



GAS CHROMATOGRAPHY

ELECTROSPINNING

XRD ANALYSIS

PLASMA CHAMBER

## A Monthly Insight into the ICAR-CIRCOT

### e - News Letter

APRIL 2015, Vol.2. No.1

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#### Published by:

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Er. A.K. Bharimalla

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Dr. T. Senthilkumar



#### Director's Desk...

Indian cotton output in 2014-15 is expected to be 39 million bales as per recent CAB estimates. The acreage under cotton increased to 12.97 million hectares in 2014-15 as against 11.96 million hectares in 2013-14. Despite the increased acreage, the lower cotton production was primarily due to delayed monsoon resulting in delayed sowing and also from erratic rains in parts of the country. Cotton exports from India are expected to fall by 41 per cent over 2013-14 to around 7 million (five-year low) bales (1 bale=170 kg) in the 2014-15 season. As exports account for a substantial share of India's production of cotton, the decline in exports has resulted in a surplus for the domestic market and has impacted the cotton growers. Cotton Corporation of India has undertaken large scale MSP operations in all cotton growing states owing to the lower market prices for cotton.

Indian cotton is priced at 65 cents per pound as against 75 cents in the international market, there is a good chance to enhance exports. But the import demand of China, which used to account for 60 percent of India's exports, are not encouraging. China dominates the world cotton market as it's the world's largest producer (28%), consumer (35%), importer (42%) and holds largest world stocks (61%). In the recent past, Chinese cotton crop was moving into the reserve system created by the Chinese Government and the Chinese mills imported cotton to meet their demand. China is now reforming its cotton sector, where the cotton grown in china will be able to flow from farm to the mills without passing through the reserve system. With ample supply in the Chinese domestic market, the import demand from china in world market seems uncertain.

For safeguarding the interests of cotton growers in general and disposal of cotton to be procured under the MSP operations, new avenues has to be explored in the cotton deficit countries like Bangladesh, Vietnam, Indonesia, Turkey and Thailand for export of cotton and stabilizing cotton prices in India.

P.G. Patil  
Director



# ICAR-CIRCOT, Mumbai



## Technology Insight

### *Composites from waste fibrous material*

A novel composite material using un-shredded waste newspaper and polyester resin has been developed hand lay-up method. Small size holes were created in the paper by piercing to facilitate the resin flow throughout the paper. The first coat of the resin formulation was 2% accelerator and 2% catalyst based on the weight of the resin was smeared on the polyester sheet kept over a smooth steel plate. Thereafter, three layers of paper were placed on the top of resin coated polyester sheet and then again resin was applied on the top of the paper layer using a brush. Then smooth steel roller was used to even out the resin, remove excess resin and any entrapped air in the resin. The above process was repeated until the desired thickness has been achieved. After the final layer of paper is laid, it was covered with a polyester sheet, and a flat, smooth steel plate was placed on the top. Then the fabricated composite was allowed for the required time (30 min) by applying three different pressures viz. 5 kg/cm<sup>2</sup>, 35 kg/cm<sup>2</sup> and 55 kg/cm<sup>2</sup> on the mould. The same condition was followed for composite prepared with three different fibre percentage viz. 25%, 33%, and 48% respectively. After removal from the mould the composites were cured at 70° C for 2 hour. Properties of the newspaper were characterized by chemical, XRD and tensile strength analysis. It was observed that 48% (w/w) fibre content paper composite material have 70 MPa tensile strength and 6 GPa modulus along fibre direction.

## Training

### *Training program on Double Roller Ginning Technology and Cotton Quality Evaluation*

The Ginning Training Centre (GTC) organizes training program on recent advances in cotton ginning, quality evaluation and by-products utilization for the benefits of ginners, traders,

budding entrepreneurs and farmers. In this line, GTC organized a week training program on “Double Roller Ginning Technology and Cotton Quality Evaluation” during April 20-25, 2015. There were seven potential and budding entrepreneurs attended the programme. The programme modules dealt with fibre quality assessment, cotton grading, DR ginning technology, cotton export and cotton by-products utilization. The programme commenced with introduction of cotton ginning scenario in India and the opportunities available by Dr. S.K. Shukla, Officer In-charge, GTC. The session covered practical aspects like beater and fixed knife settings, automation and humidification in ginning system. The trainees were taught for fibre quality parameters such as fibre length, strength, fineness and maturity. The trainees were demonstrated on functioning of particle board and scientific cottonseed processing units. The trainees were taken for industrial visits to M/S Bajaj steel Industry Ltd. & M/S Sri Bhagirath Textiles Ltd. Dr. M.S. Kairon, former Director, ICAR-CICR, Nagpur distributed certificates to the trainees upon successful completion of the programme.



