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# ICAR-CIRCOT , e-Newsletter

## Director's desk.....

### Dear Esteemed Readers,

*ICAR-CIRCOT is implementing the Cotton Technical Assistance Programme (Cotton TAP) for Africa that has been designed to augment the capabilities and potential in the cotton value chain and strengthen the competitiveness of the sector in the selected African countries. Africa is emerging as one of the desired destinations for Cotton and millions of people in Africa depend on this crop for their livelihood. Cotton plays a predominant role in the export as well as GDP of the Cotton-4 countries (Benin, Burkina Faso, Chad, and Mali), Nigeria, Malawi & Uganda and the sectors progress has direct influence on these economies performance. Under the auspices of the 2<sup>nd</sup> India- Africa Forum Summit (IAFS), this initiative with a goal of "strengthening constituents of cotton value chain in Africa through enhanced capabilities of engaged stakeholders" has been conceptualized to provide Cotton Development Assistance.*



*The In-country training programmes at Uganda and Malawi were successfully completed during this month. CIRCOT scientists shared their experiences with participants in the training. Similar In-country training programmes are to be organized in the countries viz Benin, Burkina Faso, Chad, Mali and Nigeria.*

*In this month institute has organized specialized training programme on "Cottonseed: Scientific processing and value addition" which has received good response from industry. Our institute in collaboration with Indian Fibre Society (IFS), Mumbai had organized National interactive workshop on "Textile Education and Employment opportunities" for the benefit of students' community from textile faculty. "National Communal Harmony Week - Flag Day" was also observed in the institute. I take this opportunity to congratulate the medal winners in the ICAR west zonal sports meet-2014 held at Jodhpur.*

*A training on Nanotechnology is going to be conducted during 8-12 December, 2014 at ICAR-CIRCOT, Mumbai. This training will provide proper insight to the trainees in the field of Nanotechnology. I wish full success both organisers and participators.*

**With best wishes**  
**Dr. P. G. Patil**  
**Director**

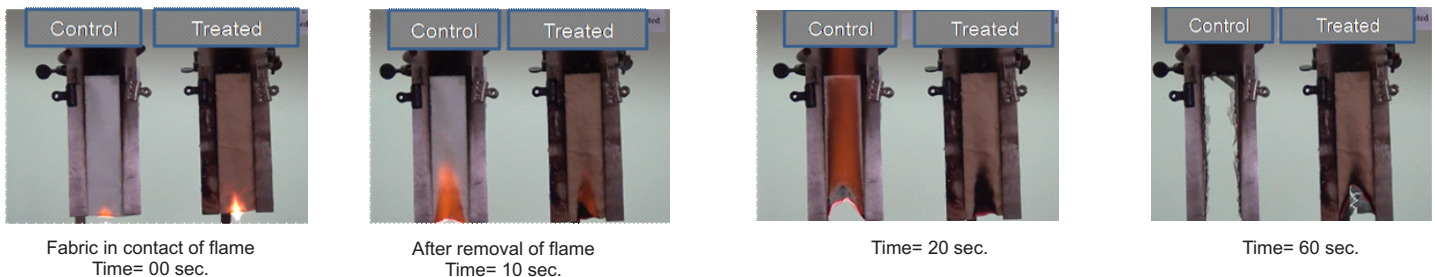
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# 1. Technology Highlights

## (i). Flame retardant cellulosic textiles using natural extracts

Flame resistance of textiles is one of the important functionalities of textile materials especially for apparel and home textiles. Cellulosic textiles resistance towards flame is very poor due to their inherent nature. In the current scenario, most of the chemicals used for fire retardant finishing of cotton textiles are synthetic compounds which are hazardous, non-ecofriendly, and non-biodegradable. In this regard an eco-friendly natural flame retardant finish has been prepared from the banana pseudo stem sap for textile application. The extracted sap was padded to the pre-mordanted bleached and mercerized cotton fabrics. Fire retardant properties of the control and treated fabrics were analyzed in terms of Limiting oxygen index (LOI), Horizontal and vertical flammability. The data obtained showed that the treated cotton fabrics have good fire retardant property and high colour uptake compared to the control cotton fabrics. Limited oxygen index value of the treated cotton fabric was 30 against the 18 for control cotton fabric. As far the vertical flammability is concerned, treated sample showed no flame and flame propagation rate was 7.5mm/min which was almost 10 times lower than the control fabric. From thermo gravimetric analysis it was deduced that the applied banana pseudostem sap reduces the combustion temperature of the cellulosic substrate



