

Cotton Innovate

A Monthly Newsletter from ICAR-Central Institute for Cotton Research, Nagpur



An art of hybridisation
Photo: Dr. M. Sabesh

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www.cicr.org.in



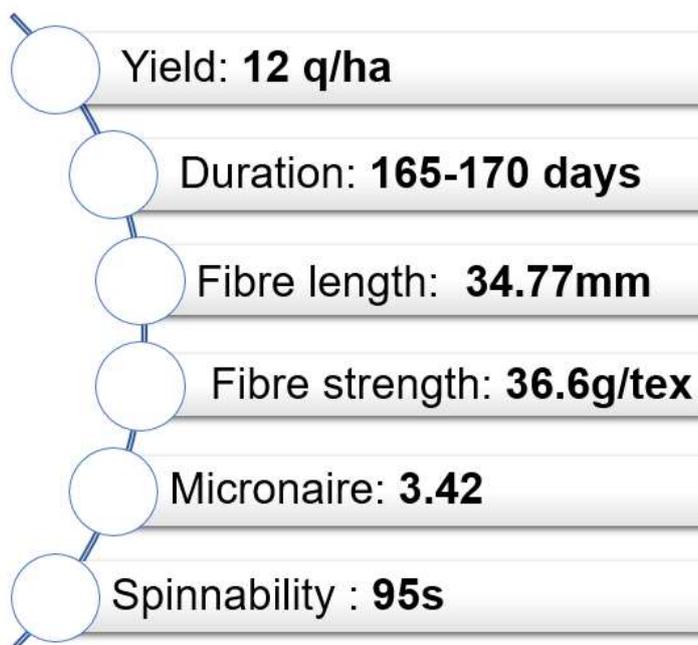
Invited Research Note

CICR B COTTON 37 – A promising Extra Long Staple Cotton Variety

Dr. A. Manivannan

ICAR-Central Institute for Cotton Research Regional Station, Coimbatore, India

Annual production of Extra Long Staple (ELS) cotton in India is about 25000 tonnes when compared with domestic demand of 95000 tones. This shortfall is being met out with import of ELS cotton from other countries. Low yield potential, longer duration of crop and susceptibility to sucking pests are the main impediments for enhancing productivity and wider adoption of ELS cotton cultivation. This scenario could be improved by strategic planning to increase the production by improved ELS cotton varieties and hybrids, agile seed supply, ensuring of premium prices, and area expansion. One such effort to address the ELS cotton demand is to release of high yielding premium fibre quality ELS variety. In pursue of the same goal, recently ICAR-CICR, RS, Coimbatore developed a *G. baradense* variety CICR B COTTON 37. It is the second variety in *G. barbadense* species after Suvin which was released in 1974. CICR B Cotton 37 has been identified for commercial cultivation under irrigated conditions of South zone (Telangana, Andhra Pradesh, Karnataka and Tamil Nadu) by Central Variety Identification Committee in the Annual Group Meet of ICAR-AICRP on Cotton held in May 2020.



CICR B Cotton-37 – A Promising ELS Cotton Variety

The CICR B Cotton 37 was developed from Suvin x (Suvin x Giza-70) through a backcross breeding programme. It was tested in 'ICAR-AICRP on Cotton' in kharif seasons during 2016-17 to 2018-19 and recorded an overall superiority to Zonal check variety, Suvin. It recorded mean seed cotton yield of 1237 kg/ha as against 1154 kg/ha of the Zonal check variety under irrigated conditions. This variety has a yield potential of 1932 kg/ha which was recorded in Lam, Guntur centre during 2018-19 breeding trial. It showed better yield superiority in closer spacing with highest seed cotton yield of 1493kg/ha recorded in 90 x 60cm spacing with recommended dose of fertilizers. The variety CICR B Cotton 37 registered high ginning outturn of 32.5% as compared to 32% in zonal check and is comparable with the qualifying varieties. It has better fibre quality trait combination viz., Upper Half Mean Length of 34.7 mm, micronaire of 3.4 and tenacity of 36.6 g/tex in HVI mode. Highest bundle strength of 40.2 g/tex for this variety was recorded in Lam, Guntur centre during 2018-19 in breeding trial. The new ELS variety 'CICR B Cotton 37' possesses good yield potential and better-quality parameters with appreciable tolerance to pests and diseases.