Group photo of trainees with Dr. M. S. Kairon, former Director ICAR-CICR, Nagpur

## Meetings

### 1) Meeting for upgradation of QEU's, Coimbatore

A meeting of Scientists and Technical Officers of the Institute was conducted on 6<sup>th</sup> April 2015 under the chairmanship of Dr. P. G. Patil, Director, CIRCOT for the upgradation of Quality Evaluation Unit, at Coimbatore. Dr. S. Sreenivasan and Dr. A. J. Shaikh, former Directors attended the meeting as Invitees. Dr. P.G.Patil welcomed the gathering and briefed the interest shown by Dr. K. Alagusundaram, DDG (Engg), to strengthen the Coimbatore Regional Unit. Dr. S. Venkatakrisnan, Chief Technical Officer, presented the genesis as well as the present activities of the Unit. Brainstorming was done to gather ideas on the potential scope for expansion of the research activity in the Coimbatore centre. Detail report for upgradation of QEID unit Coimbatore is under preparation.



Brainstorming session for upgradation of QEU's, Coimbatore

### 2) Nano cellulose pilot plant Review meeting

The tenth review meeting of sub-committee on erection and commissioning of nanocellulose pilot plant was held on 6<sup>th</sup> April 2015 at 3.00 pm in the Nanocellulose Pilot Plant. The meeting was chaired by Dr. P.G. Patil, Director, ICAR-CIRCOT, in the presence of expert committee members, Dr. S. Sreenivasan and Dr. A. J. Shaikh, former Directors of CIRCOT. The committee inspected the site and reviewed the actual work done during the reporting period. Er. A. K. Bharimalla,

Head, TTD briefed all the progress made in the pilot plant as against the earlier suggestions of previous review meeting of sub-committee and expert committee.



Inspection of expert committee members on erection and commissioning of nanocellulose pilot plant

### 3) AICRP on Cotton Annual Group Meeting

Dr. P. G. Patil, Director, ICAR-CIRCOT, attended Annual Group Meeting of AICRP on Cotton (2014-15), held at Tamil Nadu Agricultural University, Coimbatore during 8-10<sup>th</sup> April, 2015. Dr. N. Shanmugam, Head In-charge, QEID, Dr. P. K. Mandhyan, Sr. Scientist, QEID, Dr. S. Venkatkrishanan, CTO, Shri R. S. Prabhudesai, ACTO, Shri R. K. Jadhav, ACTO attended the meeting representing CIRCOT. Dr. P.G. Patil attended Central Cotton Variety Identification Committee meeting as an "Expert Member" nominated by ICAR.

### 4) Research Advisory Committee Meeting

The XXI Research Advisory Committee (RAC) was held on 17-18<sup>th</sup> April, 2015 to review the progress of work during 2014-15. The meeting was Chaired by Dr. P.R. Roy, and Members of the RAC, Dr. G.S. Nadiger, Textile & Management Consultant, Thane, Mumbai and Dr. (Smt.) Niyati Bhattacharya, former Head, Department of Textiles, SNTD Women's University, Mumbai and Dr. Kanchan K. Singh, ADG (Engg.), ICAR, New Delhi attended the meeting. Dr. S. Sreenivasan and Dr. A.J. Shaikh, former Directors were the Invitees. Research progress of different division were presented by HOD's. A Publication titled "CIRCOT at a Glance" was released by Dr. P.R. Roy. There was also a discussion on CRP



on natural fibres and CIRCOT vision 2050 in the meeting. The chairman and committee members visited the Nanocellulose pilot plant and Electrospinning facility newly created in the institute.