**Comparison of the vertical burning behaviour of the control and the banana pseudostem sap treated cotton fabric**

## (ii) Low temperature process for the preparation of absorbent cotton

Absorbent cotton is used for absorbing human body fluids and finds its major application in hospitals. Important chemical processes involved in the preparation of absorbent cotton are scouring and bleaching. Conventionally, scouring of raw cotton fibre is done using sodium hydroxide at 115°C under 15 psi pressure in the kier machine and the bleaching is carried out using hydrogen peroxide at 95°C. These processes are energy intensive and not eco-friendly due to effluent related issues. A process for the preparation of absorbent cotton at low temperature has been developed using binary enzyme combination and activated hydrogen peroxide bleaching techniques. The process consists of treating the raw cotton with a combination of enzymes at 65°C instead of conventional sodium hydroxide treatment at high temperature and pressure. The enzyme scoured cotton is then subjected to activated peroxide bleaching at 65°C to remove the residual colour. The absorbent cotton produced through the developed process satisfies the IP standards. The absorbency of the cotton fibre is less than 10 seconds, and the sulphated ash is also less than 0.5%. Most of the absorbent cotton industries in our country are small and medium scale in nature. Hence, the development of low temperature process for the preparation of absorbent cotton will benefit them in terms of reduced energy cost.

## 2. Training

### (i) Training on 'Double Roller Ginning and Cotton Quality Evaluation'

Ginning Training Centre (GTC) of ICAR-CIRCOT, Nagpur organized a training programme on 'Double Roller Ginning and Cotton Quality Evaluation' during Nov 10-15, 2014 for cotton ginners, traders and gin managers. Trainees from different parts of Maharashtra participated in this programme. A series of in-house and guest lectures on different aspects of cotton quality assessment, grading, cotton marketing, by-product utilization etc. were arranged during the training programme. Hands on training on gin settings, automation, stapling of cotton, etc. were also given. Trainees were taken to M/s. Shri Bhagirath Textiles Ltd, Kalmeswar, Nagpur and M/s. Bajaj Steel Industries Ltd, Nagpur as part of industrial visit. Dr. S. K. Shukla, Sr. Scientist and Officer In-charge, GTC, was course coordinator of this training programme.



Dr. S. K. Shukla is distributing the certificates to the participants

### (ii) Training on Cottonseed: Scientific processing and Value-addition

A five days training on “Cottonseed: Scientific processing and Value-addition” was conducted at CIRCOT during 10–14 November, 2014. Dr. S. Sreenivasan, Former Director, CIRCOT inaugurated the program as chief guest. The training focused on scientific processing and diversified uses of cottonseed, value addition to cottonseed for economic prosperity and to impart knowledge of analytical methods for cottonseed analysis. Trainees from Maharashtra, Gujarat and Tamilnadu participated in the programme. The training program covered topics such as scientific processing of cottonseed, cottonseed products and its uses, analysis of cottonseed, Value-addition to cottonseed by fermentation technology, Economics and Business perspective on value addition to cottonseed. Dr. S. Saxena Senior Scientist, I/C Head, CBPD was the course director and Er. A. K. Bharimalla, Senior Scientist, I/C Head, TTD, Dr. V. Mageshwaran Scientist, CBPD & A. Arputharaj Scientist, TTD were the course co ordinators of the training.



Director CIRCOT and faculty members with the trainees

### (iii) On-Farm Training programme on Clean Cotton Picking organized

An on-farm awareness cum training programme on clean cotton picking was organized at cotton field of Shri Rajaram - a well known progressive farmer in Sirsa district- at village Begu, Sirsa (Haryana) on 10.10.2014 and 1.11.2014. . The cotton pickers were provided with cotton picking aids viz. Headgears, Sheets, Bags and Tarpaulins etc.



They were made aware of menace of trash and contamination and their subsequent impact on end use products. They were given training on and demonstrated how they can reduce trash content in cotton and pick contaminant free cotton. They were also delivered detailed instructions on storage and transportation of cotton. An exhibition of commonly found contaminants in cotton was also displayed in field for awareness of cotton pickers and nearby farmers.