Considering its better yield and fibre qualities, it is expected that this variety will gain preference among the cotton farmers in the South zone of India and in turn help the Nation in import substitution of ELS cotton. This variety was developed by Dr. KPM Dhamayanthi, Dr K.Rathinavel, Dr A.Manivannan and Mrs. K. Subhashree of ICAR-Central Institute for Cotton Research (CICR) Regional Station, Coimbatore.

Performance of CICR B Cotton 37 vis-a-vis Suvin



Characters	CICR B Cotton 37	Suvin ©
Yield (kg/ha)	1237	1157
Ginning Percentage (%)	32	30
Boll weight (g)	3.5	2.9
Boll No/plant	31	29
Fibre length/UHML (mm)	34.77	36.65
Fibre Strength (g/tex)	36.60	36.68
Micronaire ($\mu\text{g}/\text{inch}$)	3.42	3.08
Duration (days)	165-170	180-210

Cotton click of the month



An art of hybridisation
Photo: Dr. M. Sabesh

Popular Article

Tea mosquito bug in cotton

M. Amutha, J. Gulsar Banu, K. Rameash and K. Shankarganesh

ICAR-Central Institute for Cotton Research (CICR) Regional Station, Coimbatore, Tamil Nadu

Tea Mosquito Bug (TMB) is a sucking pest belonging to genus, *Helopeltis* (Hemiptera: Miridae). Three species of TMB, *Helopeltis antonii* Signoret, *Helopeltis bradyi* Waterhouse and *Helopeltis theivora* Waterhouse were recorded in India. Infestation of Tea Mosquito Bug, *Helopeltis theivora* was recorded for the first time on cotton at ICAR-CICR Regional Station, Coimbatore during 2018 in net house (Dharajothi et al. 2018). During 2019-20, severe infestation of TMB was observed under field conditions, which indicated the susceptibility of cotton crop to this emerging pest. Taking into consideration the importance of this pest, systematic studies were initiated to assess the damage potential and biology of this pest during cropping season of 2020-21. Eggs of TMB are tiny, elongate and are inserted into tender shoots, either singly or in groups of 2-6, only the pair of tiny hair like chorionic processes of each egg was visible outside. Nymph hatches in 5-7 days, undergoes five instars in a period of 8-12 days and develops as adults.



Witches Broom Symptom



Bolls affected by TMB



Deformed, curled up leaves and dried bud



Punctures caused by TMB



Punctures caused by TMB in 24 hours



Egg with chorionic processes



Adult Female



Adult Male

New initiatives in cotton stem weevil management

K. Shankarganesh, K. Rameash and M. Amutha

ICAR -Central Institute for Cotton Research, Regional Station, Coimbatore, Tamil Nadu

Cotton stem weevil, *Pempherus affinis* (Faust) [=*Pempherulus affinis* (Faust)], Curculionidae, Coleoptera, is a major pest of cotton in South India especially in all cotton growing Districts of Tamil Nadu. Earlier studies at ICAR-CICR revealed that the infestation of the stem weevil commences fairly in early growth stage of the crop i.e., when the crop is about two weeks old. These weevils lay eggs on soft tissues near the nodal region of the plant. The larvae hatch out from the egg within 7-10 days of the oviposition. The larvae tunnels between the bark and the stem, generally just above the ground level. The infested plants exhibit characteristic stem galls at the site of infestation. Nodular swellings (stem galls), lodging and breaking of badly infested plants are observed. Usually a single larva is present, but occasionally there are two also. When cotton plants of less than 60 days old are infested, they are often killed. Older plants may survive though they lose vigour leading to yield loss. Symptoms are detected only after complete damage of the plant by the pest. The infested stems may break at the point of infestation during severe stress. Many researchers have studied stem weevil and management strategies were advocated accordingly. Research is in progress at ICAR-CICR Regional Station, Coimbatore on screening of selected Bt hybrids and non-Bt varieties such as MCU-3, Surabhi, Suraj, Sumangala, LRA5166, MCU-5VT for their susceptibility to stem weevil and to understand the mechanism of tolerance (biochemical basis and non-preference). The studies on mass culturing of cotton stem weevil under laboratory condition, morphometry, extraction of semiochemicals from the cotton plant as well as cotton stem weevil is in progress.



