

A Monthly Insight into the ICAR-CIRCOT

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e - News Letter

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Director's Desk...

Cotton has long been known as nature's unique food and fibre plant. It produces both food for man and feed for animals in addition to a highly versatile fibre for clothing, home furnishing and industrial uses.

ICAR-CIRCOT is a premier institute conducting research in the frontier areas of technologies for the betterment of cotton produces and consumers. Cottonseed is an important byproduct of cotton crop forming about 2/3rd portion of the seed cotton. It is rich in oil and protein and hence is a source of edible oil and feed for livestock. It is the third largest contributor to vegetable oils in India being the only oilseed in the country having a production of more than one tonnes. As India is net importer of edible oil, the improvement in process efficiency of cottonseed oil extraction needs urgent attention.

In addition to oil, cottonseed is also a source of other useful products like linters, hulls and meal or cake. All these products can be obtained from cottonseed by processing it in a scientific manner which involves delinting and dehulling of cottonseeds prior to oil extraction. However most of the cottonseed in our country is being directly crushed for oil. By non-adoption of scientific processing, the country is losing about 7 lakh tonnes of oil, 4 lakh tonnes of linters, 27 lakh tonnes of hulls and 0.8 lakh tonnes of soap stock of worth Rs. 6000 crores every year. It is important to fully utilize all cottonseed products to make cotton cultivation more remunerative.

(Dr.P.G.Patil)

Cotton Lint Opener for Micronaire Testing Inaugurated

CIRCOT-PRECISION COTTON LINT OPENER was formally launched on August 08, 2016 at Nagpur by the ASRB ex-chairman Dr. C. D. Mayee in the presence of CIRCOT Director Dr. P. G. Patil, CEO of Precision Tooling Engineers Mr K.G. Bhatt, CICR Director Dr. K. R. Kranthi, CEO of Bajaj Steel Industries Mr. M. K. Sharma, CEO of Bhagirath Textiles Mr Rajiv Dubey, general manager of Maharashtra Cotton Federation Mr. J. P. Mahajan, President CIS laboratory Mr. Rahul Bharatwal, Scientist investigators Dr. S. V. Ghadge and Dr. S. K Shukla and the staff from GTC Nagpur.

Cotton lint opener opens up the samples drawn from densely packed bales require for fibre quality assessment. Generally, human labour is employed to open the lint manually, which is not just tedious but also unscientific with the possibility of incorrect valuation of fibre quality.

The machine addresses the technology gap that long existed in fibre fineness testing laboratories where, in absence of right kind of equipment, trash analyser has been widely used for opening of cotton lint samples.



ASRB ex-chairman Dr. C. D. Mayee and Director Dr. P. G. Patil while launching cotton lint opener

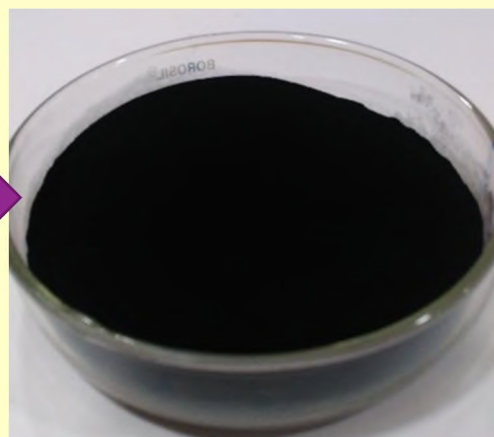
Technology Developed to Prepare Activated Carbon from Cotton Stalks

Technology has been developed to prepare activated carbon from cotton stalks. This helps to enhance the mesoporosity of the carbon required for various applications including filtration. Cotton stalks were dried and carbonized at temperatures varying from 300 to 900 °C for activation time of 1h. Dried cotton stalk was also impregnated with phosphoric acid for a period of 24h. The acid was decanted and biomass was carbonized in a muffle furnace in

absence of air at 500°C for 1h for activation. Both raw and acid modified cotton stalk activated carbon samples were crushed and sieved using 170 mesh (BSS) screen to obtain uniform particle size of adsorbents. Mesoporosity of both raw and acid modified carbons were analyzed by methylene blue adsorption test. It was found that raw cotton based activated carbon had mesoporosity not exceeding 25 mg/g and acid modified cotton stalks carbon about 140 mg/g.