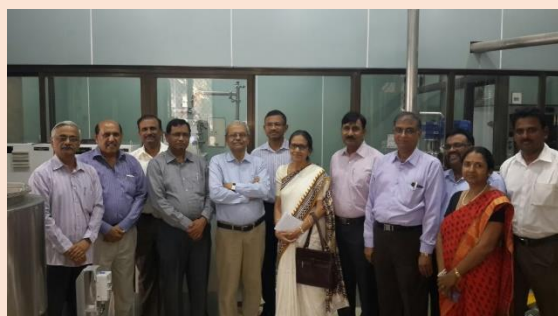
Dr. P.R. Roy releasing brochure 'CIRCOT at a Glance' in presence of Dr. Kanchan Singh, ADG (Engg)



Dr. P.G. Patil, Director, Presenting the CIRCOT Progress and Institute activities



Er. G. T. V. Prabu, Scientist, CIRCOT demonstrate the Electrospinning Laboratory to RAC Chairman and members



RAC Chairman and Members at Nanocellulose pilot plant

## 5) Results Framework Document Meeting

A meeting of Results Framework Document (RFD) committee was held on 22<sup>nd</sup> April, 2015. The meeting was chaired by Dr. P. G. Patil, Director, ICAR-CIRCOT. Er.V.G. Arude, Nodal officer-RFD, made presentation on RFD and accordingly after thorough discussion, Annual Performance Evaluation Report of RFD 2014-2015 was prepared. Technologies to be reported under RFD and the draft RFD 2015-2016 was also finalised. Meeting was attended by all HoD's, Co-Nodal Officer, RFD, Assistant Finance and Accounts Officer (A.F & A.O).

## 6) Institute Research Council (IRC) Meeting

The One Hundred and Fifteenth Institute Research Council (IRC) Meeting was held on 27<sup>th</sup> April, 2015 at the Seminar Hall to monitor the progress of research carried out during 2014-15 and to discuss new project proposals. The meeting was chaired by Dr. P.G. Patil, Director, ICAR-CIRCOT and attended by all the HOD's, Scientists and Technical Officers. Dr. K. R. Kranthi, Director ICAR-CICR, Nagpur, Dr. S. Sreenivasan and Dr. A.J. Shaikh, former Directors, ICAR-CIRCOT attended the meeting as the subject matter specialists. Er. V.G. Arude, Scientist, MPD, presented the Results Framework Document (RFD) for 2015-16.



Research Project discussion during IRC Meeting



Dr. P. G. Patil, Director welcoming to Dr. K. R. Kranthi, Director, ICAR-CICR, Nagpur as special invitees during IRC meeting

## 7) Meeting of Bureau of Indian Standards

Dr. Sujata Saxena, Sr. Scientist & In-charge CBPD attended the Sectional committee meeting of Bureau of Indian Standards at BIS Head Quarter, New Delhi on 24<sup>th</sup> April, 2015.

## 8) Town Official Language Implementation Committee (TOLIC) Meeting

Dr. P.G. Patil, Director, CIRCOT, Shri. Sunil Kumar, Administrative Officer, CIRCOT, and Mrs. Kiran Joshi, Sr. Technical Officer (O.L.) attended the meeting for smooth functioning on official language (Hindi) and matters related to Act 3(3) of official language organised by the Town Official Language Implementation Committee (TOLIC), Western Railway, Church gate, Mumbai on 30<sup>th</sup> April, 2015.



Dr. P. G. Patil, Director, CIRCOT and Shri Sunil Kumar, A.O, CIRCOT Participated TOLIC Meeting

## Seminar/Conference/Workshop

(i) Dr. P. G. Patil, Director, ICAR-CIRCOT participated in the workshop on **"Making Engineering Scientists contribution more**

