



EXHIBITION CUM VISITORS' ROOM



SCANNING ELECTRON MICROSCOPE



BET SURFACE AREA ANALYSER

A Monthly Insight into the ICAR-CIRCOT

e - News Letter

June, 2015, Vol.2, No.3

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Published by

Director, ICAR-CIRCOT

Editorial Board

Dr. P. G. Patil

Dr. S. V. Ghadge

Er. A. K. Bharimalla

Dr. C. Sundaramoorthy

Er. G. Krishna Prasad

Dr. T. Senthilkumar



Director's Desk...

Globally, 140 billion metric tons of agro waste is generated every year from agriculture. Huge amounts of air pollution are produced worldwide by the burning of 3 billion metric tons of biomass such as wood, leaves, trees, grass and trash annual. Biomass burning represents the largest source of air pollution in many rural areas of the developed and developing countries. Globally, around 18 percent of the world's human-caused CO₂ emissions was generated from biomass burning, representing nearly 8.5 billion tons of CO₂ annually. The ill-health effects of biomass burning are well-established. Smoke from biomass burning is particularly dangerous since most of the particulates are smaller than 10 microns in size (PM₁₀) and are easily able to travel deep into the lungs. In addition to public health issues, biomass burning has a big impact on global warming. Biomass has the potential to become one of the major global primary energy sources during the next century, and modernized bioenergy systems are suggested to be important contributors to future sustainable energy systems and to sustainable development in industrialized countries as well as in developing countries.

Cotton stalks and other agro-wastes are abundantly available in India. The annual estimated production of cotton stalks is around 30 million tonnes. Several value added products can be produced from cotton stalks like particle boards, briquettes, pellets, composts, and can be converted into ethanol and utilised for power generation. However majority of cotton stalks are still burnt in the field that leads to soil, water and air pollution as well as deterioration of soil fertility. There is tremendous scope and demand for production and export of pellets and briquettes prepared from agro-waste, particularly from cotton stalks, which may increase the farm income and promote rural industrialization leading to employment generation. In view of the importance of saving of energy and conservation of resources, efficient recycling of cotton stalk is now a global concern requiring extensive R&D work towards exploring newer applications and maximizing use of existing technologies for a sustainable and environmentally sound management.

P.G. Patil



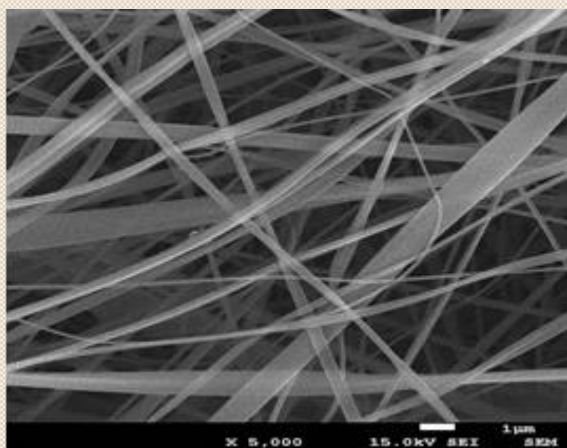
ICAR-CIRCOT, Mumbai



Technology Insight

Process for Production of Electrospun Fibre Mat from Cellulose Acetate

The electrospinning solution were prepared in binary mixture of cellulose acetate powder and acetone. In-house electrospinning setup was used to produce electrospun fibre mat. A flat ended stainless-steel needle was used at the nozzle and a Gamma High Voltage DC power supply was used to generate high DC potential across the needle and aluminum collector. The positive polarity was connected to the needle and the ground connected in to aluminum collector. DC voltage was applied to the syringe needle by high voltage power supply. The distance between needle and aluminium collector was kept at 15 cm and the flow rate of the cellulose acetate polymer solution was 0.03 ml/min. The electrospun cellulose acetate fibre was collected on stationary target i.e. aluminium plate.



