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Unlearn A Few And Learn Some New

(Part-II)

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"In great attempts it is glorious to fall" –Cassius

EXPERT's Column

Dr. K.R. Kranthi

Should India aim for better times, many concepts will have to change for the better. I firmly believe that we shall enjoy the myriad galaxies only if we aim to reach for the stars. The moon could be just an easy destination en-route.

The Prime Minister of India gave a clarion call on 28th February 2016 at Bareilly, to double farmers' income. The average cotton farmers' income in India during 2008 to 2013 was Rs. 12,619 per hectare, according to the CACP (Commission for Agricultural Costs & Prices), Ministry of Agriculture -Government of India. However, the net income is considered to be closer to Rs. 30,000 per hectare if fixed costs (value, revenues, rents & taxes of land, implements, machinery, infrastructure etc.,) were deducted from the cost of cultivation. Therefore doubling the income would mean to enhance the net profit to Rs. 60,000 per hectare. Can this happen by 2022? A simple calculation shows that if yields can be doubled to 3000 kg seed-cotton per hectare, the gross income becomes Rs. 150,000 per hectare. With operational costs at Rs. 60,000 per hectare (10% higher than current levels), the net income actually increases about 3-fold to Rs. 90,000 per hectare. However, to double farmers' income, the productivity needs to be raised by 40% to 700 kg/ha while ensuring that there is only a marginal increase in the operational costs.

Can Indian yields be doubled to 3000 kg seed-cotton, equivalent to 1000 kg lint per hectare? The textile commissioner Dr. Kavita Gupta dreams of a yield target of more than 2500 kg lint per hectare in India by 2022. She believes that if Australia could do it now, India certainly can do it in the near immediate future. It is this belief that should inspire cotton scientists, corporate sector, administrators and farmers in India to work together towards the goal in right earnest. We may or may not reach 2500 kg/ha by 2022, but with sincere efforts to reach the goal, obtaining 1000 kg/ha, should be a cake-walk.

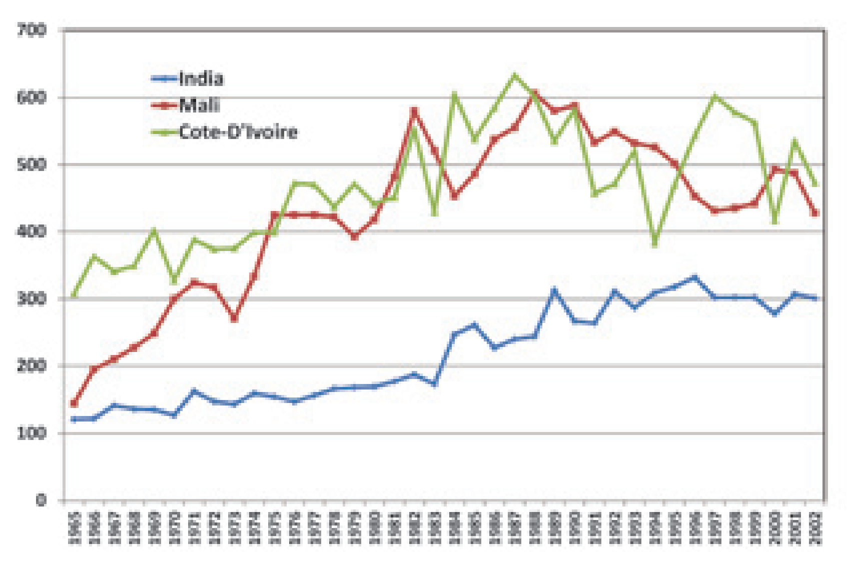
Doubling of income can happen either by increasing yields or by reducing production costs or both, provided that the market demand remains sustainable. Appropriate technologies and strategies are needed either to increase yields or reduce production costs. Currently, India has access to all the cotton technologies and agri-ingredients that are available to all other advanced countries, including Australia, Brazil, USA and China, etc. More than 90% of the 10 to 13 million hectares in India are saturated with Bollgard-II Bt-hybrids. However, yields at an average of 500 kg lint per hectare were stagnant for more than a decade and are now on a declining trend despite the access to all the latest technological advances. Currently, there is no prospective promising technology in sight from the private or corporate sector, either in the form of GM (genetically modified) or otherwise, that has the potential to trigger a change towards yield enhancement. Therefore, there is an imminent need to seriously introspect and explore ideas of all kinds including 'out-of-the-box' concepts, eventually to develop roadmaps to establish alternative cotton production systems to usher in a new sustainable era of high yields from low production costs. The proposed alternatives must be robust enough to inspire confidence in farmers for a change.