Dr. Hamid Hasan during On-farm training on Clean Cotton Picking

#### **(iv) Cotton TAP for Africa: In Country Training Programme on “Post-harvest Management of Cotton and Value Addition to Cottonseed and Crop Residues” conducted at Uganda and Malawi under Cotton TAP.**

CIRCOT conducted “In- country training programme on Post-harvest Management of Cotton and Value Addition to Cottonseed and Crop Residues” at Uganda and Malawi under Technical Assistance Programme (TAP) for development of cotton sector in African countries. It was implemented as per Second Africa-India Forum Summit (AIFS). A group of 25 professionals from Uganda and 21 professionals from Malawi from different organizations engaged in development of cotton sector viz., government and private sector, policy makers, production technologists, scientists, entrepreneurs were trained. Training cum workshop was conducted during 12-16, Nov, 2014 at Cotton Development Organization, Kampala, Uganda and during 17-19, Nov, 2014 at Bvumbwe Agricultural Research Station, Blantyre, Malawi. CIRCOT scientists shared their experiences with participants from Uganda and Malawi about the various aspects of cotton technology suitable for African countries, viz. appropriate technologies for the cotton ginning, importance of cotton quality assessment, value addition to cottonseed and crop residues for preparation of value added products viz. briquettes, pellets, compost, particle boards, etc. The participants were also given hands on experience training at the ginning and cottonseed oil extraction industries. The field visits were also arranged in order to give industrial exposure to the participants. Dr. P. G. Patil, Director, Er. A. K. Bharimalla, Senior Scientist and Er. V. G. Arude, Scientist from CIRCOT, Mumbai conducted and coordinated the programme at Uganda and Malawi.



ICAR-CIRCOT Team with delegates of Uganda at Cotton Development Organization, Kampala

### **3. Events**

#### **(i) Brainstorming on “Scientific processing of cottonseed” at ICAR-CIRCOT (Innovation cell activity)**

Innovation Cell of CIRCOT organized the Brainstorming session on “Scientific processing of cottonseed” on 5<sup>th</sup> November, 2014 at Dr. V. Sundaram Committee Room of CIRCOT. The objective of this programme was to have discussion among scientists, machinery manufacturers & cotton seed crushing industries personnel, to identify the problems faced in popularization of scientific cottonseed processing and find the ways & means to overcome this problems. There were twenty-six participants attended the programme including scientists, academicians, cottonseed processors, officials of All India Cottonseed Crushers Association. The session began with the welcome address by Dr. P.G. Patil, Director, CIRCOT. The session was chaired by Dr. S. Srinivasan Former Director, CIRCOT and co-chaired by Dr. A.J. Shaikh, Emeritus scientist and Former Director, CIRCOT. Dr. V. Mageshwaran, Scientist, CBPD

The researchable issues brought out were enhanced recovery of linters and oil, control of aflatoxin and free fatty acids during storage, gossypol-free edible protein, proper effluent treatment system for cottonseed oil processing industries etc. The policy issues brought out were efforts to bring cottonseed under oilseed commodity and to increase the proportion of scientific seed crushing from 5% to 15%. The meeting was ended with vote-of-thanks by Dr. Sujata Saxena, Head, CBPD, ICAR-CIRCOT.



Deliberations on Scientific Cottonseed processing

## **(ii) Second Advisory Committee meeting of Basic funded project on “Biodegradable Electrospun Fibre Mat for use in packaging of perishable agricultural materials”**

The Second Advisory Committee meeting of the Basic fund project on “Biodegradable Electrospun Fibre Mat for use in packaging of perishable agricultural materials” was held on 8<sup>th</sup> November, 2014 at Dr. V. Sundaram Committee room of CIRCOT. The meeting was presided by the chairman of the advisory committee Dr. Gopa Kumar, Former DDG (Fisheries), in the presence of Dr. S. Sreenivasan, Member of the advisory committee and Dr. P. G. Patil, Director, CIRCOT and Dr. S. K. Chattopadhyay, Head In-Charge, MPD. Welcome address was delivered by Dr. P. G. Patil, Director, followed by the release of the publication “Electro spinning Facility at CIRCOT”. With the initial introductory remarks from the committee members, the progress of the project was presented by Er. G. T. V. Prabu Scientist, MPD & P. I. of the project. Progress of the project was appreciated by the advisory committee members. The meeting was concluded with the vote of thanks and visit to the Electro Spinning Lab and the facilities created in the project.



Release of the publication “Electro spinning Facility at CIRCOT”

## **(iv) MoU with M/s Zenith Industrial Rubber Products Pvt. Ltd., signed**

Under a subproject of National Agricultural Innovation Project (NAIP) entitled “Design and development of rubber dams for watersheds” implemented by consortium comprising of Directorate of Water Management (DWM), Bhubaneswar, Central Institute for Research on Cotton Technology (CIRCOT), Indian Rubber Manufacturers Research Association (IRMRA), Mumbai and Kusumgar Corporates Private Limited (KCPL), Mumbai, a Technology for manufacturing & Installation of “ICAR flexi check dams” for the effective watershed management and efficient use of water in Agriculture has been developed. To commercialize the developed technology, a Memorandum of Understanding has been signed on non-exclusive basis to manufacture and sell the “Textile Reinforced Rubber Composite Sheets” with M/s Zenith Industrial Rubber Products Pvt. Ltd., Mumbai on 3<sup>rd</sup> November, 2014 at ICAR-CIRCOT.



