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### From Director's Desk...

Globally, around 24 million metric tonnes of cotton is produced from about 32 million hectares. The Asian region is the largest hub for cotton production, trade and use. Together the countries in this region account for almost two third of area under cotton cultivation and more importantly they consume 77% of the global cotton produced. India,

China, Pakistan & Uzbekistan are the major cotton growing countries in the region where as China, India, Bangladesh, Pakistan, Vietnam and Indonesia are the major cotton consuming countries. The cotton value chain is a major employment generator and shapes the economy of several Asian countries. Asia is emerging as an undisputed hub of textile and garment industry accounting for 65% of total yarn production, around 70% of world fabric manufacture and 65% of apparel production.

Despite geographical and political diversity among the cotton growing countries of Asia, the nations have several similarities and face common challenges viz., predominance of small holder production systems, low level of mechanization, vulnerability to climate change/variability, rising production costs, pest resurgence to major pesticides, soil degradation, dwindling agro-biodiversity, more moisture & trash content and poor fibre quality, lack of appropriate ginning technology.

In order to foster the regional co-operation in Cotton Research amongst the Asian countries to tackle the challenges, the International Cotton Advisory Committee (ICAC) had established the Asian Cotton Research and Development Network (ACRDN) in 1999. So far six meetings of this Network have taken place in various countries of Asia namely Pakistan (1999), Uzbekistan (2002), India (2005), China (2008), Pakistan (2011), Bangladesh (2014). This year the ICAC has decided to organize the 7<sup>th</sup> ACRDN meeting at Nagpur in India. The theme of the network meeting is: PRODUCTION OF QUALITY FIBRE & DOUBLING COTTON FARMERS' INCOME

This meet provides an excellent opportunity for researchers across the globe in general and Asian countries in particular to assemble, interact and discuss the most recent innovations, trends, concerns, practical challenges encountered and solutions adopted in the field of cotton production, consumption, processing and trade. On behalf of the organizing committee, I take this opportunity to cordially invite you to participate in the 7<sup>th</sup> Asian Cotton Research and Development Network (ACRDN) meet.

Dr. P. G. Patil  
Director

## Special News

### Textile India - 2017

ICAR-CIRCOT participated in “Textile India-2017” mega event organized by Ministry of Textiles, Govt. of India at Gandhinagar, Gujarat from June 30, 2017 to July 2, 2017. The event was inaugurated by Shri. Narendra Modi, Hon'ble Prime Minister, Govt. of India on June 30, 2017.



**Hon'ble Prime Minister, Shri. Narendra Modi inaugurating “Textile India- 2017”**

An international conference on "Productivity and Product Diversification Challenges for Natural Fibers" was also organized as a part of the Mega Event “Textile India 2017” on July 2, 2017.



**Shri. Radha Mohan Singh, Hon'ble Union Minister for Agriculture and Farmers Welfare and Smt. Smriti Irani, Hon'ble Union Minister for Textiles and Dr. P. G. Patil, Director CIRCOT with other dignitaries on the Dias during the conference**



## Special News

Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture & Farmers Welfare, was the chief guest for the conference and in his address he stressed upon the importance of development of new technologies to improve the productivity of natural fibre crops for doubling farmer's income. Smt. Smriti Irani, Hon'ble Union Minister of Textiles, in her address has committed for creation of knowledge platform to harness the synergy of intellectuals in agriculture and textile ministries for mutual benefit to the farmers and industries.

Dr. P. G. Patil, Director ICAR-CIRCOT delivered his presentation on the topic "Enhancing productivity of Natural Fibres-Key issues and challenges" in the conference. Other noted speakers in the session included Mr. Dilip Tambyrajah, President, International Natural Fibre Organization, The Netherlands, Prof. Abdul Jabbar Khan of Bangladesh University of Engineering Technology, Dr. Li Long of Chinese Academy of Agriculture Sciences, China. ICAR-CIRCOT, Mumbai was the nodal institute for Conference session from Ministry of Agriculture and Farmers Welfare, Government of India.