Do we have the technologies available with us to double India's average yields to 3000 kg seed cotton per hectare, or do we have to explore new options? Indeed some farmers in India get yields of 3000 to 4000 kg seed-cotton per hectare with the existing technologies of early sown hybrids or varieties cultivated in deep black-cotton soils grown for about 210-240 days under drip irrigation, plastic mulching and high levels of fertigation. But as Dr. Ramesh Chand, member, Niti-ayog, Government of India, succinctly says that these are 'islands of prosperity in oceans of poverty'. Most of these high-yield farms are based on high input management and cannot be replicated in the fields of small farmers, especially those having marginal soils under rain-fed conditions. Therefore, there is a need to explore those technological options that can be most relevant to the vast majority of farmers who cultivate cotton on marginal soils with low inputs, especially in rain dependent conditions that constitute 60% of India's cotton acreage.

Something to Learn from the Curious Case of Mali and Cote D'Ivoire

Interestingly, there are simple technologies that are followed in poor countries of Africa wherein yields of about 1500 kg seed-cotton per hectare were obtained consistently for several decades. Mali and Cote D'Ivoire are two such examples, where for 30 years after 1975, the average lint yields were 489 and 505 kg lint per hectare respectively, which was equivalent to double the Indian cotton yields, during the corresponding period. Mali harvested 425 to 606 kg lint per hectare at an average from about 1.5 to 5.0 lakh hectares with negligible inputs, under rain-fed conditions with hardly any technologies such as hybrids or Bt or drip-irrigation etc. Climate and rainfall in Mali are almost similar to Vidarbha. Cotton is completely rain dependent. Like in Vidarbha, sowing happens in June-July and harvest in November-December. The problems of bollworms, thrips and whiteflies in Mali are as acute as they are in India. India's average cotton yields during the corresponding 30 years from 1975 to 2004 were half that of Mali and Cote D'Ivoire (Figure 1). Compared to India's cotton travails, I would rate the cotton journey in these two countries as nothing short of a fairy-tale, given the logistic difficulties in Africa. It is interesting that Mali has been cultivating only two to three varieties called STAM 59A, NTA93-15 and NTA 90-5. Plant density is three to four times higher than India. Ginning % is more than 42%. The crop duration is about 150 to 160 days. Farmers know the risks, problems and prospects of the varieties under variable conditions, thus

