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The History of Introduction of American Cotton into India

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GUEST COLUMN
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There are four species of cultivated cotton – *Gossypium hirsutum* (American cotton), *G. barbadense* (Egyptian cotton), *G. arboreum* (Asiatic cotton) and *G. herbaceum* (Levant cotton). Till the middle of the 18th century, only the indigenous cotton species viz *G. arboreum* and *G. herbaceum* (together called desi cotton) were grown in India. These were short staple and coarse cottons, but spinners and weavers dexterously spun very fine yarn and weaved them to produce the finest cloth. The first seeds of American cotton were sown in the Indian soil 1790 and today more than 92% of the cotton grown in India is of this type. This article recollects the reasons for introduction of the American, *G. hirsutum* cotton and

summarises the painstaking efforts to establish this cotton in India.

The Reason for Introduction of American Cotton

The industrial revolution, in England in the 18th century transformed the nature and scale of cotton production and trade across the globe. A series of inventions during this period, notably the James Watt's steam engine (1776), William Hargreaves's spinning jenny (1764), Richard Arkwright's spinning water frame (1733), Samuel Crompton's spinning mule (1779) and Eli Whitney's cotton gin (1792), dramatically altered the process, scale and speed of manufacture of textiles in England. The establishment of Lancashire textile industry spurred-up the demand for cotton in England.

Ironically, only medium staple cotton with good strength could be spun in Arkwright's spinning frame. Bulk of the cotton required was therefore imported from America where *G. hirsutum* cotton of medium staple length and good strength was grown abundantly. However, the American Revolutionary War (1775-83) reduced the supply of raw cotton to the textile mills of England. The British therefore looked towards other countries including Brazil, Egypt, Turkey and India to supply raw cotton. It

was felt that the short stapled and coarse fibred *desi* cotton grown in India was not suitable for the mechanised Lancashire and Manchester mills.

In 1790, the East India Company started systematic efforts in different parts of India to replace *desi* cotton with medium and long staple *G. hirsutum* (American) cotton to feed the textile industry of England.

Early Efforts to Introduce American Cotton in the 18th and 19th Century

The Court of Directors of East India Company was keen to establish and adapt American cotton in India to provide an uninterrupted supply of raw cotton to the mills in England. They ordered a series of trials to be initiated in India to expand the cultivation of American cotton. A brief account of these efforts at various locations is summarised below.

As early as 1790, Dr. Anderson was employed for distributing seeds of American cotton from Mauritius and Bourbon cotton (*G. hirsutum* race *punctatum*) from Malta throughout the Peninsular India. In 1793, Dr Willam Roxburgh, ascertained that elevated, dry, less fertile soils of the Coromandel were better suited for Bourbon cotton. In 1818, four cotton farms of 400 acre each were established in Tinnellvely, Coimbatore, Masulipatnam and Vizakapatnam to test the American cottons.

The Bourbon cotton was first introduced in the Bombay Presidency in 1790. In 1794, an experimental farm was established at Rhaudaterra near Tellichery in Malabar mainly for spices, but in 1801 Mauritius and Nankeen cottons were evaluated there. In 1812, a fresh lot of seeds of Bourbon cotton was procured and distributed to the Collectors of Surat and Broach along with directions for its cultivation in the Bombay Presidency. In 1815, Assistant-Surgeon Gilder succeeded in cultivating Bourbon cotton at Kaira, Gujarat, but the effort could not be scaled up.

In 1826, Lord Ellenborough the then President of the Board of Control for India, recommended undertaking additional trials across distant soils and climates to try and adapt American cotton in India. Cotton farms were established in 1829 in Broach, Gujarat under the supervision of Mr. Finney and in Deccan, Khandesh and Dharwar under the supervision of Dr. Charles Lush. In March 1839, Captain Thomas Bayles of the Madras Army was deputed to America to procure seeds of American cotton. Experienced American planters were also

hired to set up experimental farms in India. A series of experiments were launched in various provinces to acclimatise American cotton in India.

In Dharwar, based on climatic analogy, an attempt was made to replace the indigenous Kumta cotton by New Orleans variety belonging to *G. hirsutum* var *latifolium* in 1842. During the period 1851- 1861, the area under New Orleans cotton increased from 31668 acres to 191026 acres. From Hubli taluk these cottons spread to Bankapur and Ranebenur talukas where the rainfall pattern and soil moisture conditions were more conducive. The New Orleans variety soon became popular as 'Dharwar - American cotton'.