ICAR-CIRCOT was the coordinating institute for arrangement of exhibition stalls of organizations dealing with cotton viz ICAR-CICR, Nagpur; SIMA, Coimbatore; Textile Committee, Mumbai and Cotton Corporation of India, Mumbai. Scientists Dr. A. S. M. Raja, Er. V. G. Arude, Dr. C. Sundaramoorthy, Sh. A. Arputharaj and Dr. Manoj Kumar along with Sh. Anand Jadhav, Senior Technical Assistant participated in the Event.



**Dr. P. G. Patil, Director, ICAR-CIRCOT delivering a lecture at the conference**



**ICAR- CIRCOT team along with staff of CCI, CAI, Textile Committee and SIMA at Textile India- 2017**

# SPECIAL NEWS



## Technology Insight

### Low temperature refining process for production of Nanofibrillated Cellulose

Nano Fibrillated Cellulose (NFC) is obtained from wood pulp by means of different mechanical production processes like refining, high pressure homogenization and friction grinding. Refining, being the simplest and well-established process, is widely adopted for the commercial production of NFC, but the major problem is heat generation during the refining process that leads to charring and colour change (white to grey) of the resultant product. To overcome this problem, low-temperature refining was used for production of NFC from cotton linters. Initially, cotton linters were kier boiled to remove lignin and wax, followed by bleaching process. Then, the material was beaten in a Hollander beater for 4h followed by refining in a tri-disc refiner attached with material recirculating system. To control the temperature rise during the processing, the material was cooled during the recirculation process using cold water or by jacketing with ice. The resultant product (NFC) was not charred and was in the size range of 150-200 nm when refined for 1-2 h. An XRD analysis confirmed that the crystallinity was maintained at 83% and was not affected by the high-intensive refining process.



Refining unit for production of Nano Cellulose

## Events

### Swachha Bharat Abhiyan

A cleanliness programme was conducted at Ghatkopar staff quarters on June 8, 2017 between 10 am to 1 pm. The terrace of Param quarters was cleaned by removing the waste pipes, unused wooden materials, other unwanted materials and handed over to the BMC staff for proper disposal. Thereafter cleaning was carried out at Karpasa staff quarters also, where the terrace was cleaned and unused material such as metal racks, rods, wooden materials etc. were arranged and kept properly. All the staff residing in the staff quarters along with the other institute staff members enthusiastically participated in the cleaning programme.



Cleaning the terrace of Param Staff Quarters, Ghatkopar under the Swachha Bharat Abhiyan

### A seminar on Safety Handling of Glassware

A seminar on 'Safety Handling of Glassware' was conducted on June 15, 2017 for the staff of Chemical and Biochemical Processing Division by M/s Borosil Glass Works Ltd. All scientific, technical, supporting, contractual staff and Ph. D. scholars of the division attended the seminar.

### International Yoga Day

International Yoga Day was celebrated on June 21, 2017 with active participation of all the staff members. Shri. Ambika Yoga Kutir, Thane, Ghatkopar branch were invited on the occasion to conduct the session as per the protocol prescribed by the AYUSH ministry.



## Events

### International Yoga Day

Dr. P. G. Patil, Director, speaking on the occasion, highlighted the importance of yoga for healthy living, general well-being, maintaining peace & harmony in the institute.



Dr. P. G. Patil, Director addressing the staff on International Yoga Day



Staff members actively participating in the International Yoga Day celebrations

### MGMG Programme: Awareness-cum-Demonstration on Production and Processing of Cotton

Ginning Training Centre, Nagpur conducted a one day awareness-cum-demonstration program on “Production and processing of cotton” at Majra village, Dist. Wardha on June 29, 2017. The expert team consisted of scientists Dr. R. Guruprasad, Dr. V. Mageshwaran and Er. Varsha Satankar and outside experts Dr. M. S. Kairon, Former Director, CICR, and Shri. G. H. Wairale, Former GM, Maharashtra Cotton Federation. Mr. Shyam Sundar Bhutda, Panchayat President coordinated the meeting attended by around 40 famers.