Cotton Stalk



Cotton Stalk based Activated Carbon

Trainings

Specialized Training on Value Addition to Cottonseed

Four days training programme on Value Addition to cottonseed was organized at ICAR- CIRCOT during 29th Aug-1st September, 2016. Four industry personnel from the states of Karnataka, Maharashtra and Gujarat and four students from Institute of Chemical

Technology, Mumbai participated in the training programme. Participants were appraised about the modern scientific methods for processing this important by product of cotton cultivation to realize its full potential and various technologies developed by the institute for further

value addition. Participants were introduced to various analytical methods for determination of important parameters of cottonseed and its

products and demonstrations on various value addition technologies were also conducted.



Group Photo of trainees who attended training on "Value Addition to Cottonseed" held at CIRCOT, Mumbai.

Training on Double Roller Ginning Technology and Cotton Quality Evaluation

CIRCOT is a pioneer in conducting specialized training programmes catering to the needs of cotton processing industries, to ginners and fitters in particular. In this line, a one-week training programme on double roller ginning technology and cotton quality evaluation was organized at GTC, Nagpur during August 22–27, 2016. Ten participants from ginning industries located in Maharashtra attended the

programme. The training program dealt with the cotton fibre quality assessment, grading, marketing, ginning technology, export and by-products utilization. Practical hands-on training was imparted on how to measure cotton fibre length manually. Demonstration of cotton stalk particle board making and scientific cottonseed processing plants were arranged. Trainees were also taken for industrial exposé visits.



Trainees while doing hands-on practical training on manual cotton stapling at GTC, Nagpur

Events

ISO Audit

The Bureau of Indian Standards (BIS) conducted the mandatory surveillance audit for ISO 9001:2008 accreditation during August 16-17, 2016. Team leader Mr. Sanjay Vij and an expert Mr. G. P. Kanchi conducted an audit in the MR and top management, chemical and biochemical processing division (CBPD), administration and PME/TI cell. The

auditors expressed satisfaction over the functioning of quality management system of CIRCOT as per ISO 9001:2008. The director informed that the institute would opt for ISO 9001:2015 during the renewal of current accreditation. Dr. A. S. M. Raja and Mr. A. Arputhraj were appreciated for their efforts in maintaining the QMS.

Mera Gaon Mera Gaurav Activities

Technology Demonstration cum Awareness Programme

A one day awareness cum demonstration programme was organized in Digras

village of Selu taluk in Wardha District on August 4, 2016 with the aim to identify the

problems facing farmers and to demonstrate Institute technologies to improve their livelihoods. About twenty farmers attended the programme. Institute Scientists explained about the use of biofertilizers for improving soil fertility and better crop production, demonstrated the conversion of waste cotton into lamp stick

through video clippings. The utilization of cotton stalks for energy generation for rural and industrial applications. The team consists of Dr. V. Mageshwaran, Er. G. T. V. Pabu and Er. Varsha Satankar also interacted with farmers in the field and recommended better crop residue management practices.



CIRCOT scientists giving demonstrations to farmers during Mera Gaon Mera Gaurav programme on August 4, 2016

Production and Post-Harvest Processing of Cotton

A one day farmers awareness programme was conducted in Sawali (Wagh) village of Wardha district of Maharashtra on August 19, 2016. The programme received huge response from villagers where more than about 80 farmers participated. Sarpanch of the village explained the major agricultural

activities going on in the village as well as the problems faced by the farmers. Scientists briefed the farmers about the farmer friendly cotton post-harvest processing technologies and farmer centric activities conducted at CIRCOT, information on crop production and protection and suggested curative

measures for crop protection from insect and pest attacks. Farmers were advised for appropriate management practices for weed control, fertilizer application, disease and pest control. The importance of the utilization of cotton byproduct and preparation of briquettes, pellets and compost from cotton stalks, better

management practices for clean cotton picking for realization of better prices were also briefed during programme. Scientists Er. V. G. Arude, Dr. S. K. Shukla, Dr. A. R. Raju, Mrs. Kapanla Kapse Sarpanch and Mr. G. H. Wairale participated in the programme.



Field interaction with progressive farmers at Sawali village on August 19, 2016.

Technology Transfer (MoU)

Ms. Pratima Uke of Green Globe, Mumbai has been inducted as an incubatee in the Agri Business Incubation (ABI) Centre of the Institute on August 17, 2016. The focus will be on launching a new product "Antimicrobial Cotton Bed Sheets" that uses CIRCOT technology of in-situ nano-zinc

oxide (ZnO) preparation. The product is targeted for use in hospitals, hotels, railways, hostel and also in homes. It helps to avoid cross-contamination due to its antimicrobial property. Test marketing of the product is underway for which antimicrobial cotton bed sheets have been handed over to Ms. Uke.