Despite initial optimism, these introductory efforts could not provide lasting success. Continuous mono-cropping of this variety (instead of the prevailing cotton - pearl millet rotation) caused decline in soil fertility and by 1870's both the productivity and quality of Dharwar - American cotton deteriorated and the local Kumta cotton regained its lost acreage. The reputation of the Dharwar-American variety also fell, owing to adulteration and admixture with the indigenous Kumta cotton.

Efforts to introduce Dharwar American cotton into Broach (Gujarat) and Hinganghat (Central Province and Berar) in Bombay Presidency, also proved futile. Trials with Bombay (*G. hirsutum*) and New Orleans (*G. barbadense*) were conducted between 1848 and 1853 in Coimbatore district of Madras province, but the yields were unimpressive and though the experiments were terminated in 1853, the seeds were not withdrawn.

Attempt to grow American cotton in the United Province dates back to 1826. In 1841, the work was intensified by American planters, but their efforts did not succeed. In 1870, cotton farms were established at Cawnpore and Allahabad. The work at Allahabad was later discontinued but the selection work continued in Cawnpore. In the Central Province and Berar too, Brazilian cottons were introduced in 1839, but the efforts proved futile. More over in this region, a long staple *G. arboreum* cotton "Bani" was already popular.

Experiments to introduce American cotton in the Punjab Provinces commenced in 1853 at Shahpur farm. From 1876-77 onwards, seeds of Dharwar American cotton were regularly distributed at several locations in the Province but the efforts failed to produce the desired results.

After several failed attempts, it was concluded that exotic cottons were not suitable under Indian conditions. Susceptibility of American cotton to pests and diseases, their inability to cope with the uneven rainfall pattern and progressive deterioration in productivity and fibre quality were the main reasons attributed for the failure to establish American Cotton in India.

Trials in the experimental farms and organised distribution of fresh American cotton seeds were discontinued. However, selection and purification work continued in some farms. Efforts were also initiated to improve the indigenous cottons and preventing mixtures. In some pockets, farmers continued to grow small quantities of American cotton.

Seeds of Hope in the 20th Century

Systematic R&D work on cotton got a fillip up in 1904, with the setting up of Agricultural Departments in various Provinces. In 1904-05, exotic American cotton, adapted to the agro-climate of Cambodia was introduced into the Madras Presidency. This cotton established itself well in a small compound in Viruthupatty (now Virudhanagar) under irrigated conditions. In the southern districts, it soon became popular as Tirunelveli cotton and it later spread throughout Tamil Nadu as "Cambodia Cotton".

In 1891, Mr. G. R. Wilson was appointed as the first cotton specialist in the Madras Province and was entrusted with responsibility of improving the American cotton. He set up the Cotton Research Station in Coimbatore and appointed Mr. V. Ramanatha Ayyar as Assistant Cotton Specialist. Together, they undertook the improvement programme of Cambodia cotton. By 1912, the acreage under Cambodia cotton in the Madras Presidency increased to 60,000 acres.

A selection from the early introduction of Dharwar Cotton into Punjab Province called 'Punjab Narma' was found growing in farmers' fields in the Shahpur, Jullundur and Lahore districts in 1902. Work on American cotton, which had begun at Hissar in 1902, was transferred to Lyallpur in 1903. Ms. Mela Ram and Sons of Lahore provided seeds of 'Punjab Narma' from stray American cotton plants grown as mixtures in desi cotton fields. These were sown in Lyallpur farm in 1903 and the trials were extended to Sargodha farm in 1905.

The American cotton improvement initiated by Mr. A.C. Dobbs, the then Principal of Agricultural College Lyallpur in 1906 and from 1908, by Mr. D. Milne, an economic botanist by profession continued

this work. Milne's efforts resulted in the evolution of varieties 3F and 4F in 1912. The variety 4F had rough leaves, offered better tolerance to jassids and hence became popular. In a span of four years, 1913 to 1917, the area under this variety increased from 30000 acres to 276000 acres. Subsequently two varieties 280F and 285F were developed at Lyallpur.

In 1933, Sardar Bahadur Labh Singh developed a variety LSS (Labh Singh Selection), a late maturing but superior American cotton variety. This indeed was a landmark in cotton breeding in India.