Figure 1. Cotton lint yields Kg/ha in India, Mali and Cote D'Ivoire



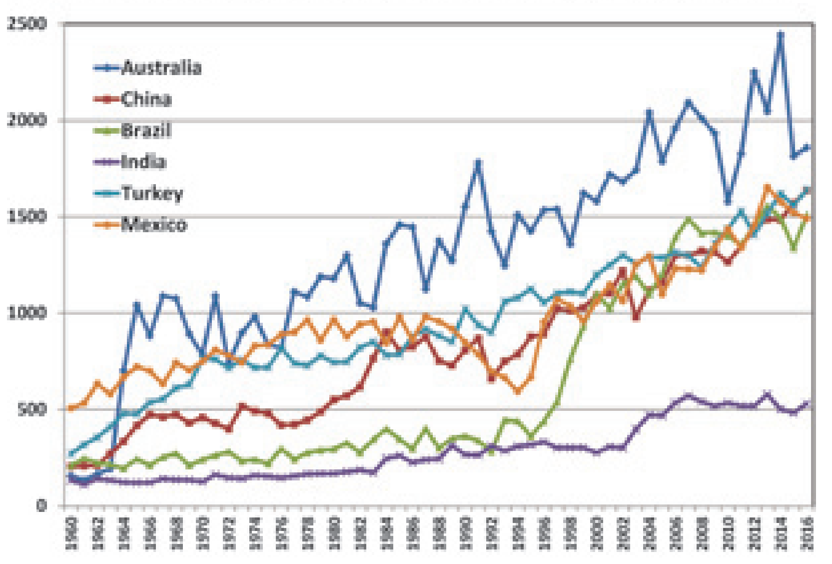
making management easier using simple, time tested strategies. Could these simple factors have been the main secrets of their success? Can these practices be adapted easily in India?

Lessons from the Enigmatic Yield Curve in the 'Magnificent Five' Countries

As mentioned in part-I of this article, five major cotton countries, China, Australia, Brazil, Mexico and Turkey have been able to achieve National average yields of more than 1500 kg lint per hectare (Figure 2), which is three times more than India's average. Can we identify a few key technologies or strategies of these countries that could be adapted in India? Though a few common simple factors are striking across these countries, the growth curve is enigmatic since it is difficult to pin-point the exact factors that may have spearheaded the growth curve. One thing that is clearly acknowledged by these countries is that consistent scientific efforts resulted in technologies that sustained the growth curve. Plant breeders worked hard to develop 'compact-statured', 'short duration' 'synchronous early-maturing' varieties that are suitable for machine picking and high density planting, which appear to have mainly triggered the yield enhancement. These varieties have premium quality fibre, high harvest index (yield v/s biomass), high ginning% (lint % of seed-cotton), high initial vigour and high nutrient-use-efficiency. High density planting with 7-12 cm between plants in a row is a common practice. Row to row spacing depends on whether the crop is irrigated or rain-dependent. Nitrogen fixing legume crops are commonly used in crop rotation generally in double cropping systems. Legume crops and broad leaf creepers are planted as inter-crops or cover-crops for pulses, oilseeds, green manure, nitrogen fixation and management of weeds and soil moisture. Cover crops and crop residue management are considered important for soil enrichment in all the six countries. Crop residue mulching or plastic mulching is done extensively for management of soil moisture and weeds. Canopy management is followed scrupulously by using chemicals or manual intervention to restrict plant height to less than 100 cm and width to 60-70 cm by removing unproductive branches and leaves. Management of plant architecture was reported to result in high yields by channelising nutrients efficiently into developing bolls thereby preventing nutrient wastage. Drip irrigation, fertigation and plastic mulching are followed widely in China. Water and nutrient usage is optimised based on soil or plant analysis. Pesticide usage is mostly restricted to a bare minimum based on principles of integrated pest management (IPM).

Many of the global best practices have evolved over several years of hard work carried out by scientists of the respective countries. These practices were mostly tailor-made for the local adaptable conditions. Obviously, the best practices in a country would depend on the local climate, varietal adaptability, seasonal water availability, soil type and nutrient status, major insect pests and diseases and market demand. It is possible that many of the practices may or may not be suitable for other countries. However, the basic principles of 'best practices' are oriented towards ecology, environment and sustainability. These practices can be validated for local situations in India.