Eggs laid under laboratory condition



Different stages of stem weevil larvae observed under field condition



Stem weevil adult



Stem gall symptom

CICR Happenings

List of important events or meetings during the month

Event / Meeting	Venue	Date
Workshop for Cotton ginners and Agro-input dealers under IRM Project	ICAR-CICR Regional Station, Sirsa	March 02, 2021
Meeting with Rasi seeds for collaborative trials in kharif 2021	ICAR-CICR, Nagpur	March 02, 2021
Training on importance and use of pesticide protection kit under SCSP scheme	Tekari, Nagbhir, Chandrapur Dhamangaon Chak, Nagbhir, Chandrapur	March 06, 2021
International Women's Day	ICAR-CICR, Nagpur	March 08, 2021
Training on importance and use of cotton-picking bag & pesticide protection kit under SCSP scheme	Pimpalgaon Lute, Deoli, Wardha Durgada, Deoli, Wardha	March 10, 2021
Farmers' Training-cum-Field Day	ICAR-CICR Regional Station, Sirsa	March 10, 2021
World Water Day	Virtual mode	March 22, 2021
Kisan mela	ICAR-CICR Regional Station, Sirsa	March 26, 2021
Training on Goat farming under SCSP scheme	Bondri, Ramtek, Nagpur	March 27, 2021
Program for felicitation of Dr. O P Tuteja, I/c Head, Regional Station, Sirsa on superannuation	Virtual mode	March 31, 2021



Workshop for Cotton ginners and Agro-input dealers under IRM Project at Sirsa



Training on pesticide protection kit at Dhamangaon Chak, Nagbhir, Chandrapur



Training on pesticide protection kit at Tekari, Nagbhir, Chandrapur



CICR Happenings

International Women's Day 2021

ICAR-CICR celebrated International Women's day on March 8, 2021 with the theme on 'Women Leadership in Agriculture: Entrepreneurship, Equity and Empowerment'. Dr. Y. G. Prasad, Director ICAR-CICR, Nagpur, A.A.Goswami, Sr. Administrative Officer, Head of Divisions, total of 200 farm labours, 150 staff graced the programme. Director ICAR-CICR felicitated the retiring Women employees for their successful service to the institute. Various talents of Womanhood were brought out by conducting essay competition on the title "Strong Women for a strong Nation", Rangoli competition, Singing and Fancy-dress competition for all the women staff of the institute. The winners were distributed with cash awards



Various Cultural programmes on the occasion of International Women's Day 2021

CICR Happenings



Dr. Y. G. Prasad, Director, ICAR-CICR felicitating the women staff.



Happy Women's Day
to all the Women Scientists of CICR

CICR Happenings



Training on Goat farming under SCSP scheme at Bondri, Ramtek, Nagpur



Farmers' Training-cum-Field Day at Sirsa



Kisan Mela at ICAR-CICR Regional Station, Sirsa

CICR Happenings

Students visit ICAR-CICR, Regional Station, Coimbatore

Fifteen B.Sc. students of Zoology department along with 2 faculty members from Vellalar College for Women visited ICAR-CICR, Regional Station on March 1, 2021. Dr. K. Shankar Ganesh, Senior Scientist (Entomology) and Dr. A. Manivannan, Scientist (Genetics and Plant Breeding) interacted with students and highlighted the research contributions of the station. Field and laboratory visits were also arranged during the visit.

Superannuation of Dr. O. P. Tuteja, Principal Scientist (Plant Breeding), ICAR-CICR, Regional Station, Sirsa

Dr. O. P. Tuteja, Principal Scientist (Plant Breeding), ICAR-CICR, Regional Station, Sirsa retired as Head (i/c) of the station on March 31, 2021 after serving the institute for 35 years. He has released many popular varieties and hybrids for north zone of the country and also received several prestigious awards during his career. Director and staff of ICAR-CICR bid affectionate farewell to Dr. O. P. Tuteja by recalling his contributions to CICR and cotton farmers.