**meaningful to stake holders and the nation"** organised by Subject Matter Division (Engg) on 13<sup>th</sup> April, 2015 at NASC Complex, New Delhi. The workshop was chaired by Dr. S. Ayyappan, DG (ICAR), and attended by DDG (Engg), DDG (Horticulture), DDG (NRM), DDG (Animal Science) and Engineering Scientist working in ICAR system. During the workshop farm machinery interventions (Current & Future trends), Post-harvest processing, Technologies for Cotton, Jute & other natural fibres were discussed. This was followed by a presentation on Engineering success stories by the National Director, NAIP. The open house session discussed on further points viz. Current Research Needs, Our strength and weaknesses, problem faced, ways to improve upon the system, outsourcing needs and successes. Director, CIRCOT stressed upon following areas related to the institute

- (i) Preparation of currency grade paper and pulp
- (ii) Development of ginning and cleaning system for mechanically harvested cotton
- (iii) Scientific cottonseed crushing to realise the by-products like linter, hulls, DOC and oil
- (iv) Value addition to cotton biomass through briquetting and pelleting for rural/industrial applications.

(ii) Dr. N. Shanmugam, Head In-charge, QEID and Dr. P. K. Madhyaan, Sr. Scientist, QEID – Presented a paper on "Inverse Relaxation in Polymeric Materials - Special Reference to Textiles". at Fourth International Conference on Natural Polymers and Biomaterials (ICNP 2015) Organized by IUMSE, Mahatma Gandhi University, Kottayam, Kerala on 10-12<sup>th</sup> April, 2015.



## Lectures

### (1) Lecture on “Food for Health ”

A lecture was delivered on “Food for Health” by Dr. R. T. Patil, Former Director, ICAR-CIPHET, Ludhiana and Director, Technocrats Institute of Technology, Bhopal on 7<sup>th</sup> April 2015. Dr. R. T. Patil having a vast expertise in the field of post-harvest processing of food, elucidated on the present food habits of Indians and the people of other geographic origin, their pros and cons, and major intervention needed to promote a healthy lifestyle. He emphasized the need for consumption of balanced diet having carbohydrates, fats, proteins, vitamins and minerals. The lecture was attended by all the Scientists and Technical Officers of the Institute. The programme ended with vote of thanks by Dr. P.G. Patil, Director, ICAR-CIRCOT.



Welcome of Dr. R. T. Patil, Former Director, ICAR-CIPHET, Ludhiana with flower



Dr. R.T. Patil delivering the lecture

### (2) lecture on “Textile Processing Industry – Quality & Ecological Perspectives – Eco labels”

Dr. G.S. Nadiger, Member, RAC delivered a lecture on Textile Processing Industry – Quality & Ecological Perspectives – Ecolabels on 18<sup>th</sup> April, 2015. He emphasized on the levels of pollution emanating from the Textile Processing Industries and explained about the



hazardous chemicals and dyes used in the dyeing industries.

Dr. G.S. Nadiger delivering a lecture on Textile Processing Industry – Quality & Ecological Perspectives - Ecolabels

### (3) Deputation Report – Visit to Benin under Cotton TAP for Africa

Dr. P. G. Patil, Director, CIRCOT and Er. A. K. Bharimalla, Sr. Scientist, TTD, Presented the report of their deputation to Benin under Cotton Technical Assistance Programme (Cotton TAP) for Africa on 24<sup>th</sup> April, 2015, at Jubilee Hall, CIRCOT. This visit was aimed at conducting In-country Training Programme on “Post-harvest Management and value addition of crop Residue” and site selection for setting up of Regional Knowledge Cluster cum Training Centre on Post-Harvest & Ginning Technology”. The presentation was attended by all staff members of CIRCOT.



Dr. P. G. Patil, Director, CIRCOT Presented experience regarding deputation to Benin, Africa under cotton TAP

## HRD Activity

### *Meeting for finalization of areas for foreign collaboration*

Dr. N. Vigneshwaran, Sr. Scientist, CBPD, presented the list of identified areas (by Scientists) in which foreign collaboration can be entertained on 7<sup>th</sup> April 2015. Inputs were collected from the experts and the areas viz. processing of machine harvested cotton, Industrial application of microbial Degossypolization and biopolymer based nanocomposites were finalized for foreign collaboration.

### *Intellectual Properties / MoU Signed*

#### *Patent Granted:*

Patent was granted to the invention "Development and use of Rubber Disc with soft rubber layers as material for self-grooving roller in roller ginning machines" on 15.04.2015.