American cotton improvement work in the United Province resulted in a variety of mixed origin later known as Cawnpore American. Sir Bryce Burt, the Deputy Director of Agriculture, isolated the Cawnpore American variety in 1909.

Buoyed by the successful establishment of Cambodian cotton in Tamil Nadu, fresh seeds of American cotton were sourced from Cambodia and Mr. G. R. Wilson planted 40 lots of these seeds separately at Coimbatore. Pure line selections from Cambodian types were initiated. In 1929, Ramanatha Ayyar released a superior Cambodian cotton variety, Co. 2 which became popular and later served as a parent for many cotton varieties developed in the post independence period.

A committee under the Chairmanship of Mr. J. Mckenna, Chairman of the Indian Cotton Committee suggested an action plan to develop and popularise American cotton in India. In 1923, the Indian Central Cotton Committee was established to promote cotton research in India. In 1937, during the first Conference of Indian Central Cotton Committee, Rao Bahadur Ramanatha Ayyar appealed to vigorously pursue research on *G. hirsutum* cotton.

Interestingly, in the same conference, Dr. J. B. Hutchenson, Director, Institute of Plant Industry, Indore, opposed this proposal and stated that the potential of *desi* cotton was yet to be fully exploited. This *desi* versus American cotton debate still continues unabated. Notwithstanding the arguments and counter arguments in favor of *desi*/American cotton, R & D during the post independence period helped to steadily increase the area under American cotton from a mere 3% in 1947 to almost 93% today. Of late, scientists have realised the robustness of *desi* cotton in the era of climatic uncertainties and are now advocating *desi* cotton.

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



Since 1921, we are dedicated to the cause of Indian cotton.

Just one of the reasons, you should use our Laboratory Testing Services.

The Cotton Association of India (CAI) is respected as the chief trade body in the hierarchy of the Indian cotton economy. Since its origin in 1921, CAI's contribution has been unparalleled in the development of cotton across India.

The CAI is setting benchmarks across a wide spectrum of services targeting the entire cotton value chain. These range from research and development at the grass root level to education, providing an arbitration mechanism, maintaining Indian cotton grade standards, issuing Certificates of Origin to collecting and disseminating statistics and information. Moreover, CAI is an autonomous organization portraying professionalism and reliability in cotton testing.

The CAI's network of independent cotton testing & research laboratories are strategically spread across major cotton centres in India and are equipped with:

- State-of-the-art technology & world-class Premier and MAG cotton testing machines
- HVI test mode with trash% tested gravimetrically

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Current locations : • **Maharashtra :** Mumbai; Yavatmal; Aurangabad • **Gujarat :** Rajkot; Kadi; Ahmedabad • **Andhra Pradesh :** Adoni
• **Madhya Pradesh :** Khargone • **Karnataka :** Hubli • **Punjab :** Bathinda • **Telangana:** Warangal, Adilabad



COTTON ASSOCIATION OF INDIA

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Glimpses of Mahashivratri Festival

Mahashivratri was celebrated at the Bhid Bhanjan Mahadev Temple at Colaba, Mumbai, on February 21, 2020.



FEES FOR COTTON TESTING CHARGES AT CAI LABORATORIES

Particulars	Per Sample Testing Fees in Rs.					
	Member			Non Member		
	Testing Fees	GST	Total	Testing Fees	GST	Total
HVI Test	130	23	153	140	25	165
Micronaire Test	70	13	83	75	14	89
Colour Grade on HVI	70	13	83	75	14	89
Gravimetric Trash Test on HVI	70	13	83	75	14	89
Moisture	70	13	83	75	14	89
Grading (Manual Classing)	220	40	260	245	44	289

VOLUME BASED DISCOUNTS

Particulars	Per Sample Testing Fees in Rs.					
	Member			Non Member		
	Testing Fees	GST	Total	Testing Fees	GST	Total
For 250 samples and above but less than 500 samples	125	23	148	135	24	159
For 500 samples and above but less than 750 samples	120	22	142	130	23	153
For 750 samples and above but less than 1000 samples	115	21	136	125	23	148
For 1000 samples and above but less than 2000 samples	110	20	130	120	22	142
For 2000 samples and above but less than 5000 samples	105	19	124	115	21	136
For 5000 samples and above	100	18	118	110	20	130

The entire fees under the above volume based discount scheme is payable in advance and the volumes under the same can be exhausted during the period of two years.