**SEM image of cellulose acetate (CA)
Electrospun fibre mat**

The surface morphology of the cellulose acetate electrospun mat was analysed using a Scanning Electron Microscope (SEM) and the fibre diameter was achieved in the range of 100- 220 nm.

Training

Training program on 'Entrepreneurship Development in the field of Biomass Management and Cotton Processing'

Ginning Training Centre (GTC), ICAR-CIRCOT, Nagpur organised a training programme on 'Entrepreneurship Development in the field of Biomass Management and Cotton Processing during 1st June - 6th June, 2015. The training programme was aimed at developing entrepreneurship skills among educated unemployed youths belonging to rural areas. Fifteen participants from different part of Maharashtra state attended this training programme. The training programme was sponsored by Agro-Plus Foundation, Nagpur.



**Dr. P. G. Patil, Director, distributing
certificates at the valedictory function**

Shri. G. H. Wairale, President, Agro-Plus Foundation, Nagpur and Dr. J.F. Agrawal, Principal, Shri Sai College of Engineering and Technology, Bhadravati were the Chief Guest and Special Guest of valedictory function. During the programme following points were deliberated (i) introduction of cotton and utilization of cotton stalks and other agro-residues for value added products (ii) The cotton quality parameters, ginning technology, (iii) collection, harvesting, conversion of cotton stalks and other agro-residues into briquettes, pellets, cattle feed, power generation (iv) marketing of value added products. In addition, field visits to nearby industries were also arranged.

Organisation of a National Seminar on “Value Addition of Cotton Stalks and Other Agro-Wastes for Rural Livelihood”

Shri Nitin Gadkari, Union Minister for Road Transport, Highways & Shipping inaugurated the National Seminar on “Value Addition of Cotton Stalks and Other Agro-Wastes for Rural Livelihood” on 6th June, 2015 at Nagpur.

Shri Gadkari, while delivering inaugural address as Chief Guest, advised farmers to grow crops after studying economic viability, instead of blindly sticking to traditional crops. Hon’ble Minister stressed upon utilizing technology, innovative thinking and fostering the spirit of entrepreneurship among the rural youth. Minister urged to use cotton stalk and other agro wastes for making pellets and briquettes as an alternative to coal, firewood, cooking gas and for conversion into ethanol as an alternative to fossil fuel. Minister felicitated several farmers and entrepreneurs who make good use of agro waste.

Dr. C. D. Mayee, President, Indian Society for Cotton Improvement (ISCI) & Former Chairman, ASRB; while delivering the speech as Guest of Honour, expressed the need to amend the curriculum of agricultural