The farmers were made aware of the importance of clean and quality fibers in spinning and textile industries and the prospect to fetch premium prices for trash free cotton. Dr. M. S. Kairon detailed about the best management practices to improve cotton productivity, minimizing production cost and improving fibre quality. Shri. G. H. Wairale discussed about cotton marketing and informed that ginnerers are ready to pay Rs. 100/- extra for every one percent increase in ginning percentage over and above 34%. The avenues of additional remuneration by way of using the cotton stalks for preparation of compost & cultivation of mushroom were demonstrated to the farmers.



Experts team along with farmers at Gram Panchayat, Majra, Wardha



CIRCOT scientists interacting with the farmers at Majra Village, Wardha as part of the Mera Gaon Mera Gaurav program



## Visits

### Director's Visits

- Dr. P. G. Patil, Director, attended a meeting held under the chairmanship of Dr. T. Mohapatra, Secretary, DARE & DG, ICAR, New Delhi with officials of Ministry of Finance and other stakeholders to discuss the way forward for refining and commercializing the technology for manufacturing pulp to make currency grade paper in NASC Complex on June 8, 2017.
- Dr. P. G. Patil, Director, along with Dr. S.N. Jha ADG (PE), ICAR, Dr. Sujata Saxena Principal Scientist, ICAR-CIRCOT and Dr. Virendra Prasad, Sr. Scientist, ICAR-CIRCOT visited Security Paper Mill (SPM), Hoshangabad (M.P.) on June 29, 2017. The purpose of visit was to explore the possibilities of taking trials for preparation of pulp using CIRCOT Technology. The team inspected pulp making machines and also visited paper testing facility of SPM. Further, detailed discussion about future course of action with the team of officials lead by Mr. T. R. Gowda, General Manager, SPM was held.

The committee scrutinized the Indian Standards due for revision as well as adopted some ISO standards. Dr. T. Senthil Kumar, Scientist, CIRCOT was inducted as alternate member representing the Institute.

### Planning Meeting of the QRT 2012-17

The planning meeting of the Quinquennial Review Team (QRT), which was constituted to assess the performance of ICAR-CIRCOT for the period 2012-17, was held on June 28, 2017. Dr. N. C. Patel, Vice Chancellor, Anand Agricultural University and Chairman, QRT presided over the meeting. The other QRT members present in the meeting are Dr. G. R. Anap, Dr. V. D. Gotmare, Dr. N. J. Thakur and Dr. M. K. Sharma. The meeting was attended by Dr. S. N. Jha, ADG (PE), ICAR, New Delhi, Dr. P. G. Patil, Director, Heads of Divisions, SAO and AF & AO. Dr. P. G. Patil welcomed the members and presented overall achievements of the institute for the review period. After discussion, planning of various activities of QRT were chalked out. Dr. Sujata Saxena, Member Secretary QRT, coordinated the meeting.

## Meetings

### BIS Sectional Committee on Physical Methods of Tests

The 17<sup>th</sup> meeting of BIS Sectional Committee on Physical Methods of Tests (TX01) was held on June 2, 2017 under the Chairmanship of Dr. P. G. Patil, Director, ICAR-CIRCOT. The meeting was attended by the members representing industry and research institutes. Dr. P. K. Mandhyan, Senior Scientist attended the meeting as the principal member representing the Institute.



Planning meeting of the QRT in progress on June 28, 2017



## Meetings



QRT members visiting various facilities at the institute



Dr. P. S. Deshmukh in a TV talk show *Krishi Darshan* of DD Sahyadri (Marathi)

### Management Review Meeting of ISO 9001:2008

A Management Review Meeting of ISO 9001:2008 was held on June 23, 2017. The meeting was attended by the Management Committee members and Internal auditors for the feedback on the internal audit conducted on May 11 & 12, 2017 and assess the institute's preparedness on implementation of ISO 9001:2015.

### TV Talk on DD Sahyadri

Dr. P. S. Deshmukh, Senior Scientist, participated in a TV talk show '*Krishi Darshan*' hosted by DD Sahyadri, to discuss on '*Scientific Cottonseed Processing*'. The show was broadcasted on June 29, 2017 at 6.10 p.m. The deliberation covered the aspects of conventional method of cottonseed processing, misconceptions about un-decorticated cottonseed cake products and the need for scientific cottonseed processing, its benefit and the impact on the country's economy.