**Patent Number - 266213**

**Patent Application number - 1186/MUM/2005**

**Date of filing – 18/10/2005**

**Patentees –**

1. ICAR-CIRCOT, Mumbai, Maharashtra
2. Millenium Rubber Technologies Private Limited, Thrissur, Kerala

**Inventors - Tachaparambil Sankara Pillai ManojKumar, Lawrence John SelvaKumar, Arude Vishnu Govind, Krishnavilas Krishnan Anand, Noby Joseph, Joji Joseph Thelly.**

#### *MoU's Signed:*

- I. MoU signed with M/s. Suryavanshi Spinning Mills, Secunderabad regarding "Production of Nanocellulose from Cotton Linters and use of electrospun nanofibers in filters" on 04.04.2015.
- II. MoU signed with M/s. Croda India Company Pvt. Ltd., Koparkhairane, Navi Mumbai regarding "Spinning performance of spin finish for P/V Blend" on 17.4.2015

## Product Development

Multipurpose Cotton bag has been designed by the institute for distribution as a registration kit during the Silver Jubilee Celebration of National Academy of Agricultural Sciences (NAAS), New Delhi to be held during June 2-5, 2015.



Multipurpose Cotton Bag

## Visit of Dignitaries



Dr. Kanchan K. Singh, ADG (Engg), ICAR, visited CIRCOT Mumbai



Dr. V. K. Kothari, Emeritus Professor, Department of Textile Technology, IIT Delhi, visited Nanocellulose pilot plant on 10<sup>th</sup> April, 2015





Mr. K. V. Deshmukh, Director of Agriculture (Extension & Training), Govt. of Maharashtra visiting different facilities at CIRCOT, Mumbai



Dr. N. K. Krishna Kumar DDG (Horticulture) visited SEM Lab

## Swachh Bharat Mission

The staff of the Institute formed a human chain and removed old files and unserviceable items, files from basement area of MS building, CIRCOT on 25<sup>th</sup> April, 2015.



Cleaning work by CIRCOT Staff members

## Director's Visit

Dr. P. G. Patil, Director visited CIRCOT Quality Evaluation Unit, Coimbatore to monitor the research activities and working of the Unit and had discussed with Dr. S Venkatakrishnan, CTO & Officer In-charge of the Unit about strengthening the Unit. In this

connection he visited the following institutions regarding selection of the sites for strengthening of QUE's, Coimbatore Unit.

- (i) Sugarcane Breeding Institute, Seeranaickenpalayam, Coimbatore
- (ii) Regional station of CIAE, Bhopal, Seeranaickenpalayam, Coimbatore
- (iii) Sardar Vallabhbhai Patel International School of Textile & Management, Peelamedu, Coimbatore.

## Student Visits

**STUDENT VISIT TO QEU's, CIRCOT Regional unit, Coimbatore.**

Demonstration of the cotton testing facilities available at the centre to Sixteen M.Sc (Agri)-agronomy students from TNAU, Coimbatore on 23<sup>rd</sup> April, 2015.



Students Visit at CIRCOT Regional unit, Coimbatore

## Personal

1. Dr. S. V. Ghadge, Sr. Scientist taken Charge as In-charge of Technology Transfer Division on 22<sup>nd</sup> April, 2015

### Transfer

1. Dr. S. V. Ghadge, Sr. Scientist transferred from ICAR-National Institute of Abiotic Stress Management, Bharamati, Pune to CIRCOT, Mumbai on 21<sup>th</sup> April, 2015
2. Shri K. Narayanan, Sr. Technical Officer transferred from Quality Evaluation Unit, Dharwad to ICAR-CIRCOT, Mumbai on 27<sup>th</sup> April, 2015.