Signing of MoU with M/s Zenith Industrial Rubber Products

#### (iv) National Communal Harmony Week & Flag Day at ICAR-CIRCOT

National Communal Harmony Week was observed in the CIRCOT, Mumbai during 19<sup>th</sup> November to 25<sup>th</sup> November 2014. All the employees of CIRCOT took the pledge on 19<sup>th</sup> November to resolve all their difference through dialogue and constitutional means without resorting to violence and to maintain communal harmony in the institute. On 25<sup>th</sup> November Dr. Chandrakant Puri, Chair Professor, Rajiv Gandhi Centre for Contemporary Studies, University of Mumbai delivered a special lecture on Communal Harmony. Flag Day was also observed on 25<sup>th</sup> November and all CIRCOT employees contributed for the National Foundation for Communal Harmony fund.



Dr. Chandrakant Puri is felicitated by Director, CIRCOT

#### (v) ICAR West Zone Sports Tournament-2014 at CAZRI, Jodhpur

A team of 60 staff members of CIRCOT participated in the ICAR West Zone Sports Tournament-2014 held at ICAR-Central Arid Zone Research Institute, Jodhpur during November 20-24, 2014. Sixteen ICAR institutes of West Zone with 527 participants took part in various events during the meet.

**The following were the winners from CIRCOT in various categories in the sports meet.**

S. No.	Name of the Winners	Event	Prize
1	Smt. S.P. Paiyala	Table Tennis- Doubles	Gold
2	Smt. V. N. Walzade	Table Tennis- Doubles	Gold
3	Smt. S.P. Paiyala	Table Tennis- Single	Gold
4	Smt. S.P. Paiyala	Badminton - Doubles	Gold
5	Smt. H.R. Pednekar	Badminton- Doubles	Gold
6	Dr. R.D. Nagarkar	Table Tennis- Men's Team	Gold
7	Shri P.V. Jadhav	Table Tennis- Men's Team	Gold
8	Shri M.G. Ambare	Table Tennis- Men's Team	Gold
9	Shri H.S. Koli	Table Tennis- Men's Team	Gold
10	Shri M.M. Kadam	Table Tennis- Men's Team	Gold
11	Smt. H.R. Pednekar	200 m. Running	Silver
12	Smt. Kiran Joshi	Chess	Silver
13	Smt. H.R. Pednekar	100 m. Running	Bronze
14	Smt. H.R. Pednekar	Chess	Bronze
15	Smt. V.N. Walzade	Long Jump	Bronze
16	Smt. S.P. Paiyala	Javelin Throw	Bronze



Dr. S. K. Dey, Senior Scientist, QEID and Shri Manoj Ambare, Senior Technical assistant, CBPD were Chef De Mission and Assistant Manager of the sports group respectively.



Medal winners with Director, CIRCOT

#### **(vi) National interactive Workshop on “Textile Education and Employment opportunities” organized**

CIRCOT in collaboration with Indian Fibre Society (IFS), Mumbai organized National interactive workshop on “Textile Education and Employment opportunities” on Nov 29<sup>th</sup>, 2014 at Mumbai. This workshop was inaugurated by Dr. G. S. Nadigar, Former Director Textiles Committee & Textile consultant in the presence of Dr. S. P. Yavalkar Deputy Director, Directorate of Technical Education, Maharashtra. Dr. P. G. Patil Director, CIRCOT welcomed the participants of the workshop. Eminent personalities from industry, academic & research institutions delivered lectures on various topics. About 200 delegates including 130 students participated in the workshop. Prof. S. R. Shukla, Former Registrar, ICT, Mumbai chaired the technical session I in which lectures were given on apparel merchandising, soft skills and textile management. Dr. S. Sreenivasan, Former Director, CIRCOT, Mumbai chaired the technical session II in which deliberations were made on the topics such as home furnishing, textile research etc. Mr. Ulhas Nimkar, CEO, NimkarTek Textile services pvt. Ltd delivered lecture on present scenario of textile processing, emerging areas vis a vis job opportunities in textile sector.