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) 2018-19 Crop February 2020					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Gravimetric Trash	Strength /GPT	17th	18th	19th	20th	21st	22nd
1	P/H/R	ICS-101	Fine	Below 22mm	5.0 – 7.0	4%	15	-	-	-	-	-	-
2	P/H/R (SG)	ICS-201	Fine	Below 22mm	5.0 – 7.0	4.5%	15	-	-	-	-	H	-
3	GUJ	ICS-102	Fine	22mm	4.0 – 6.0	13%	20	9167 (32600)	9167 (32600)	9083 (32300)	8998 (32000)	-	8914 (31700)
4	KAR	ICS-103	Fine	23mm	4.0 – 5.5	4.5%	21	9758 (34700)	9758 (34700)	9758 (34700)	9673 (34400)	-	9729 (34600)
5	M/M (P)	ICS-104	Fine	24mm	4.0 – 5.5	4%	23	-	-	-	-	O	-
6	P/H/R (U) (SG)	ICS-202	Fine	27mm	3.5 – 4.9	4.5%	26	-	-	-	-	-	-
7	M/M(P)/SA/TL	ICS-105	Fine	26mm	3.0 – 3.4	4%	25	-	-	-	-	L	-
8	P/H/R(U)	ICS-105	Fine	27mm	3.5 – 4.9	4%	26	-	-	-	-	-	-
9	M/M(P)/SA/TL/G	ICS-105	Fine	27mm	3.0 – 3.4	4%	25	-	-	-	-	-	-
10	M/M(P)/SA/TL	ICS-105	Fine	27mm	3.5 – 4.9	3.5%	26	-	-	-	-	I	-
11	P/H/R(U)	ICS-105	Fine	28mm	3.5 – 4.9	4%	27	-	-	-	-	-	-
12	M/M(P)	ICS-105	Fine	28mm	3.7 – 4.5	3.5%	27	-	-	-	-	-	-
13	SA/TL	ICS-105	Fine	28mm	3.7 – 4.5	3.5%	27	-	-	-	-	D	-
14	GUJ	ICS-105	Fine	28mm	3.7 – 4.5	3%	27	-	-	-	-	-	-
15	R(L)	ICS-105	Fine	29mm	3.7 – 4.5	3.5%	28	-	-	-	-	-	-
16	M/M(P)	ICS-105	Fine	29mm	3.7 – 4.5	3.5%	28	-	-	-	-	-	-
17	SA/TL/K	ICS-105	Fine	29mm	3.7 – 4.5	3%	28	-	-	-	-	A	-
18	GUJ	ICS-105	Fine	29mm	3.7 – 4.5	3%	28	-	-	-	-	-	-
19	M/M(P)	ICS-105	Fine	30mm	3.7 – 4.5	3.5%	29	-	-	-	-	-	-
20	SA/TL/K/O	ICS-105	Fine	30mm	3.7 – 4.5	3%	29	-	-	-	-	Y	-
21	M/M(P)	ICS-105	Fine	31mm	3.7 – 4.5	3%	30	-	-	-	-	-	-
22	SA/TL/K/TN/O	ICS-105	Fine	31mm	3.7 – 4.5	3%	30	-	-	-	-	-	-
23	SA/TL/K/TN/O	ICS-106	Fine	32mm	3.5 – 4.2	3%	31	-	-	-	-	-	-
24	M/M(P)	ICS-107	Fine	34mm	3.0 – 3.8	4%	33	-	-	-	-	-	-
25	K/TN	ICS-107	Fine	34mm	3.0 – 3.8	3.5%	33	-	-	-	-	-	-