### Workshop

#### Workshop on Cotton Cultivation and Post-Harvest Technology

Ginning Training Centre in collaboration with M/s Bayers Crop Sciences conducted a workshop on '*Cotton Cultivation and Post-Harvest Technology*' at Umred, Nagpur and Anji, Wardha on June 3 and 6, 2017 respectively. Dr. V. Mageshwaran, Scientist from Ginning Training Centre, Nagpur participated in the workshop. He stressed upon the importance of quality based marketing of cotton and suggested the farmers to choose cotton variety for sowing, after assessing its quality and yield. He disseminated the information on utilization of cotton stalks for preparation of value-added products like pellets, briquettes and compost to the farmers for generating additional income. A large group of farmers, representatives from ginning industries, ATMA and APMC attended the program. Mr. Sharad Ramekar from M/s Bayers Crop Sciences helped in successful conduct of the programs.



## Workshop



**Dr. Mageshwaran addressing the gathering during workshop on Cotton Cultivation and Post-Harvest Technology at APMC, Umred on June 3, 2017**

### Hindi Workshop on Karyalayin Kamkaj Evam Patrachar

One day Hindi workshop on “Karyalayin Kamkaj Evam Patrachar” was organized on June 17, 2017 by Hindi cell in Jubilee Hall for the scientific, technical and administrative staff of the institute. Seventy nine staff members attended the workshop. The lecture was delivered by Dr. Mahendra Jain, Professor, Hindi Shikshan Yojana, Belapur, Navi Mumbai.



**Hindi Workshop on Karyalayin Kamkaj Evam Patrachar on June 17, 2017**

## Awareness Programme

### Farmers' Awareness Programme at Karmala, Solapur

An awareness programme on 'Selection of Cottonseed and Cultivation Method' was jointly organized by ICAR-CIRCOT and Dhansmruti Group of industries at Vijay Nagar-Zare Fata, Karmala on June 18, 2017.

Dr. S. V. Ghadge & Dr. P. S. Deshmukh, Senior Scientists represented the institute. Sh. Sanjay Pawar, Tehsildar, Karmala, Sh. P. S. Patil, Cotton Expert; Dr. Telang, Cotton Entomologist from CRS, Nanded were present on the occasion. The other stakeholders present included representatives from seed, fertilizer, soil testing and services sectors.

The farmers were made aware of the importance of cotton quality in the value chain, optimum utilization of resources during cultivation, clean cotton picking practices, utilization of by-products of cotton plant. On this occasion, ICAR-CIRCOT had arranged an exhibition stall highlighting oil processing technologies and provided guidance to the participating farmers. Sale of seeds and soil testing services were also organized for the benefit of cotton farmers.



**Sh. Sanjay Pawar, Tehsildar, Karmala and others visiting ICAR-CIRCOT exhibition stall at Karmala, Solapur on June 18, 2017**





## Participation in Seminars/Conferences/Meetings

1. Er. V. G. Arude, Scientist & Head In-charge, MPD and Dr. P. S. Deshmukh, Senior Scientist, TTD, attended a meeting on "Cotton Mechanisation in India" organized by John Deere India Pvt. Ltd. at Hotel Leela, Mumbai on June 8, 2017. The focus of the meeting was to discuss mechanisation in India and factors impacting the whole value chain. Er. V. G. Arude made presentations on "Cotton Mechanisation in India" and "Cleaning and Ginning of Mechanically Harvested Cotton". The meeting was attended by different stakeholders including Bayer Crop Science, Carver Technologies, Arvind Mills, Lummus Corporation, etc.
3. Dr. A. S. M. Raja, Senior Scientist and Dr. Manoj Kumar, Scientist attended a road show on "Textiles India -2017" organised by the Office of the Textile Commissioner at Hotel JW Marriott, Sahar, Near International Airport, Mumbai on June 12, 2017.
4. Dr. A. S. M. Raja, Senior Scientist and Shri R. R. Chhagani, ACTO attended a seminar on 'Color Fastness to Light & the importance of Standards in Textiles' organised by QLab, C-Therm, TexanLab & Venture Technologies on June 16, 2017 at Mumbai.