Figure 2. Cotton lint yields Kg/ha in Australia, China, Brazil, India, Turkey and Mexico



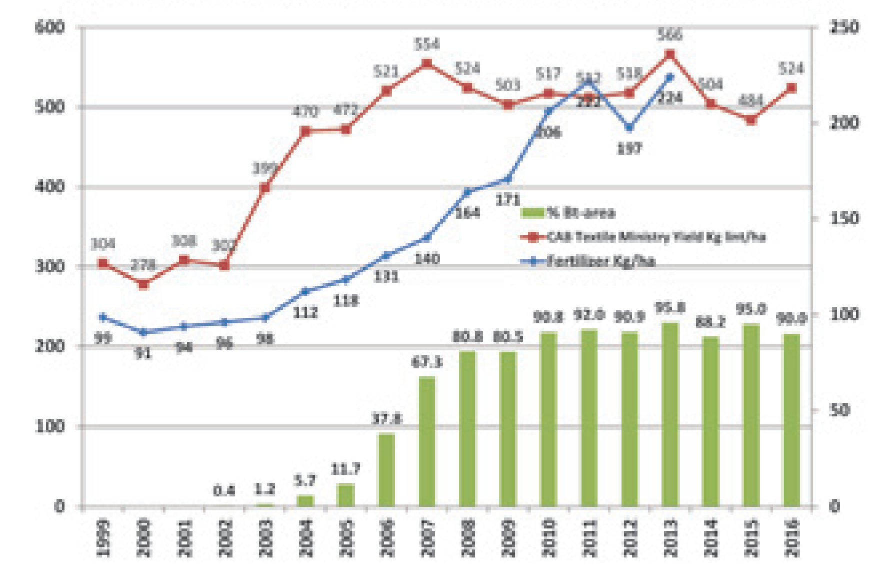
Technologies seldom deliver results independent of the environment in which they are expected to perform. One or two ideas picked up from the global best practices may or may not blend into the matrix of practices followed in other countries. Therefore to harness the full potential of the new practices, it would be extremely important to examine the interactive effects of the introduced practices with the extant technological environment prevalent in the country. For new practices to be harmonised with the existing system, it may be necessary to shed a few old practices that are incompatible with the new ones.

The Need to Introspect, Identify Dogmatic Ideas and Unlearn Them

As mentioned in Part-I of this article, in stark contrast to other countries, Indian hybrid cotton is characterised by an inordinately long duration of 210-240 days due to which pest management, nutrient management, soil moisture management and crop management get fairly complicated. We need to change this. The low stagnant National average yields over the past 10 years (Figure 3), despite the country being saturated with long duration Bollgard-II (BG-II) hybrids should prompt us to unlearn the dogmatic ideas that 'hybrids give high yields' and that 'long duration cotton tides over risks and gives higher yields'. Further, India needs to accept the fact that the country's cotton will not see a break-through as long as we do not realise that the existing scenario is actually bad when placed in a global perspective and is only likely to get worse if proper steps are not initiated in time. There is a constant propaganda that 'all is well', that 'Indian cotton is shining', that the production has doubled due to the all-pervasive new hybrid-technology and that from being a net-importer, India became the world's second largest exporter of raw-cotton – and all this happened due to Bt-technology alone. Nothing would be said to highlight that the production could have increased because of the 50% increase in India's cotton acreage, increased irrigation and other technological advances. There wouldn't be any mention on the stagnant yields after 2006 despite doubling of Bt area, doubled fertilizer usage, doubled pesticide usage and tripled cost of production. In my view the country's cotton scenario is grappling with the handicap of misinformation and ambiguity. There are several unanswered questions. If we do not ponder on these questions, if we do not accept ground-realities and bitter facts and if we convince ourselves blindly by the commercial propaganda that 'all is well', it is quite likely that we will never know what to unlearn and learn. A few issues that need to be examined critically are listed below in the form of questions.