'Wild Species Garden' of ICAR-CICR enriched with the addition of two tetraploid wild species of Gossypium

Cotton (*Gossypium* spp.) is one of the most important and earliest domesticated plants in the world. *Gossypium* genus is extraordinarily diverse, with eight diploid genome groups (A–G, and K) with 46 species together and one allopolyploid group (AD) with 7 tetraploid species. Two diploids (*G. arboreum* and *G. herbaceum*; carrying A genome; $x = 13$) and two tetraploids (*G. hirsutum* and *G. barbadense*; carrying AD genome; $x = 26$) represent cultivated species while rest are wild species and relatives. Wild species are considered as most valuable genetic resources for cotton in general and cotton improvement in particular. They can contribute in generating newer variability for traits of economic interest through development of breeding-ready material through interspecific hybridization mediated pre-breeding. ICAR-CICR is conserving and maintaining 24 wild species of *Gossypium*, all of which are diploid species belonging to secondary and tertiary gene pool. Pre-breeding success through diploid wild species for tetraploid cotton improvement is very difficult and highly challenging. The wild allotetraploid species viz., *G. tomentosum*, *G. mustelinum*, *G. darwinii*, *G. ekmanianum* and *G. stephensii* are classified along with cultivated tetraploid species viz., *G. hirsutum* and *G. barbadense* as primary gene pool and they are cross-compatible with each other. Efforts were made to procure the tetraploid wild species viz., *G. mustelinum* and *G. ekmanianum* from M/s. Rasi Seeds Pvt. Ltd. Attur, Tamil Nadu. The seeds of the both species were received at ICAR-CICR, Nagpur and are being established for further utilization in pre-breeding programme. Dr YG Prasad, Director, ICAR-CICR, Nagpur appreciated the efforts of Dr Vinita Gotmare and Dr HB Santosh in procuring these wild species and thanked Rasi Seeds for promptly sharing. He advised to explore these species for improvement of upland cotton through pre-breeding approaches



Dr. Vinita Gotmare receiving the newly arrived seeds of tetraploid wild species *G. mustelinum* and *G. ekmanianum* from Director, ICAR-CICR

CICR Happenings

Strengthening ICAR-CICR Regional Station, Coimbatore

Concerted efforts are being made to modernize the farm infrastructure in ICAR-CICR Regional Station, Coimbatore in order to tackle the emerging challenges in cotton cultivation. To give flip to mechanization of farm operations in-lieu of depleting farm bullock power and shortage of manpower, an array of farm machinery and farm implements like tractors, power tillers, pneumatic precision planter, reversible mould board plough, reversible disc plough, rotavators, boom sprayer, shredder, etc. were procured in the past few years. In order to achieve precision leveling of research fields, a laser land leveler was procured recently. To augment the water resource of the farm, two bore wells were re-drilled and deepened. For lighting, solar street lights were installed along the farm roads. To strengthen the security in New Area farm, CCTV network has been established and was made operational. Some of the facilities added recently are as follows:



Tractor (55 HP)



Mini Tractor (21 HP)



Pneumatic Precision Planter



Laser Land Leveler



Reversible Disc Plough



Reversible Mould Board Plough

CICR Happenings



Rotavator



Power Weeder



Boom Sprayer



Shredder



Drip Irrigation



CCTV Network at New Area Farm

Scientists' Corner

Publications, Awards, Recognitions and special assignments

- Verma P, Blaise D, Sheeba JA, Manikandan A (2021) Allelopathic potential and allelochemicals in different intercrops for weed management in rainfed cotton. *Current Science*, 120(6): 1035.
- Saravanan M, Misra RC, Mahajan SS, Patil DV, Waghmare VN (2021) Morphological and molecular characterization of desi cotton (*Gossypium herbaceum* L.) landraces collected from different states of India. *Electronic Journal of Plant Breeding*, 12(1):142-150.
- Prasad YG, Fand BB, Naik VCB (2021) Cotton IPM: Novel approaches and future strategies. In "Furtherance in Integrated Pest Management (IPM) approaches" ICAR-National Research Centre for Integrated Pest Management, New Delhi, pp161-167.
- Nalayini P, Sankaranarayanan K, Prakash AH (2021) Climate smart agro techniques for yield enhancement and sustainability of cotton-based system. In: *Physiological intervention for developing climate resilient commercial crops*" Gomathi R, Prakash AH, Ram B (Eds.) Published by International Books and Periodical Supply Service. (ISBN No.978-93-85267-27-7)

Participation of scientists in Training/seminar/conference/symposia/etc.