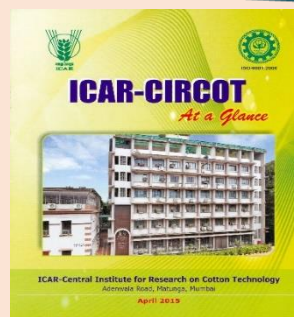


## Retirement

1. Shri M. B. Gurave, Skilled Supporting Staff, CIRCOT, Mumbai Retired on 30.04.2015

## Publications

Technical Bulletin - "CIRCOT at a Glance"



## Upcoming Events

ICAR short course on 'Fermentation Technology for value addition to cotton by-product and biomass' scheduled on 7-16<sup>th</sup>, September, 2015



**ICAR Short Course On**

**Fermentation Technology for value-addition to cotton by-products and biomass**

peptone  
cottonseed cake  
fish & poultry feed  
cottonseed  
cotton stalks  
fermentation  
bioenriched compost  
mushroom  
bio-ethanol

**September 07-16, 2015**

Organized by  
**ICAR-Central Institute for Research on Cotton Technology (CIRCOT),**  
**(Indian Council of Agricultural Research)**  
Adenwala Road, Matunga,  
Mumbai - 400 019, Maharashtra, India

Sponsored by  
**Indian Council of Agricultural Research**  
New Delhi 110 012 (INDIA)

## Introduction

Fermentation is the term derived from latin word "fervere" which means "to boil", describing the bubble like appearance produced during the anaerobic fermentation of sugars by yeast. Fermentation is an age old process which was primarily employed for preservation of fruits, vegetables, grains etc. and to improve its nutritional property. The fermentation process is also used for the production of enzymes, antibiotics and other bio-active compounds for medical and industrial applications. Now-a-days, the term fermentation is broadly used and defined as the production of food, chemical and fuel by micro-organisms for the welfare of human beings.

The annual production of agro-wastes in India is estimated to be 700 million tonnes. These wastes are other-wise called ligno-cellulosic wastes which mainly contains cellulose, hemicellulose and lignin in their chemical composition. These agro-wastes are viable substrate for fermentation process since they are renewable, produced annually and have application for bioconversion into useful products such as food, fuel and fine chemicals. In cotton, the cottonseed and cotton stalks are the two major by-products. In India, about 12 and 40 million tonnes of cottonseed and cotton stalks respectively are produced annually. The cottonseed produced in the country is mostly extracted for oil. The other products being produced during the processing are linters, hulls and meal. The value-addition to cottonseed by fermentation technology makes cottonseed processing more economical and viable. The applications of fermentation process in value-addition of cottonseed are efficient linter and oil recovery, degossypolization and nutritive quality improvement of cottonseed protein, industrial enzymes and peptone from cottonseed meal and bio-enrichment of cottonseed hulls. Except a small proportion has been used for domestic fuel, mostly the cotton stalks is burnt in the field itself.



The application of fermentation process in cotton stalks utilization finds industrial application, restores soil health, and avoids burning of cotton stalks in the field. The industrial micro-organisms such as yeast and filamentous fungi employed in fermentation process produces complex of enzymes and other metabolites that aids in conversion of biomass into useful products. The possible applications in cotton stalks utilization are production of high value compost, bio-ethanol, mushroom etc.

### Objectives

The major objectives of the short course are

- ❖ To acquaint participants with the basics of fermentation technology
- ❖ To impart training on role of fermentation technology in biomass utilization
- ❖ To demonstrate the application of fermentation technology for value-addition to cottonseed and cotton stalks

### Curriculum

A series of lectures and practical demonstrations will cover the basics of fermentation technology, role of fermentation technology in biomass utilization and its application in value-addition to cottonseed and cotton stalks. The Institute is well equipped with instruments for cultivation of micro-organisms (Laminar Air flow chamber, Incubator shaker and fermenter) and characterization ( Automatic Nitrogen Analyzer, Fibre Analyzer, UV-Vis spectrophotometer, Fluorescent Microscope and Scanning Electron Microscope).

### Eligibility

Applicant should be a post-graduate in any discipline of agriculture or related basic science and working as Scientist in ICAR institutes or as Assistant Professor and above in any of SAUs/Central Agricultural University/Deemed University/General University with agriculture faculty. The total number of participants will be restricted to 25. Selection will be primarily based on the above said eligibility conditions and first-come-first-serve basis.