1. Why is it, that India's 10-year average yields of 500 kg/ha are almost half compared to the average yield of 'rest of the world' comprising of 80 countries?
2. Despite being saturated with Bt-technology coupled with hybrid technology, why were India's yields less than the yields of 32 cotton growing countries? 25 of these countries neither grow hybrids nor have access to the GM Bt-technology.
3. What caused the significant increase in yield during 2002 to 2005 when the growth in Bt-area was very low from 1.2% in 2003 to 14.2% in 2005?
4. Why were the yields stagnant, despite the spectacular increase in 'Bt-hybrid area' from 37% to 95% in five years after 2006?
5. Why didn't the yields increase after 2006 despite Bollgard-II technology or the 734 Bollgard-II hybrids that were released in a short span of 4 years after 2006?
6. Why did the insecticide use in India double up after 2006?
7. Why did the fertilizer usage double up within five years after 2006?

Figure 3. Cotton lint yields Kg/ha, % Bt-cotton area and fertilizer usage Kg/ha in India



8. Why did the pink bollworm develop resistance to Bollgard-II only in India just in 4-5 years and not in any other country even after 16 years of exposure to Bt cotton?

9. Bt-technology effectively controlled bollworms. But, were all yield gains due to Bt-technology alone? Is there any clear evidence of any significant infestation of American bollworm on cotton after 2002 which would have caused losses otherwise in the absence of Bt-technology? The American bollworm was known to be primarily induced by the indiscriminate use of synthetic prethroids. Pyrethroid usage declined significantly on cotton in India after 2004 and so did the infestation of the American bollworm.

10. What was the contribution of hybrid technology alone and prolonged crop duration of long duration hybrids to yield enhancement after 2006?

The above issues are related basically to the hybrid-technology that invariably leads to low plant density which results in bushy tall plants with excessive unproductive bio-mass and long duration that covers almost two cropping seasons. The long duration crop in India has a long critical window of 'flowering and fruiting' that has a long extended vulnerability to insect pests, diseases, water stress and nutrient stress thereby warranting a nightmarish crop management characterised by uncontrolled, faulty and indiscriminate applications of fertilizers and pesticides. Indian cotton scenario is thus characterised by indiscriminate fertilizer usage, imbalanced nutrition, nutrient wastage, excessive pests, indiscriminate repeated pesticide usage; pest resistance to pesticides, crop stress, low yields and high cost of cultivation.

The New Lessons

Alternative cotton production systems for sustainable high yields at low production costs can be modelled by incorporating the best global practices into the existing Indian production systems. From the list of 'best global practices' that triggered high yields across the globe, a few that are either completely new or are partially new to India are listed below, which need to be considered seriously if the country has to convert its dream into reality. These practices could be adopted for doubling farmers' income using Bt-hybrids or Bt-varieties or non-Bt varieties or Desi-cotton varieties.

The Five Varietal Traits: Short duration (140-160 days); compact architecture; high harvest index and resistance to sap-sucking pests and high ginning% (>40%).

The Five Steps in Planting: Stale seed-bed; nursery raised seedlings or treated seeds; planting in north-South row orientation; precision high-density planting at 10cm plant-to-plant spacing and planting on ridges

The Five Production Practices: Cotton-legume based cropping systems as cover-crop / inter-crop or crop-rotation; mulching with plastic sheets or crop residues or newspapers; conservation agricultural practices and minimum tillage; water harvesting & precision irrigation and application of organic manures, compost & precision fertilizer application based on soil or plant analysis.

The Five Management Interventions: Canopy management; square & boll retention management; green manure crop and incorporation; ecological engineering, integrated pest management (IPM) and insect resistance management (IRM) for pest, disease and weed management and timely termination and crop residue management.