- ✓ **Dr. Y.G Prasad, Director, ICAR-CICR, Nagpur participated in the following meetings/events**
 - Review meeting (virtual) on Budget Utilization chaired by Secretary DARE and DG ICAR on March 5, 2021. Sr. Administrative Officer & I/c FAO also participated in the meeting.
 - 3rd Meeting (virtual) of the Committee to examine proposals for transfer/sale/purchase/change in name of GEAC approved Bt cotton hybrids, chaired by ADG (Seeds), ICAR on March 8, 2021.
 - XXVI Meeting (virtual) of ICAR Regional Committee – VI, Inaugural & Technical Sessions organized by ICAR-Central sheep & Wool Research Institute, Avikanagar from Krishi Bhawan, New Delhi on March 13, 2021.
 - 86th Meeting (virtual) of the Central Sub-Committee on Crop standards, Notification and Release of Varieties for Agricultural Crops on March 15, 2021 chaired by Deputy Director General (CS), ICAR.
 - meeting (virtual) for finalization of Breeder Seed Indent Kharif-2022 on March 16, 2021 organized by DAC&FW, Govt. of India.
 - Delivered a lead lecture on "Changing scenario of insect pests and diseases in Indian cotton ecosystem and critical issues in their management" in National Conference on Priorities in Crop Protection for Sustainable Agriculture held during March 16-18, 2021, jointly organized by CAU, Imphal and ICAR- NBAIR, Bengaluru.
 - Review Meeting of ICAR-Regional Committee-VII on March 25, 2021 organized by PME Cell, NBSS&LUP, Nagpur. Er. Gautam Majumdar also participated in the meeting.
 - Dr. Y.G Prasad, Director, ICAR-CICR, Nagpur, Scientists of Crop Protection Division, the coordinators of IRM project participated in the meeting to discuss IRM project proposal for 2021-22 on March 04, 2021.
- ✓ Dr. S, Manickam, Principal Scientist (Plant Breeding), ICAR-CICR RS and Member Secretary of Sub-group, presented the status paper in the meeting of sub-committee on ELS and Naturally Coloured Cotton on March 11, 2021.
- ✓ Dr. P. Nalayini, Principal scientist (Agronomy), CICR Regional Station, Coimbatore delivered an invited lead paper on "Prospects and potential of polyethylene mulching for doubling the yield of cotton-based systems in a changing climate" at the International Plant Physiology Virtual Symposium held during March 11-12, 2021 organized by Indian Society of Plant Physiology (ISPP), New Delhi, NAAS Chapter Coimbatore, SSRD-Coimbatore and SAU'S South Zone.
- ✓ Dr. Rishi Kumar, Principal Scientist (Entomology), ICAR-CICR, Regional Station, Sirsa attended (virtual mode) a Kisan Mela on March 22, 2021 organized by PAU, Bathinda for ensuing kharif crop season. He participated in the panel discussion on IPM in kharif crops and delivered a lecture on management of pink bollworm in cotton crop. More than 2500 farmers attended Kisan Mela.
- ✓ Dr. S. K. Sain, Principal Scientist (Plant Pathology), ICAR-CICR Regional Station, Sirsa participated in the National e-Conference on Plant Health and Food Security: Challenges and Opportunities" organized by Indian Phytopathological Society, IARI, New Delhi, during March 25-27, 2021 and presented (oral) a research paper "Diversity of the rhizosphere fungal community edifice of upland cotton in North India". The paper received the best oral presentation award.