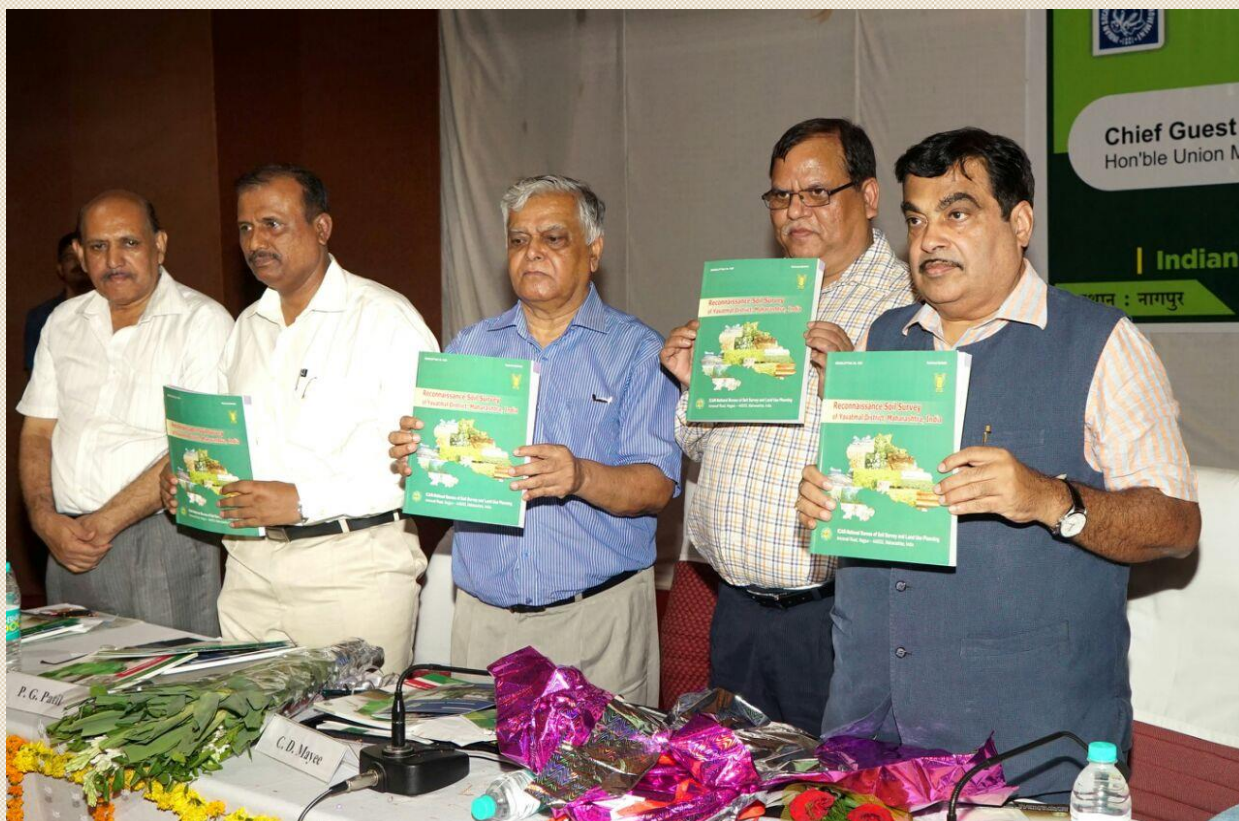
universities from primary agriculture to secondary agriculture. He also urged that advancement in agricultural technology is needed to convert waste into wealth which provides additional remuneration to farmers.

Dr. P. G. Patil, Director, ICAR-CIRCOT delivered the welcome address and highlighted the pioneering work done by the CIRCOT viz. establishment of one Tonne/day capacity particle board demonstration plant, composting from cotton Stalk and nanocellulose pilot plant. He also urged upon the need to promote entrepreneurship in the field of agro waste management. Dr. A.J. Shaikh, Secretary, ISCI, Mumbai; Mr. G.H. Wairale, President, Agro-plus Foundation, Nagpur; and Dr. S. K. Shukla, Officer In-charge, GTC, Nagpur shared their views on the subject.