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

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) 2019-20 Crop February 2020					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Gravimetric Trash	Strength /GPT	17th	18th	19th	20th	21st	22nd
1	P/H/R	ICS-101	Fine	Below 22mm	5.0 - 7.0	4%	15	10011 (35600)	10011 (35600)	10011 (35600)	10011 (35600)		10011 (35600)
2	P/H/R (SG)	ICS-201	Fine	Below 22mm	5.0 - 7.0	4.5%	15	10151 (36100)	10151 (36100)	10151 (36100)	10151 (36100)	H	10151 (36100)
3	GUJ	ICS-102	Fine	22mm	4.0 - 6.0	13%	20	-	-	-	-		-
4	KAR	ICS-103	Fine	23mm	4.0 - 5.5	4.5%	21	-	-	-	-	O	-
5	M/M (P)	ICS-104	Fine	24mm	4.0 - 5.5	4%	23	9617 (34200)	9645 (34300)	9645 (34300)	9673 (34400)		9673 (34400)
6	P/H/R (U) (SG)	ICS-202	Fine	27mm	3.5 - 4.9	4.5%	26	10629 (37800)	10686 (38000)	10686 (38000)	10742 (38200)		10742 (38200)
7	M/M(P)/SA/TL	ICS-105	Fine	26mm	3.0 - 3.4	4%	25	-	-	-	-	L	-
8	P/H/R(U)	ICS-105	Fine	27mm	3.5 - 4.9	4%	26	10770 (38300)	10826 (38500)	10826 (38500)	10882 (38700)		10882 (38700)
9	M/M(P)/SA/TL/G	ICS-105	Fine	27mm	3.0 - 3.4	4%	25	-	-	-	-		-
10	M/M(P)/SA/TL	ICS-105	Fine	27mm	3.5 - 4.9	3.5%	26	-	-	-	-	I	-
11	P/H/R(U)	ICS-105	Fine	28mm	3.5 - 4.9	4%	27	10854 (38600)	10911 (38800)	10911 (38800)	10967 (39000)		10967 (39000)
12	M/M(P)	ICS-105	Fine	28mm	3.7 - 4.5	3.5%	27	10854 (38600)	10882 (38700)	10882 (38700)	10911 (38800)		10911 (38800)
13	SA/TL	ICS-105	Fine	28mm	3.7 - 4.5	3.5%	27	10939 (38900)	10967 (39000)	10967 (39000)	10995 (39100)	D	10995 (39100)
14	GUJ	ICS-105	Fine	28mm	3.7 - 4.5	3%	27	10854 (38600)	10882 (38700)	10911 (38800)	10939 (38900)		10939 (38900)
15	R(L)	ICS-105	Fine	29mm	3.7 - 4.5	3.5%	28	11079 (39400)	11107 (39500)	11107 (39500)	11164 (39700)		11164 (39700)
16	M/M(P)	ICS-105	Fine	29mm	3.7 - 4.5	3.5%	28	11051 (39300)	11079 (39400)	11079 (39400)	11107 (39500)	A	11107 (39500)
17	SA/TL/K	ICS-105	Fine	29mm	3.7 - 4.5	3%	28	11107 (39500)	11135 (39600)	11135 (39600)	11164 (39700)		11164 (39700)
18	GUJ	ICS-105	Fine	29mm	3.7 - 4.5	3%	28	11051 (39300)	11079 (39400)	11107 (39500)	11135 (39600)		11135 (39600)
19	M/M(P)	ICS-105	Fine	30mm	3.7 - 4.5	3.5%	29	11220 (39900)	11248 (40000)	11276 (40100)	11304 (40200)	Y	11304 (40200)
20	SA/TL/K/O	ICS-105	Fine	30mm	3.7 - 4.5	3%	29	11304 (40200)	11332 (40300)	11332 (40300)	11360 (40400)		11360 (40400)
21	M/M(P)	ICS-105	Fine	31mm	3.7 - 4.5	3%	30	11698 (41600)	11726 (41700)	11726 (41700)	11754 (41800)		11754 (41800)
22	SA/TL/K / TN/O	ICS-105	Fine	31mm	3.7 - 4.5	3%	30	11810 (42000)	11838 (42100)	11838 (42100)	11867 (42200)		11867 (42200)
23	SA/TL/K/ TN/O	ICS-106	Fine	32mm	3.5 - 4.2	3%	31	12232 (43500)	12260 (43600)	12260 (43600)	12288 (43700)		12288 (43700)
24	M/M(P)	ICS-107	Fine	34mm	3.0 - 3.8	4%	33	15578 (55400)	15466 (55000)	15466 (55000)	15466 (55000)		15466 (55000)
25	K/TN	ICS-107	Fine	34mm	3.0 - 3.8	3.5%	33	16028 (57000)	16028 (57000)	16028 (57000)	16028 (57000)		16028 (57000)

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