### How to apply

Eligible and interested candidates can apply in the enclosed proforma or apply online. For online application, register at <http://www.iasri.res.in/cbp/> and fill up the form, submit and take a printout and send the same duly forwarded by the competent authority to the Course Director on or before August 10, 2015. A non-refundable registration fee of Rs. 50/- (Rupees fifty only) in the form of an Indian Postal Order/Demand Draft drawn in favour of "Director, CIRCOT" payable at Mumbai should be sent along with the application form.

### Boarding & Lodging

Participants will be paid travel fare of to and fro journey by rail or bus as per their entitlement, restricted to the maximum of AC II tier. TA will be paid on production of valid tickets. Free boarding will be provided during this training programme. Free lodging shall be provided on first-come-first-serve basis. Since the accommodation is very limited at this Institute, participants are requested to arrange for their stay, if possible. Cash allowance in lieu of boarding & lodging are not permitted.

### Application form for participation

ICAR short course on "Fermentation technology for value-addition to cotton by-products and biomass"  
(At Central Institute for Research on Cotton Technology, Mumbai)

September 7-16, 2015

1. Full name (in block letters) :
2. Designation :
3. Present employer and address :
4. Address to which reply should be sent :  
(including email, mobile and fax)
5. Permanent Address :
6. Date of Birth :
7. Sex (M/F) :
8. Teaching/research/professional experience (mention post held during last five years and number of publications in refereed journals) :
9. Marital status: (Married/Unmarried) :
10. Mention if you have participated in any research seminar, Summer/Winter school/Short course :
11. Whether accommodation is required: Yes/No
12. Academic record

Examination passed	Subject Main/ Subsidiary	Year of passing	Class/Ranks/ Distinctions etc.	University/ Institution	Other information
Bachelor's					
Master's					
Ph.D					
Others					

Date \_\_\_\_\_  
Place \_\_\_\_\_ Signature of the applicant

13. Recommendations of forwarding Institute

#### Certificate

It is certified that the information furnished above has been verified and found to be correct.

Signature \_\_\_\_\_  
Date \_\_\_\_\_ Director/Head of the organization

Institution seal \_\_\_\_\_

### About Mumbai

Mumbai, Capital city of Maharashtra known as Bombay until 1995, is a great port city, situated on the west coast of the Indian peninsula. The seven islands, that constituted Mumbai were home to communities of fishing colonies. Mumbai is the financial, commercial & entertainment capital of India. Important tourists places are Gateway of India, Elephanta Caves, Queen's Necklace, Jehangir Art Gallery, CST railway station, Sea link bridge, Mount Mary Church, Hanging garden, Siddhivinayak temple, Haji Ali etc.

### How to reach CIRCOT, Mumbai

Distance from Airport (Domestic) : 10-12 km  
Railway station (Dadar) : 2 km  
Land mark : Five Gardens

### Weather

September coincides with the end of monsoon. The weather will be pleasant with mean daily temperature approximately 25° C.

### Important dates to remember

Last date for receipt of nomination : Aug 10, 2015  
Intimation to selected participants : Aug 14, 2015  
Course commencement : Sept 07, 2015

### Organizers

Director, CIRCOT : Dr. P.G. Patil  
Course Director : Dr. V. Mageshwaran, Scientist  
Course co-ordinators : Dr. S. Saxena, Pr. Scientist & I/C CBPD  
: Dr. S. V. Ghadge, Sr. Scientist & I/C TTD  
: Er. A.K. Bharimalla, Sr. Scientist

### Address for correspondence

Er. A.K. Bharimalla  
Sr. Scientist & Course co-ordinator, TTD  
ICAR-Central Institute for Research on Cotton Technology  
Adenwala Road, Matunga (E), Mumbai – 400 019  
Email: bpd.circot@gmail.com  
Ph: 022-24127273, Fax: 022-24130835, Cell: 9702878249  
Updates are available at  
[www.circot.res.in](http://www.circot.res.in)







### ADDRESS FOR CORRESPONDANCE

The Director

ICAR-Central Institute for Research on Cotton Technology

DARE, Ministry of Agriculture, Govt. of India

Adenwala Road, Matunga (E), Mumbai – 400 019

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