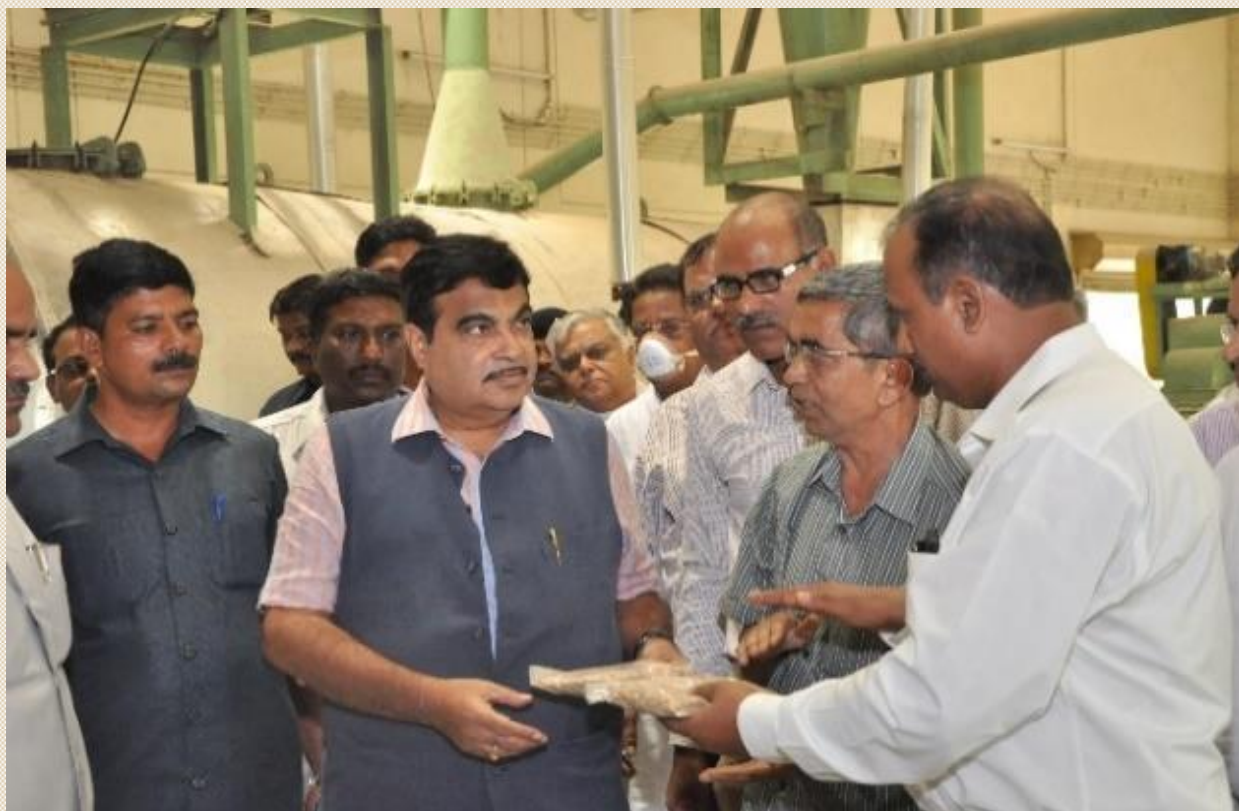
Books and Leaflets published by ICAR-CIRCOT, Mumbai and ICAR-NBSS&LUP, Nagpur were released on the occasion. The National Seminar was organised by GTC, Nagpur in collaboration with Indian Society for Cotton Improvement (ISCI) and Agro-Plus Foundation. More than 350 delegates including farmers, raw material suppliers, machine manufactures, marketing agencies and bank participated in the seminar.



Shri. Nitin Gadkari, Hon'ble Union Minister for Road Transport, Highways & Shipping delivering the inaugural address



Shri Nitin Gadkari, Hon'ble Union Minister; Dr.N.K. Singh, Director, NBSS&LUP; Dr.C.D. Mayee, President, ISCI; Dr.P.G. Patil, Director, CIRCOT; Dr.A.J. Shaikh, Secretary ISCI (from right to left)



Shri Nitin Gadkari, Union Minister being briefed about Particle Board at Demonstration Plant, GTC Nagpur by Dr.P.G.Patil, Director & Dr.S.K.Shukla



Delegates and farmers at the seminar



Shri Nitin Gadkari, Union Minister felicitating a farmer supplying biomass for value addition



Shri Nitin Gadkari, Union Minister at the Exhibition

Exhibition

An exhibition was organised by Ginning Training Centre (GTC), ICAR-CIRCOT, Nagpur on the occasion of the National Seminar.