Farmers' Corner

Hybrid seed production of CICR 2 brought prosperity to cotton farmers

Of the four cultivated species of cotton, Asiatic cotton (*Gossypium arboreum*) popularly referred as 'desi cotton' is indigenous in origin and possesses inherent ability to adapt to adverse climatic conditions. Desi cotton ruled the cotton area and production in India prior to independence. The American and Egyptian cottons were introduced to India in 1790 and 1831, respectively. The development of hybrid cotton since 1970's and commercial approval of Bt cotton since 2002 have provided major boost to upland cotton in India and adversely impacted desi cotton cultivation in India. But Desi cotton is still under cultivation in some part of India as farmers believe in the yield sustainability of desi cotton especially in marginal soils and under low management practices. There is a big demand for short staple and coarse desi cotton which is mostly used as surgical cotton due to its better absorption capacity and also in making denim. In cotton growing tracts of North India in Punjab, Haryana and Rajasthan, the desi cotton is planted during the month of April to early May after harvest of Wheat, Barley, Mustard and Gram. To cater to the need of these desi cotton farmers, ICAR- Central Institute for Cotton Research (CICR), Regional Station, Sirsa had developed and released a GMS based hybrid CICR 2 in 2005 for commercial cultivation in north zone comprising the states of Haryana, Punjab and Rajasthan. This hybrid was developed by crossing DS-5 (GMS) as female parent and LD 327 (Sel.) as male parent. It has erect plant type and grows up to 150 cm in fertile soils and gives better response to good crop management practices. With duration of 160 -170 days, the average yield potential of this hybrid can be up to 32.13 quintals/ha. This hybrid has fluffy boll opening and better locule retention. It possesses 2.5% span length of 20.5mm, micronaire value of 7.06, fibre strength of 16.3 and ginning outturn of 38.4%.



High yielding desi cotton hybrid CICR2



Shri. Raja Ram receiving the parental lines of CICR2 from Dr. S. K. Verma, Head (i/c), ICAR-CICR, Sirsa

The development of desi cotton hybrids using male sterile system eliminates the process of emasculation as the anthers born on the female parent are sterile thus leading to reduction in cost of hybrid seed production. However, pollination needs to be done manually. CICR has taken up 21 training programs from 2007 to 2018 to impart the skills required for hybrid seed production to more than 450 farmers. Shri. Raja Ram and Smt. Manju Rani from Begu, Sirsa, Haryana were one of the best beneficiaries the trainings imparted by ICAR-CICR and now they are prosperous seed producers of CICR 2. They have been producing hybrid seeds of CICR 2 since 2006. Initially they started producing seeds in 2 kanals (1000m² i.e., 1/8th of an acre) and produced 90 kg seeds which was sold for Rs.300/kg. With the ceaseless motivation and support of Scientists from ICAR-CICR, Sirsa they continued producing the hybrid seeds for last 16 years. They produced a total of 195 kg seed of this hybrid from an area of 1.25 acres in 2017 and sold to farmers of Fatehabad, Faridkot & Hanumangarh districts for Rs.1000/kg. During 2020, they produced 236 kg of CICR 2 from 1 acre area and sold them at Rs. 1000/kg to the farmers of Bathinda, Ferozepur, Sirsa, Hissar, Fatehabad, Bhiwani, Mahendergarh, Rewari, Charkhi Dadri & Hanumangarh. Over the years, they have produced over 30 quintals of CICR 2 and have distributed to the cotton farmers in districts of Sirsa, Hissar, Faridkot, Fatehabad, Hansi, Ludhiana, Rewari, Charkhi Dadri, Hanumangarh, Bhiwani and Sriganganagar in three states Punjab, Haryana and Rajasthan. Their testimony on hybrid seed production of CICR 2 is acting as one of the key motivating factors for other cotton growers in the region to take up hybrid seed production and continue to cultivate desi cotton.