Conclusion

How is the yield increased and production cost reduced? New short duration varieties with high nutrient use efficiency combined with canopy management, nutrient management, water management and pest management appear to hold the key for high yields in all countries. In most countries that harvest high yields, using short duration varieties, the critical 'flowering-fruiting' window is compressed into a short span that makes crop management easier, to ensure efficient supply of nutrients and water when the crop is most hungry and thirsty. Cotton crop needs 80-85% of its total water and nitrogen requirement during the critical window of flowering and fruiting. Short duration varieties have a shorter vulnerable critical window that needs lesser management efforts. When sown in time with the onset of monsoon, under high density planting, the critical stage of flowering and fruiting will be able to get proper soil moisture and nutrients. Such varieties will have a narrow flowering window of 20-30 days that would possibly enable the crop to escape the American bollworms, while the early boll

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formation escapes the late season pest, the pink bollworm. Thus, pest management efforts and costs are minimised. Soil moisture would also be available adequately during the short flowering and boll formation window for the 7-9 developing bolls per plant. With available soil moisture, the plants are able to absorb available nutrients. Under high density planting of 160,000 to 200,000 plants per hectare, 7-9 bolls per plant result in high yields in a short time. Weather conditions of 27 to 32° C with day temperatures higher than 20° C and night temperatures higher than 12° C are prevalent during the monsoon and the immediate period after cessation of monsoon, which coincides ideally with the 20-30 day flowering and 60-90 day boll formation phase. Boll bursting is synchronous in high density planting. With the availability of adequate soil moisture and nutrients, the fibre quality is uniform and good. Intercropping with short duration legumes or cover crop with green manure crops provides adequate nitrogen exactly at the flowering and boll formation stage. Legume intercropping provides a wide range of beneficial natural enemies that assist in IPM, thereby reducing the need for insecticides. Cultivation of legume intercrops in between rows in high density systems or in crop rotation, reduces the need for repeated weeding and can assist in conservation agriculture. Canopy management would channelise nutrients more effectively into fruiting parts. Thus, with a combination of strategies of early sowing of short duration varieties under HDPS with controlled canopy and adjusting the narrow critical window to coincide with adequate natural resources, also enabling the critical window to escape biotic and a-biotic stress, coupled with providing water and nutrients to the crop at the critical phase, would result in doubling yields and ensure sustainable cotton cropping systems.

Indian cotton now has access to all technologies including IPM, IRM, INM, IWM, Bt-hybrids and Bt-varieties. Indian cotton breeders must focus on the development of short-duration varieties that are suitable for high density planting, possessing high harvest index, premium fibre qualities, with high nutrient-use efficiency and high ginning %. Such varieties can provide a sound foundation for the short season HDPS production systems for high yields at low management efforts and costs. With the new alternative system of high density planting with the new short duration Bt-varieties and Desi-varieties there can be a tremendous hope that yields can be easily doubled and cost of production can be reduced significantly. It is now only a matter of time and concentrated efforts for the country to emerge as a global leader in cotton productivity in a sustainable manner.

The Greek philosopher Epictetus says –*"All philosophy lies in two words, sustain and abstain"*. Nothing can be more relevant than this to the Indian cotton predicament. In the journey towards sustainable growth, what India needs today is to unlearn the recalcitrant dogmas and abstain from them while concomitantly attempting to learn and sustain novel ideas that evolved and made a huge positive difference to cotton in the main cotton countries. The changes suggested for learning and unlearning in this article may sound difficult today. But a change is imperative if the country has to be shielded from a down-slide. India may be at a disadvantage today due to the handicaps created by the obstinacy to change. I reiterate that Indian cotton yields would have easily been double than what they are today with deployment of 'Bt' technology in pure-line varieties under HDPS as is the case in other countries, instead of the innumerable, miserable long duration hybrids that are unsuited for a vast majority of India. While my argument for a complete cotton system revamp from hybrid saturation to at least '60% area under pure-line short-season varieties' may look improbable today, I believe that it will not be long before this change will happen naturally. My prediction is that, in the short run in the next 5 years, the Bt-varieties will overtake the Bt-hybrids. In the long run the long-staple Desi varieties will overtake the Bt-varieties. The change will be towards sustainability. India will emerge as the global leader for high yields and lowest cost of production. It is a dream that is destined to happen in the next 10 years, whether anyone likes the idea or not. India has its own obstinate handicaps today. But, it is these handicaps that would precipitate the change. Helen Keller puts it beautifully *"I thank God for my handicaps, for through them, I have found myself, my work and my God."* India will eventually find itself and its God through its handicaps or despite them. And finally to quote Abraham Lincoln *"The probability that we may fail in the struggle ought not to deter us from the support of a cause we believe to be just"*.