The exhibition was inaugurated by Shri Nitin Gadkari, Hon'ble Union Minister in the presence of Dr.C.D. Mayee, Former Chairman, ASRB, New Delhi and President, ISCI, Mumbai. Cotton stalk and other agro-residues harvesting and chipping machines, cattle feed making machinery, pellet and briquette making technologies, value added products from biomasses were displayed prominently by different stake holders viz. Shaktiman Tractors, Maharashtra Engineering works, Mlakapur, Abellon Clean Enegy Pvt ltd, Ahmedabad, Purti Alternative Fuels Pvt Ltd, Mumbai, Karunanand Hydropneumatics, Dombivali.

Meetings

Briefing about Directors' Conference and Reviewing of Flagship Projects

A meeting was chaired by Dr. P.G. Patil, Director on 2nd June, 2015 to brief the deliberations held in the Conference of Vice-Chancellors of Agricultural Universities and Directors of ICAR Institutes during 14-15th May, 2015 at A.P. Shinde Symposium Hall, NASC, Pusa, New Delhi. Meeting was attended by scientist, technical officers and administrative staff.

During the meeting, Dr. R. Guruprasad, Scientist and Nodal Officer of Research Data Management gave a talk on ICAR Guidelines for Internal Evaluation and forwarding research papers to Scientific Journals and Data Management in ICAR Institutes. The salient achievements made in the Flagship project "Development of innovative fibre blends and finishes for improved functionality of cotton textiles" was presented. Director CIRCOT emphasised to make the innovative, speciality textile products without any further delay.

BIS Surveillance Audit

The Bureau of Indian Standards (BIS) conducted the mandatory surveillance audit for ISO 9001:2008 accreditation of the institute on 11-12th June, 2015. Shri M.D. Chilakwad, Team Leader and Shri G.P. Kanchi, Expert conducted audit in the Quality Evaluation and Improvement (QEID), Mechanical Processing (MPD), Transfer of Technology (TTD), Engineering section, Security and House-keeping. There was opening meeting in the forenoon and closing meeting in the afternoon of 12th June, 2015. During the closing meeting, the auditors expressed satisfaction over functioning of quality management system of CIRCOT as per ISO 9001:2008.



Meeting with BIS Expert Committee members



Expert committee members discussion with scientists during the audit

Visit of Shri Ravinesh Kumar, CVO, ICAR, New Delhi

A team comprising of Shri. Ravinesh Kumar, Chief Vigilance Officer, and Shri. Hareesh Nair, Under Secretary (Vigilance), ICAR visited the Institute for vigilance inspection on 12.06.2015.



Director presenting various activities and achievements of the Institute to the Chief Vigilance Officer, ICAR



Shri. Ravinesh Kumar, CVO, ICAR at Nano-Cellulose Pilot Plant



Shri. Ravinesh Kumar, CVO and Shri. Hareesh Nair, keenly observing the Institute products displayed at Exhibition cum Visitors Room

Dr.P.G. Patil gave the brief presentation about the various activities and achievements of the institute. Shri. Ravinesh Kumar in his address appreciated the efforts taken by the institute in the field of commercialization of developed technologies. Further he also described the role of vigilance particularly preventive vigilance to avoid inadvertent mistakes and procedural lapses by scientific officers. He emphasized the importance of educating the people in the area where they tend to commit mistake like purchase & procurement, tenders, recruitment etc. by organizing workshops and interactive meets.

He has also given tips on importance of filing of annual property returns, role of vigilance officer of the institute, rotation of staff within the institute. Dr. A. S. M. Raja, Institute Vigilance officer, CIRCOT proposed the vote of thanks.

Events

Hindi Workshop



Dr. N. Shanmugam, In-Charge QEID welcoming Shri Suresh Jain, Ex. Assistant Director (Official Language), NITI, Mumbai.

To implement official language policy, one day Hindi work shop was organized for Scientists on the subject "कार्यालयीन हिंदी लिखने में आनेवाली समस्याएँ और समाधान" on 20th June, 2015 for scientists to do their official work in Hindi. Shri Suresh Jain, Ex. Hindi Officer of NITI, Mumbai and Dr. M.L. Gupta, Assistant Director, Hindi Teaching Scheme took part in Hindi workshop. Eleven scientists were benefited by this workshop. Smt. Kiran Joshi Hindi officer also gave important tips to improve the Hindi language.



