are unwilling to do so. Moreover, when the moisture contents are higher and ginners do not use the dryers, it becomes difficult to remove trash from cotton. The non removal of trash at origin at most of the ginning factories incurs losses at later stages due to unnecessary transportation cost and higher cost of removal at spinning mills.

Moisture:

The recommended moisture contents in cotton is 7-8% for proper cleaning, better fibre parameters and ease of ginning in the ginning factories. The addition of moisture up to 11% in seed cotton may give better fibre parameters and ease of ginning, but it is certainly not good for removal of trash and contamination. Hence at the ginning level, the moisture content should be added only upto 8% before cleaning if the incoming moisture content is lower. However a large number of ginners in different countries prefer to have higher moisture content to add to the weight, which finally results in higher trash and contamination as the cleaning effect is not proper. Thus it is essential to control this practice either by commercial or regulatory methods.

Combined Effect of Higher Moisture Content, Trash and Contamination:

Cotton is under constant threat from artificial fibres and the presence of contamination is one of its main weaknesses. If this is not controlled at the origin or at the most at cotton ginning and pressing factories, it will have a very serious impact on the whole cotton industry in the long run. It will be costlier for spinners to invest in expensive electronic equipments while still running a high risk in spinning cottons and its blends due to rejections and defects, hence the spinning of artificial fibre

and its blends may be preferred. Thus all the stake holders, especially spinning mills who are the most affected, must take necessary steps to control this situation. Spinning mills should create conditions where ginners are compelled to remove trash and contamination by using cleaning equipment and methods and produce clean cotton as per acceptable parameters. Higher moisture contents lead to non removal / addition of trash and contamination and hence must be controlled. All efforts should be made to ensure that contamination levels are controlled below 1 gram of fibrous contaminants per ton of raw cotton bales.

Suggestions to Control the Situation:

1. The majority of ginners in various countries are not motivated to use adequate cleaning equipment and control the moisture contents as they are not getting proportionate premium from the spinning mills. For instance, against the accepted trash level of 5% and moisture content of 8%, when ginner supplies cotton with 2% trash content, he should get 3% premium for lower trash. Hence for a bale of cotton costing say about US$ 350, the ginners should get an extra US$ 10.5 for each bale for lower trash and not only consolation increase of US$3 per bale. Similarly, if the trash contents are below 1 gram of fibrous contamination per ton of raw cotton, at least 25% of the saving in the cost of cleaning of contaminants at spinning mill should be paid to ginners for clean cotton, so that they are encouraged to clean the cotton.

2. Alternatively, the initial pricing parameters should be fixed at the best trash contents such as at 1% so that initial price is higher and if the ginner sells the cotton with 4% trash, 3% deduction should be made. As the mills may prefer making the deductions rather than paying proportionate premium, an inadequate premium does not solve the problem. The variety wise price being fixed, this may just have the consideration for lowest trash percentage and best contamination levels and fix the corresponding higher price. This will certainly be beneficial to spinning mills in the real sense as they will get better realisation and reduced cost of cleaning and challenge the ginners to bring down the trash and contamination contents to the lowest.

3. In case spinning mills are not able to control market mechanism and introduce additional parameters, they should themselves go for backward integration and establish their own ginning and pressing factories for their needs and maintain best quality parameters to get the quality cotton for their spinning needs.

4. All the countries should introduce American USDA type arrangements for taking appropriate sample from each bale of cotton and publish quality parameters based on which prices and trading should take place.

5. Government guidelines should be published for best ginning practices and acceptable cotton parameters and mechanism should be devised for implementing the same.

Conclusion:

If proper drying and cleaning practices are used in cotton ginning and pressing factories, the contamination, trash and moisture levels can be brought down to acceptable levels. However there is urgent need to adopt either commercial or regulatory methods or other similar methods to encourage / implement the best ginning practices to achieve this, which in turn will result in lower contamination and trash in cotton and lead to sustainability of the cotton as preferred fibre for spinning in the long run.

Courtesy: Cotton India 2014

Production of fibres

(In Mn. Kg)