#### **4. Visit of Afghan delegation to ICAR CIRCOT**

An Afghan delegation comprising of two ginner and six cotton extension officers visited, CIRCOT, Mumbai along with Dr. M. S. Kairon, Former Director, CICR on 24th November, 2014. Dr. P. G. Patil, Director, CIRCOT welcomed the delegates and presented the significant research achievements of the Institute. The visitors were taken to different laboratories of institute to explain the research facility available in CIRCOT. The Afghan delegates showed interest in the utilization of cotton stalks for manufacture of briquettes, pellets and also in scientific processing of cottonseed. Afghan delegation also visited, GTC of CIRCOT, Nagpur on Nov 19, 2014. Dr. S. K. Shukla, Sr. Scientist and Officer In-charge explained in detail about the training courses offered by CIRCOT at Nagpur and Mumbai and demonstrated the ginning technologies that can be useful for Afghanistan.



Afghanistan delegates with Director, CIRCOT



## 5. Seminars / Workshop / Meeting attended

### (I) National Symposium on “Plant Disease Management for Food Security”

Dr. P. G. Patil, Director, CIRCOT attended National Symposium on “Plant Disease Management for Food Security” during 9-11, November, 2014 organized by Association of Plant Pathologist, Nagpur in association with Indian Society for Cotton Improvement (ISCI) at Nagpur. He presented a paper titled, "Impact of Ginning and Fibre Attributes on Mechanical Processing of Cotton" and also took part in the deliberations at the Symposium.

### (ii) TAI conference on "Indian Textiles -The way Forward”

Dr. S. K. Chattopadhyay, Principal scientist I/C Head MPD, Dr. N. Shanmugam, Sr. Scientist I/C Head QEID attended the conference on "Indian Textiles -The way Forward" organized by Textile Association (India) held on 14<sup>th</sup> November 2014 at Mumbai.

### (iii) International Conference on “Technical Textile and Nonwoven”

Shri G. Krishna Prasad, Scientist, MPD participated and presented a paper titled “Effect of plasma treatment on peel strength of rubber coated nylon fabric” in the International Conference on “Technical Textile and Nonwoven” (ICTN 2014) organized at IIT, Delhi during 6 - 8 November, 2014.

## 6. Human Resource Development

Dr. S. Venkatakrishnan, CTO attended a Model training Programme on “Value addition through product diversification on Jute & allied fibres” during 10-17, November 2014, organized by ICAR-NIRJAFT, Kolkata. This training was sponsored by Directorate of Extension, Department of Agriculture & co-operation, Ministry of agriculture, Government of India.

## 7. Personnel

➤ Dr. Kartick Kumar Samanta, Scientist, Textile Chemistry was transferred to ICAR-NIRJAFT, Kolkata w.e.f 24.11.2014

➤ **The following Scientists of ICAR-CIRCOT got promotion in the next higher grade:**

1. Dr. N. Vigneshwaran, Sr. Scientist (Microbiology), next higher grade Rs. 9000/-, w.e.f. 10.09.2013
2. Shree V. G. Arude, Scientist (Farm Machinery & Power), next higher grade Rs. 9000/-, w.e.f. 21.05.2013
3. Er. Ashok Kumar Bharimalla, Scientist (Farm Machinery & Power), next higher grade Rs. 8000/-, w.e.f. 14.09.2012
4. Dr. Mageshwaran V., Scientist (Microbiology), next higher grade Rs. 7000/-, w.e.f. 04.11.2013

## 8. Up coming events

The following specialized training programmes are scheduled during the financial year 2014-15.

S. No.	Name of the training	Duration
1	Basics of Nanotechnology & its Application	Dec.08-12, 2014
2	Training on Cotton Spinning	Jan.05-09, 2015
3	Advances in Microscopy (SEM, AFM, Fluorescent & Polarised)	Jan.19-21, 2015
4	Chemical Characterization of Textile Materials & Auxiliaries	Feb. 02-06, 2015

## 9. Facilities available at CIRCOT for the mechanical processing of cotton

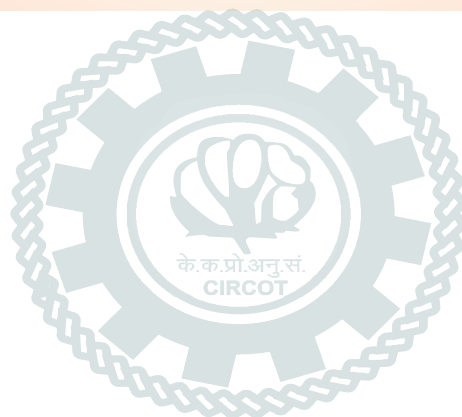


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