(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.)

Year/Month	Viscose Filament 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	40.92	1462.28	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-Nov.)	30.98	703.65	27.41	7.89	769.93
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	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	3.30	0.96	92.12
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	3.75	89.11	3.67	0.96	97.49
October	3.89	93.00	3.69	1.05	101.63
November	3.78	86.59	3.06	0.77	94.20
December	3.84	85.15	2.99	0.80	92.78

P - Provisional

Source : Office of the Textile Commissioner

CAI Maintains Cotton Crop for the 2016-17 Season

The Cotton Association of India (CAI) has released its January estimate of the cotton crop for the 2016-17 season beginning from 1st October 2016. The CAI has maintained the cotton crop for the 2016-17 season at 341.00 lakh bales of 170 kgs. each that is at the same as in the previous month. The CAI has however increased cotton consumption for the ongoing crop year to 295 lakh bales against its previous estimate of 290 lakh bales. The projected Balance sheet drawn by the CAI estimated total cotton supply for the cotton season 2016-17 at 405 lakh bales. Considering the domestic consumption of 295 lakh bales as stated above, total available surplus for the season works out to 110 lakh bales.

A statement containing the State-wise estimate of the cotton crop and the balance sheet for the cotton season 2016-17 with the corresponding data for the crop year 2015-16 is given below.

The pace of arrivals has started picking up lately and is now approaching 2 lakh bales a day as the farmers are realising better price for their produce.

CAI's Estimates of Cotton Crop as on 31st January 2017 for the Seasons 2016-17 and 2015-16

(in lakh bales)

State	Production *		Arrivals as on 31st January 2017 (2016-17)
	2016-17	2015-16	
Punjab	9.50	7.50	5.50
Haryana	20.50	17.00	9.25
Upper Rajasthan	7.00	5.50	3.00
Lower Rajasthan	10.50	10.50	8.00
Total North Zone	**47.50**	**40.50**	**25.75**
Gujarat	92.50	88.00	35.00
Maharashtra	86.00	78.00	46.00
Madhya Pradesh	20.00	18.75	8.50
Total Central Zone	**198.50**	**184.75**	**89.50**
Telangana	47.00	58.00	22.00
Andhra Pradesh	18.00	24.00	9.00
Karnataka	18.50	18.50	7.00
Tamil Nadu	5.50	7.00	0.75
Total South Zone	**89.00**	**107.50**	**38.75**
Orissa	4.00	3.00	2.50
Others	2.00	2.00	1.25
Total	**341.00**	**337.75**	**157.75**

*Note: (1) * Including loose*
(2) Loose figures are taken for Telangana and Andhra Pradesh separately as proportionate to the crop for the purpose of accuracy

The Balance Sheet drawn by the Association for 2016-17 and 2015-16 is reproduced below:-

(in lakh bales)

Details	**2016-17**	**2015-16**
Opening Stock	45.00	67.25
Production	341.00	337.75
Imports	19.00	22.00
Total Supply	**405.00**	**427.00**
Mill Consumption	260.00	275.00
Consumption by SSI Units	25.00	25.00
Non-Mill Use	10.00	10.00
Exports		72.00
Total Demand	**295.00**	**382.00**
Available Surplus	**110.00**	
Closing Stock		**45.00**