Shri Sunil Kumar, Administrative Officer welcoming Shri M. L. Gupta, Asst. Director, Hindi Teaching Scheme, Mumbai

Swachh Bharat Mission



Cleaning Work by CIRCOT Staff Members

The staff of the Institute formed a human chain and removed old scrap, unservicable items, damaged papers from Technical Information Section on 6th June, 2015. Sixty-one staff members participated in this programme.

MoU Signed

An MoU was signed with M/s. IPSA Texchem Pvt. Ltd., Mumbai on 8th June, 2015, for Development of Formulation with Antifungal Agents for Applying as Lubricants on Synthetic Yarns

Seminars/Conferences Attended

Dr. P.G. Patil, Dr. S.V. Ghadge, Er. V.G Arude, Dr. S.K. Shukla, and Ms. Varsha Satankar, participated in the National Seminar on "Value Addition of Cotton Stalks and Other Agro-Wastes for Rural Livelihood" held at Nagpur on 6th June 2015.

Shri G.T.V. Prabu, Scientist, Mechanical Processing Division attended a two day International Workshop on Electrospinning and Electrospaying organized by South Indian Textile Research Association (SITRA), Coimbatore, Tamil Nadu on 22-23rd June, 2015.

Installation of Rubber Dams

Two ICAR Flexi Check Dams developed under the NAIP project have been installed at Kanse village, Ambegaon Taluka, Pune District. Installation of the Rubber Dam has been accomplished after conducting series of activities such as survey and selection of suitable site, sensitization of villagers, construction of base concrete structure and installation of the textile reinforced rubberised composite sheets. The need based execution of inflation and deflation mechanism of the "ICAR Flexi Check Dam" has been demonstrated to the villagers.

Under the able guidance of Dr. P. G. Patil, Director, ICAR- CIRCOT, the activities have been successfully executed by Dr. S. K. Jena, Principal Scientist, Indian Institute of Water Management, Bhubaneshwar, Er. A. K. Bharimalla, Senior Scientist, ICAR-CIRCOT, Mr. Panda, Mr. Bander and Sharad Kokane, Sr. Technical Officers.



Demonstration of Inflation and Deflation



Inflated Rubber Dam

Director's Visits

Visit to M/s. Purti Power and Sugar Ltd, Nagpur

Shortage of electricity is a major concern in rural India. Demand of electricity could be met by exploiting the non-conventional energy sources such as agricultural biomass. Cotton stalk biomass which is available to the tune of about 30 million tonnes annually in India, which could be used as a fuel for generation of electricity as well as for production of densified fuel pellets that can be used for cooking of meals in restaurants and rural household purposes at cheaper rate than commercial LPG.

In this context Dr. P. G. Patil, Director, ICAR-CIRCOT visited M/s. Purti Power and Sugar Ltd, at Bela in Nagpur District on 7th June, 2015. Purti has Bagasse based co-generation power plant of about 25 MW which uses sugarcane waste as its fuel. Besides this other agricultural biomass including cotton stalk is also being used for power generation. Purti has started this by-product based industry as a step towards Non-conventional energy and production of electricity on a commercial basis. The power generated is sold to MSEB. Director also visited the pelleting plant housed in the premises of Purti at Bela. Dr. S. V. Ghadge, Senior Scientist and Head (In-charge), TTD and V. G. Arude, Scientist also accompanied the Director during the visit.

Visit to VNIT, Nagpur



Dr. P.G. Patil at VNIT, Nagpur

Director CIRCOT Visited VNIT and discussed the Future Collaboration between the two institute on the Nanocellulose based technologies with Shri. Jamdar, Dr. P.M. Padole, Dean (FW).