As on	Raw Cotton (Oct.-Sept.)	Synthetic			Cellulosic	Sub Total
		PSF	ASF	PPSF	VSF	
2000-01	2380	566.42	99.43	2.26	236.17	904.28
2001-02	2686	551.42	94.84	2.38	185.28	833.92
2002-03	2312	582.13	105.27	2.46	224.61	914.47
2003-04	3043	612.58	117.00	2.74	221.01	953.33
2004-05	4131	644.16	127.61	2.88	247.95	1022.60
2005-06	4097	628.15	107.81	3.08	228.98	968.02
2006-07	4760	791.99	97.13	3.52	246.83	1139.47
2007-08	5219	879.61	81.23	3.43	279.90	1244.17
2008-09	4930	750.12	79.50	3.44	232.75	1065.81
2009-10	5185	872.13	90.45	3.38	302.09	1268.05
2010-11	5763	896.33	79.48	3.74	305.10	1284.65
2011-12	5899	829.74	77.71	4.08	322.64	1234.17
2012-13	--	848.05	73.59	4.26	337.49	1263.39
2013-14 (P)	--	845.95	96.12	3.71	361.02	1306.80
2014-15 (P)						
April	--	70.24	8.52	0.38	29.91	109.05
May	--	70.79	7.48	0.36	31.30	109.93
June	--	70.62	8.32	0.36	28.62	107.92
July	--	81.56	6.26	0.33	30.72	118.87
August	--	74.63	8.67	0.36	30.68	114.34
September	--	68.45	7.82	0.40	30.14	106.81
October	--	72.14	8.35	0.36	31.16	112.01

(P)= Provisional

Source : Office of the Textile Commissioner

UPCOUNTRY SPOT RATES

(Rs./Qtl)

Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]							Spot Rate (Upcountry) 2014-15 Crop DECEMBER 2014					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Strength /GPT	22nd	23rd	24th	25th	26th	27th
1	P/H/R	ICS-101	Fine	Below 22mm	5.0-7.0	15	9055 (32200)	9055 (32200)	9055 (32200)		9055 (32200)	9055 (32200)
2	P/H/R	ICS-201	Fine	Below 22mm	5.0-7.0	15	9195 (32700)	9195 (32700)	9195 (32700)	H	9195 (32700)	9195 (32700)
3	GUJ	ICS-102	Fine	22mm	4.0-6.0	20	7452 (26500)	7536 (26800)	7536 (26800)		7536 (26800)	7536 (26800)
4	KAR	ICS-103	Fine	23mm	4.0-5.5	21	8014 (28500)	8099 (28800)	8099 (28800)	O	8099 (28800)	8099 (28800)
5	M/M	ICS-104	Fine	24mm	4.0-5.0	23	8802 (31300)	8858 (31500)	8858 (31500)		8858 (31500)	8858 (31500)
6	P/H/R	ICS-202	Fine	26mm	3.5-4.9	26	8886 (31600)	8970 (31900)	8998 (32000)		8998 (32000)	9055 (32200)
7	M/M/A	ICS-105	Fine	26mm	3.0-3.4	25	7986 (28400)	8070 (28700)	8070 (28700)	L	8070 (28700)	8070 (28700)
8	M/M/A	ICS-105	Fine	26mm	3.5-4.9	25	8211 (29200)	8295 (29500)	8295 (29500)		8295 (29500)	8295 (29500)
9	P/H/R	ICS-105	Fine	27mm	3.5.4.9	26	8970 (31900)	9055 (32200)	9083 (32300)	I	9083 (32300)	9167 (32600)
10	M/M/A	ICS-105	Fine	27mm	3.0-3.4	26	8127 (28900)	8267 (29400)	8267 (29400)		8267 (29400)	8267 (29400)
11	M/M/A	ICS-105	Fine	27mm	3.5-4.9	26	8633 (30700)	8633 (30700)	8633 (30700)		8633 (30700)	8633 (30700)
12	P/H/R	ICS-105	Fine	28mm	3.5-4.9	27	9167 (32600)	9251 (32900)	9280 (33000)	D	9280 (33000)	9336 (33200)
13	M/M/A	ICS-105	Fine	28mm	3.5-4.9	27	9195 (32700)	9195 (32700)	9195 (32700)		9195 (32700)	9195 (32700)
14	GUJ	ICS-105	Fine	28mm	3.5-4.9	27	9139 (32500)	9139 (32500)	9139 (32500)	A	9139 (32500)	9139 (32500)
15	M/M/A/K	ICS-105	Fine	29mm	3.5-4.9	28	9392 (33400)	9392 (33400)	9392 (33400)		9392 (33400)	9392 (33400)
16	GUJ	ICS-105	Fine	29mm	3.5-4.9	28	9336 (33200)	9336 (33200)	9336 (33200)		9336 (33200)	9336 (33200)
17	M/M/A/K	ICS-105	Fine	30mm	3.5-4.9	29	9448 (33600)	9476 (33700)	9476 (33700)	Y	9476 (33700)	9476 (33700)
18	M/M/A/K/T/O	ICS-105	Fine	31mm	3.5-4.9	30	9617 (34200)	9645 (34300)	9645 (34300)		9645 (34300)	9645 (34300)
19	A/K/T/O	ICS-106	Fine	32mm	3.5-4.9	31	9870 (35100)	9954 (35400)	9954 (35400)		9954 (35400)	9954 (35400)
20	M(P)/K/T	ICS-107	Fine	34mm	3.0-3.8	33	12429 (44200)	12513 (44500)	12513 (44500)		12513 (44500)	12513 (44500)

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