## Publications

Mandhyan, P. K., Nachane, R. P., Banerjee, S., Pawar, B. R. and Koli, H. S. - Nonlinear Maxwell modelling of inverse relaxation in yarns and fabrics, *Indian Journal of Fibre and Textile Research* Vol. 42, June 2017, pp. 168-174.

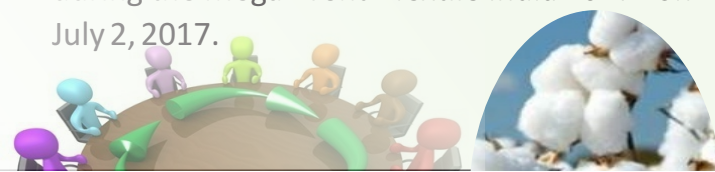
Raja, A. S. M., Arputharaj, A., Saxena, S. and Patil, P. G. - Single bath enzymatic scouring and bleaching process for preparation of absorbent cotton, *Indian Journal of Fibre and Textile Research* Vol. 42, June 2017, pp. 202-208.

Basak, S., Samanta, K. K., Chattopadhyay, S. K., Saxena, S. and Parmar, M. S. - Self-extinguishable cellulosic textile from *Spinacia oleracea*, *Indian Journal of Fibre and Textile Research*, Vol. 42, June 2017, pp. 215-222.

Mageshwaran, V. and Gaonkar, P. V. - Biological Treatment of Banana Pseudostem Fibre: Effect on Softening and Mechanical Properties, *International Journal of Current Microbiology and Applied Sciences*, ISSN: 2319-7706, Vol. 6 (5) May 2017, pp. 1268-1274.



2. Dr. P. G. Patil, Director and scientists Dr. A. S. M. Raja, Er. V. G. Arude, Dr. C. Sundaramoorthy, Shri A. Arputharaj and Dr. Manoj Kumar attended the International Conference on "Productivity and Product Diversification Challenges for Natural Fibers" organized during the Mega Event "Textile India 2017" on July 2, 2017.



## Personnel

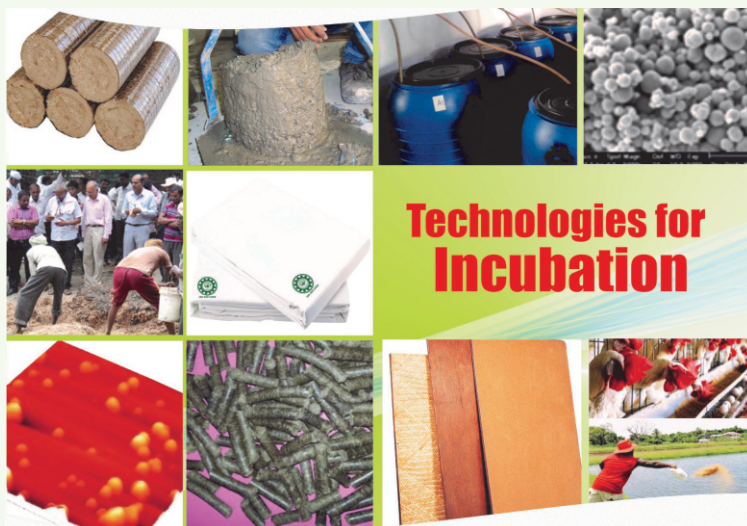
### Obituary

The institute deeply mourned the sad demise of Shri. M. K. Ghadge, Skilled Support Staff, Mechanical Processing Division, who expired on June 15, 2017, while still in service. All CIRCOT fraternity prayed for peace to the departed soul in condolence meet. Dr. P. G. Patil, Director mentioned about his dedicated and honest service record and assured of all possible help to the family members of the deceased.