Visit to GTC, Nagpur

Dr. P.G. Patil, Director, CIRCOT visited GTC Nagpur to take stock of research trials for making particle boards from Cattail (*Typha latifolia*) the agro waste supplied by IARI New Delhi.



*Dr. P.G. Patil, and Dr. S.K. Shukla observing the possibilities of conversion of Cattail (*Typha latifolia*) into value added products.*

Personal

Mr. G. Krishna Prasad, Scientist, MPD was nominated as Quality Manager of NABL Quality Systems of Laboratories under ISO 17025:2005, w.e.f 3rd June 2015

ICAR, New Delhi has nominated Dr. A. S. M. Raja, Senior Scientist, CBPD, as Institute Vigilance Officer, w.e.f. 12th June 2015

Accolades

Smt. Tereza T. D'Souza, Personal Assistant, Mechanical Processing Division, have participated in 10 kilometre Qualifier Run of Joint N Motion, held on 7th June, 2015 at Thane, Mumbai

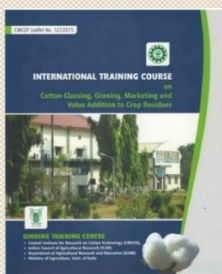
Publications

Book/Leaflets released by Shri. Nitin Gadkari, Hon'ble Minister on 6th June 2015.

(i) **Book:** *Cotton Sector in Africa (Vol. I)*
 Authors: P.G Patil, P.S. Deshmukh, C. Sundaramoorthy, T. Redij, A.K. Bharimalla, V.G. Arude, S.K Shukla, N.Shanmugam.



(ii) Leaflet No: 127/2015 International Training Course on Cotton Classing, Ginning, Marketing and Value Addition to Crop Residues



(iii) Dr. C.D. Mayee, former ASRB Chairman released Hindi Publication of "AMBER' ('अंबर')" edited by Dr. P.K.Mandhyan, Mrs. Sudha Tiwari, Mrs. K.R. Joshi, Shri S. Banarjee, Shri R.R. Chhagani, on 25th June, 2015 at CIRCOT.



Upcoming Events

Training Course on "Quality Evaluation of Cotton" at ICAR-CIRCOT, Mumbai

Training Calendar for 2015 -16

No.	From	To
1.	06-07-2015	10-07-2015
2.	20-07-2015	24-07-2015
3.	10-08-2015	14-08-2015
4.	24-08-2015	28-08-2015
5.	07-09-2015	11-09-2015
6.	14-12-2015	18-12-2015
7.	11-01-2016	15-01-2016
8.	08-02-2016	12-02-2016

COURSE CONTENTS

- Advances in Ginning Technologies
- Introduction and Practical in Cotton Grading
- Cotton Crop By-products
- Fiber Length Measurement using Conventional Instruments
- Demonstration in Fibre Fineness and Maturity
- Cotton fibre Testing using High Volume Instrument (HVI) and Advanced Fibre Information System (AFIS)
- Mechanical Processing of Cotton
- Contamination in Cotton and Marketing & Commercial aspect of Cotton
- Techno Entrepreneurial Activities and Business Planning Development
- Visit to Cotton Association of India, Cotton Green

Course Fee: Rs. 5618/- (Inclusive of taxes)

Contact Details

Mr. Dilip Kamble 09004892934
 Mr. Anand Jadhav 09821760036
 Phone: 022-24127273/76, Extn – 118
 Fax: 24157239/24130835
circottraining@gmail.com



ICAR Short Course On



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



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.

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.lasri.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.

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).

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 _____
Director/Head of the organization

Date _____
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



हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद



Bharat Ratna Shri. Atal Bihari Vajpayee, the former Prime Minister of India, visited the Institute which at that time was known as Central Technological Research Laboratory, Mumbai on 29th September, 1988 for review of activities related to implementation of Rajbhasha



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
www.circot.res.in