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) 2016-17 Crop FEBRUARY 2017					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Strength /GPT	13th	14th	15th	16th	17th	18th
1	P/H/R	ICS-101	Fine	Below 22mm	5.0-7.0	15	9392 (33400)	9392 (33400)	9476 (33700)	9476 (33700)	9420 (33500)	9280 (33000)
2	P/H/R	ICS-201	Fine	Below 22mm	5.0-7.0	15	9673 (34400)	9673 (34400)	9758 (34700)	9758 (34700)	9701 (34500)	9561 (34000)
3	GUJ	ICS-102	Fine	22mm	4.0-6.0	20	8717 (31000)	8548 (30400)	8492 (30200)	8436 (30000)	8352 (29700)	8267 (29400)
4	KAR	ICS-103	Fine	23mm	4.0-5.5	21	9758 (34700)	9673 (34400)	9673 (34400)	9673 (34400)	9589 (34100)	9505 (33800)
5	M/M	ICS-104	Fine	24mm	4.0-5.0	23	10770 (38300)	10686 (38000)	10686 (38000)	10686 (38000)	10601 (37700)	10517 (37400)
6	P/H/R	ICS-202	Fine	26mm	3.5-4.9	26	12176 (43300)	12148 (43200)	12148 (43200)	12148 (43200)	12063 (42900)	11895 (42300)
7	M/M/A	ICS-105	Fine	26mm	3.0-3.4	25	11051 (39300)	11135 (39600)	11164 (39700)	11164 (39700)	11107 (39500)	11051 (39300)
8	M/M/A	ICS-105	Fine	26mm	3.5-4.9	25	11445 (40700)	11529 (41000)	11557 (41100)	11557 (41100)	11501 (40900)	11445 (40700)
9	P/H/R	ICS-105	Fine	27mm	3.5.4.9	26	12345 (43900)	12317 (43800)	12317 (43800)	12317 (43800)	12232 (43500)	12063 (42900)
10	M/M/A	ICS-105	Fine	27mm	3.0-3.4	26	11164 (39700)	11248 (40000)	11276 (40100)	11276 (40100)	11220 (39900)	11164 (39700)
11	M/M/A	ICS-105	Fine	27mm	3.5-4.9	26	11670 (41500)	11670 (41500)	11698 (41600)	11698 (41600)	11642 (41400)	11585 (41200)
12	P/H/R	ICS-105	Fine	28mm	3.5-4.9	27	12401 (44100)	12373 (44000)	12373 (44000)	12373 (44000)	12288 (43700)	12120 (43100)
13	M/M/A	ICS-105	Fine	28mm	3.5-4.9	27	11782 (41900)	11838 (42100)	11867 (42200)	11867 (42200)	11754 (41800)	11698 (41600)
14	GUJ	ICS-105	Fine	28mm	3.5-4.9	27	11867 (42200)	11895 (42300)	11923 (42400)	11923 (42400)	11810 (42000)	11754 (41800)
15	M/M/A/K	ICS-105	Fine	29mm	3.5-4.9	28	11895 (42300)	11979 (42600)	12007 (42700)	12007 (42700)	11895 (42300)	11838 (42100)
16	GUJ	ICS-105	Fine	29mm	3.5-4.9	28	12007 (42700)	12035 (42800)	12063 (42900)	12063 (42900)	11951 (42500)	11895 (42300)
17	M/M/A/K	ICS-105	Fine	30mm	3.5-4.9	29	12120 (43100)	12120 (43100)	12120 (43100)	12120 (43100)	12035 (42800)	12007 (42700)
18	M/M/A/K/T/O	ICS-105	Fine	31mm	3.5-4.9	30	12345 (43900)	12345 (43900)	12345 (43900)	12345 (43900)	12260 (43600)	12232 (43500)
19	A/K/T/O	ICS-106	Fine	32mm	3.5-4.9	31	12485 (44400)	12485 (44400)	12485 (44400)	12485 (44400)	12429 (44200)	12401 (44100)
20	M(P)/K/T	ICS-107	Fine	34mm	3.0-3.8	33	15635 (55600)	15635 (55600)	15635 (55600)	15635 (55600)	15607 (55500)	15578 (55400)

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