## Agri-Business Incubation

### Technologies Available for Incubation at the ICAR-CIRCOT ABI Centre

- 1) Ecofriendly preparation of absorbent cotton for medical & hygiene products.
- 2) Nanofinishing Technologies for Cotton Textiles
  - a) Antimicrobial
  - b) UV protection
  - c) Water repellency
- 3) Cotton rich blends for functional textile applications
- 4) Innovation Finishing processes for garments & home textiles: Mosquito repellent, pesticide protection cloths & denim fading
- 5) Software module for non-metameric color matching in textiles
- 6) CIRCOT Calibration Cotton for global outreach
- 7) Sustainable business model for cotton at village level:
  - a) Quality based trading
  - b) Supply chain logistics for cotton stalk (custom hiring)
  - c) Value addition to cotton biomass
  - d) CIRCOT mini card for sliver preparation
- 8) Microbial Degossypolisation cottonseed meal for use as feed in poultry, fish & piggery sectors
- 9) Enhancing farmers and other stakeholders income by Cotton value chain: via startup & entrepreneurship development
- 10) Cotton Trading based on Quality Parameters for better price remuneration by Farmers



## Upcoming Events

### Calendar of training cum-skill development programmes for the year 2017-18

S.No.	Title of Training	Period	Fees (Rs) (excluding Service tax)
1	Value addition to Cottonseed	20-22 July 2017	12, 000
2	Absorbent Cotton Technology	02-04 Aug., 2017	15, 000
3	Advances in Applications of Nanotechnology	11-15 Sept., 2017	25,000
4	Quality Evaluation & Spinning performance of Indian Cottons using Advanced Techniques	20-22 Sept., 2017	10,000
5	Spinning of Technical Yarn	05-07 Oct., 2017	10,000
6	Basic & advanced Statistical Techniques for Research	15-17 Nov., 2017	8,000
7	Characterization of Materials Using X-Ray Diffractometer (XRD)	19-21 Dec., 2017	30,000
8	Basic and Advanced Techniques for Evaluation of Textile Materials	04-06 Jan., 2018	10, 000
	Advances in Microscopy	16-18 Jan., 2018	15, 000
9	Electrospinning Technologies & their Applications	23-25 Jan., 2018	10,000
10	Fibre Reinforced Composite	07-09 Feb., 2018	10,000
11	Quality Evaluation of Cotton	24-28 July, 2017 07-11 Aug., 2017 11-15 Sept., 2017 23-28 Oct., 2017 20-24 Nov., 2017 29 Jan.-. 2 Feb, 2018 19-23 Feb., 2018	10,000
13	Double Roller Ginning Technology & Basics of Cotton Grading, GTC, Nagpur	10-15 July, 2017 07-12 Aug., 2017 18-23 Sept. 2017 09-14 Oct., 2017 13-18 Nov., 2017 18-23 Dec., 2017 15-20 Jan., 2018 12-17 Feb.,2018	10,000
12		10,000	
13	Customized training programme for students & academia*	Two days (Dates can be finalized as per the requirement)	2,000
14	Customized training programme for students & academia*	One day (Dates can be finalized as per the requirement)	1,000



### Contact detail

Er. A. K. Bharimalla,  
Senior Scientist & Head In-charge, TTD  
ICAR-Central Institute for Research on Cotton Technology, Adenwala Road,  
Matunga (E)  
Mumbai-400019.  
Email: [bpd.circot@gmail.com](mailto:bpd.circot@gmail.com);  
Ph: 022-24127273, Fax: 02224130835, Mob: 9702878249  
Details are available at our Website: [www.circot.res.in](http://www.circot.res.in)



### ADDRESS FOR CORRESPONDENCE **The Director**

ICAR-Central Institute for Research on Cotton Technology  
DARE, Ministry of Agriculture, Govt. of India  
Adenwala Road, Matunga (E), Mumbai – 400 019  
Ph: 022 - 24127273/76; Fax: 022 – 24157239  
e-mail: [icarcircot.news@gmail.com](mailto:icarcircot.news@gmail.com)  
[www.circot.res.in](http://www.circot.res.in)