Director Dr. P. G. Patil handing over antimicrobial cotton bed sheets to an ABI incubatee Ms. Pratima Uke of Green Globe, Mumbai for test marketing.

Visits

Visits of SAARC Delegates to GTC, Nagpur

As part of the regional coordinated cotton exchange programme, a group of eight SAARC delegates from Bangladesh, Nepal, Pakistan, Afghanistan and Bhutan visited Nagpur to participate in the regional consultancy meeting arranged by SAARC Agriculture Centre (SAC) and ICAR-Central Institute for Cotton Research, Nagpur during August 28-30, 2016. The main objective of the meeting was sustainable

development of cotton sector of the member nations for rural poverty alleviation through sharing research knowledge and technologies in the field of cotton production and processing and devising a future strategy for cotton improvement. CIRCOT technologies and demonstration facilities including testing laboratories were showcased to the delegates during their visit to GTC, Nagpur on 31st August, 2016.

Delegates also interacted with GTC scientists and explored the possibilities of undertaking coordinated research work for mutual benefits of farmers and stakeholders.



SAARC delegates from Bangladesh, Nepal, Pakistan, Afghanistan and Bhutan at GTC, Nagpur.



SAARC delegates in fibre testing laboratory at GTC, Nagpur.

Visits of Director, CIRCOT to GTC Nagpur

Dr. P. G. Patil, Director, CIRCOT in his address to GTC staff assured that hard work and sincerity would be acknowledged and rewarded and he would provide all possible administrative, technical and financial assistance for their research and training

activities. At the last, the Director visited all the Demonstration plants and fibre testing laboratory of GTC staff and given valuable instructions for improvement in training, testing, and research work.

MP farmers visit GTC Nagpur

A group of farmers from Betul, Madhya Pradesh visited GTC, Nagpur on 29th August, 2016. The visit was organized under the Chief Minister Khetra Tirtha Yatra programme. GTC scientist gave

demonstration on the technologies for mushroom production, composting of cotton stalks for additional remuneration, cotton stalk particle board and pellet making facilities for the benefit of farmers.



Farmers from Madhya Pradesh at GTC, Nagpur on August 29, 2016

Meetings

Dr. Shukla participated in SAARC meeting

Dr. S. K. Shukla, officer-in-charge of GTC Nagpur participated in the SAARC regional consultancy meeting organized under the aegis of regional coordinated cotton exchange programme at ICAR-CICR, Nagpur on August 29, 2016, He

presented a paper on 'ginning and post-harvest technologies–status and issues' and highlighted the advancement in ginning and allied machinery sector in India that may be useful to other SAARC nation.

Director's Meetings

Dr. P. G. Patil, Director CIRCOT attended a meeting chaired by Shri Chhabilendra Roul, Additional Secretary, DARE & Secretary, ICAR on August 16-17, 2016 at CIFE Mumbai. The

meeting was conducted in connection with implementation of the ERP systems and installation of the solar systems in ICAR Institutes.

Workshops

Hindi Workshop

A one day Hindi workshop on "Vyavharik Hindi" for technical officers of the Institute was organized on August 20, 2016. Shri Sunjay Nigam, Former Chief Marketing Manager of Dena Bank

and Dr. Mahendra Jain, Professor of Hindi teaching scheme delivered lectures on the implementation of Hindi language. Eleven technical officers participated in the workshop.

Seminars & Conferences

- i. Dr. A. S. M. Raja, Senior Scientist presented research paper on development of low temperature process for preparation of absorbent/bleached cotton for industrial application at the 3rd international "Indutech 2016" organized by PSG College of

Technology, Coimbatore during August 26-27, 2016.

- ii. Shri A. Arputharaj, Scientist chaired the technical session at the 3rd international conference "Indutech 2016" organized by PSG College of Technology, Coimbatore during August 26-27, 2016.

He also presented a research papers on “Development of atmospheric pressure plasma assisted process for denim materials” and “Development of low temperature process for preparation of absorbent/bleached cotton for industrial application”

- iii. Shri G Krishna Prasad, Scientist presented a research paper on biological

treatment of polyamide reinforcements for improving the interfacial adhesion of rubber composites at the 3rd International “Indutech 2016” organized by PSG College of Technology, Coimbatore during August 26-27, 2016.

Trainings and Workshops Attended

- i. Smt. S. D. Dudam, Private Secretary to the Director attended a training programme on enhancing efficiency and behavioral skills at NAARM, Hyderabad during July 28 – August 3, 2016.
- ii. Shri Sharad Kokane, Guest House & Security in-charge attended competence enhancement programme on hospitality management at NAARM, Hyderabad during August 10-12, 2016.