Information provided by **Dr Debashis Paul, Dr Amarreet Singh and Dr S K Verma**

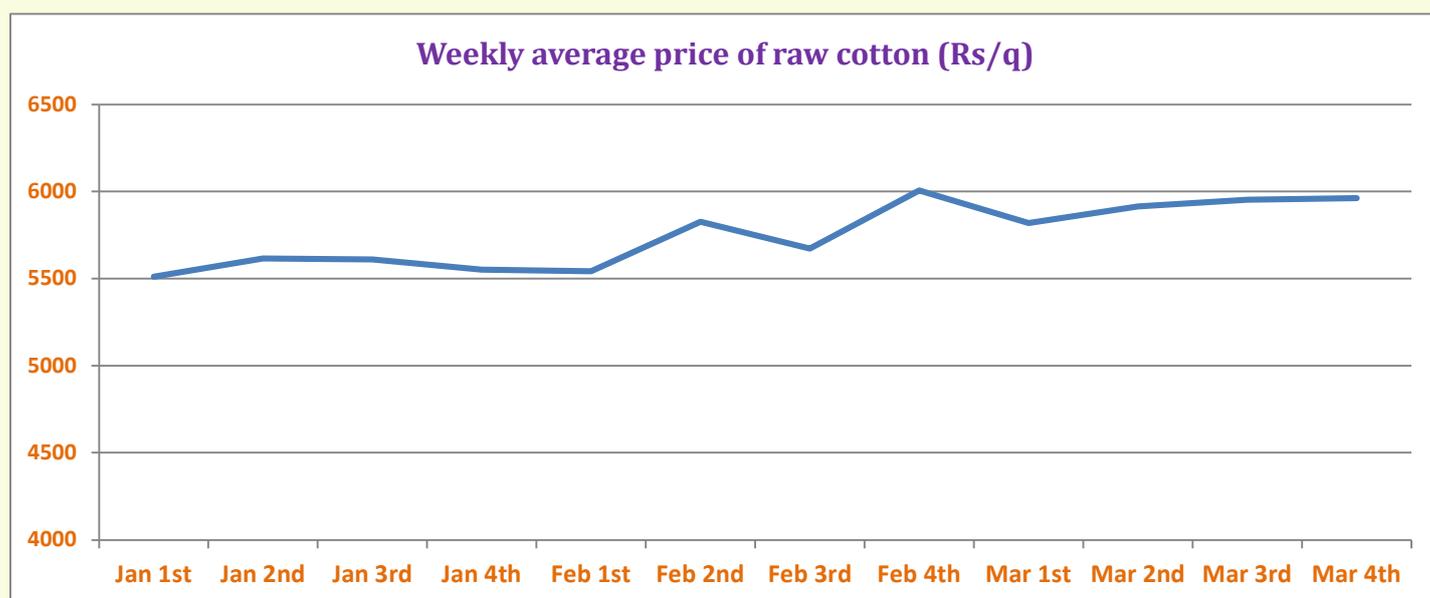
Cotton Statistics and Trade

Price scenario of raw cotton

Dr A R Reddy and Dr Isabella Agarwal

Indian scenario

The price of raw cotton in the markets was observed on the positive note. Raw cotton price, which was Rs.5512/q. in the first week of January showed a steady increase and reached to Rs. 6007/q by the end of last week of February. In the month of March, price of raw cotton was found to be between Rs. 5800 to 5950 per quintal.



International scenario

Cotlook's A Index climbed from 90 cents/lb one month ago to 99 cents/lb on 25th February. Since then, the A Index fell to 93 cents/lb. In international terms, the China Cotton Index (CC Index 3128B) increased from 110 to 117 cents/lb between early February and early March. More recently, the CC Index slipped to 115 cents/lb or 16,300 RMB/ton. Movement in Indian cotton prices (Shankar-6 quality) was more muted. In international terms, prices gained alongside NY/ICE futures, but the increase was only from 76 to 80 cents/lb. In domestic terms, values increased from 43,500 to 45,800 INR/candy and have not retreated from these levels.

Cotton Price indices in various countries (cents/lb)

Cents/lb	Latest Value (Mar 9)	Latest Month (Feb)
NY Nearby	84.3	86.5
A Index	93.6	92.8
CC Index	114.2	111.1
Indian Spot	80.5	77.9
Pakistani Spot	94.8	84.7

Price of BG II cotton hybrid seed is increased

As per Indian Gazette notification on 30th March 2021, there was increase in the maximum retail price (MRP) of Bollgard-2 (BG-II) to Rs. 767/packet from Rs. 730/packet of the previous year. The maximum retail price (MRP) of Bollgard (BG) seeds remained the same as Rs. 635/packet.

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Cotton Innovate | Volume 3(1), 2021
www.cicr.org.in



Produced and Published by Dr. Y. G. Prasad, Director,
ICAR-CICR, Nagpur

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Publication Note: Cotton Innovate is an Open Access
monthly newsletter of ICAR-CICR, Nagpur available online
at http://www.cicr.org.in/cotton_innovate.html

Published by

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Citation: Cotton Innovate 2021, ICAR-Central Institute for
Cotton Research, Nagpur, India, Volume: 03 (01), pp-16,
available at http://www.cicr.org.in/cotton_innovate.htm

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