Patent Granted

A patent on “A process for the preparation of cellulose nanoparticles using the fungus *Trichoderma reesei*” invented by Senior Scientist Dr. N.

Vigneshwaran and ACTO Dr. A. A. Kathe has been granted on August 24, 2016 (Patent No. 275149).

Publications

- i. G. T. V. Prabu, S. K. Chattopadhyay, P. G. Patil, A. Arputharaj, P. K. Mandhyan, G. K. Prasad, M. V. Vivekanandan, G. B. Hadge, N. Vigneshwaran, (2016), “Moisture management finish on cotton fabric by electrospraying” *Textile Research Journal*, August 26, 2016, doi: 10.1177/0040517516665262. (NAAS Rating 7.60)
- ii. P. Satyamurthy, P. Jain, V. S. Karande, N. Vigneshwaran, (2016) “Nanocellulose induces cellulase production in *Trichoderma reesei*” *Process Biochemistry*, <http://dx.doi.org/10.1016/j.procbio.2016.06.016>. (NAAS Rating 8.52)

- iii. A. Arputharaj, V. Prasad, S. Saxena, N. Vigneshwaran, S. R. Shukla (2016), "Ionic liquid mediated application of nano zinc oxide on cotton fabric for multi-functional properties", The Journal of The Textile Institute, DOI: 10.1080/00405000.2016.1222984 (NAAS Rating 6.72)
- iv. V. Prasad, A. Arputharaj, A. K. Bharimalla, P. G. Patil, N. Vigneshwaran (2016), "Durable multifunctional finishing of cotton fabrics by insitu synthesis of nano-ZnO", Applied Surface Science, Accepted for publication (NAAS Rating 8.71)
- v. S. Periyasamy, G. Krishna Prasad, S. K. Chattopadhyay, A. S. M. Raja, K. Raj Kumar, and S. Jagadate (2016) "Micro-roughening of polyamide fabric using protease enzyme for improving adhesion strength of rubber-polyamide composite" J. Polymer Engg. 2016 (accepted for publication (NAAS rating 6.47).

Personnel

Smt. K. R. Joshi, Senior Technical Officer of official language cell retired on 31st August, 2016.

Agri-Business Incubation

Technology Available for Incubation at the ABI Centre of ICAR-CIRCOT

- Synthesis of Nano-Zinc Oxide Particle by Novel Chemical route
- Energy Efficient Nanocellulose Production Technology
- CIRCOT's Accelerated Processing of Cotton Stalk for manufacture of Compost
- Gossypol reduction and nutritive quality improvement in cottonseed cake for its use in non-ruminants feed
- Design and development of Textile through Computerized Sampling Facility with CAD
- Process for preparation of Absorbent Cotton
- Briquetting and Pelleting of Cotton Stalk

Upcoming Events

Training-cum-skill development programmes for 2016-17

Sr. No.	Title of the Training Programme	Period	Fee (Rs) (excluding service tax)
1	Quality Evaluation & Spinning performance of Indian Cottons using Advanced Techniques	Sep 20-22, 2016	10, 000
2	Fibre and Yarn Quality Management in Spinning	Oct 5-7, 2016	10, 000
3	Basic Statistical Techniques for Textile Research	Nov 15-17, 2016	6, 000
4	Training on Absorbent Cotton Technology	Nov 21-23, 2016	10, 000
5	Characterization of Materials Using X-Ray Diffractometer (XRD)	Dec 19-21, 2016	30, 000
6	Advances in Microscopy	Jan 16-18, 2017	15, 000
7	Advances in Applications of Nanotechnology	Feb 6-10, 2017	25, 000
8	Spectroscopic and Chromatographic Techniques for Material Characterization	Feb 21-24, 2017	15, 000
9	Instrumental Evaluation of Clothing Comfort	Mar 6-10, 2017	50, 000
10	Quality Evaluation of Cotton	Sep 19-23, 2016 Nov 7-11, 2016 Jan 9-13, 2017 Feb 20-24, 2017	10, 000
11	Double Roller Ginning Technology & Basics of Cotton Grading, GTC, Nagpur	Sep 19-24, 2016 Oct 17-22, 2016 Nov 21-26, 2016 Dec 19-24, 2016 Jan 16-21, 2017 Feb 20-25, 2017	10, 000
12	Synthesis and Characterization of Nanomaterials for Agricultural Applications	Sep 19-28, 2016	ICAR short course

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