



ISO-9001:2008

# ICAR-Central Institute for Research on Cotton Technology



## ICAR-CIRCOT e-Newsletter

### Director's Column

Dear Esteemed Readers,

At the outset, I feel extremely happy to bring out the CIRCOT's first e-Newsletter. I am pleased to inform you that, I have taken up the responsibility of the Director (Acting), of CIRCOT, Mumbai and assure you that I would put my best efforts to improve the overall performance of the Institute in R&D activities, to make CIRCOT a pioneering institute for research on Post-harvest technology of cotton for the development of technologies for farmers and textile industries.

During reporting period apart from research, training is one of the major activities and the institute has organized three training programmes in the area of ginning technology and cotton quality evaluation apart from a tailor made training programme on "Nanotechnology and its application".

The technologies developed by the institute are popularized through participation in the exhibitions, organization of field demonstration and awareness meets. Two such field demonstrations were organized along with a roadshow to popularize the rubber roller DR gin technology.

Now the institute has a separate innovation cell, which facilitates activities to maintain the spirit of innovation among scientists, technical officers and administrative staff in the research and administrative activities.

Further, I take this opportunity to congratulate all the staff members of the Institute on receiving the quality management system certification ISO 9001:2008 accredited by BIS. I also congratulate the award winning scientist.

I also express my sincere appreciation to the editorial board for this new intervention of bringing out CIRCOT e-newsletter.

With best regards,

Dr.P.G.Patil  
Director (Acting)

## Dr. P. G. Patil has taken over the charge of Director, (Acting), CIRCOT



Dr. P. G. Patil took over the charge of Director, CIRCOT on 7<sup>th</sup> May, 2014. In his meeting with scientists he committed to make best efforts to bring CIRCOT as a prominent institution in the field of post-harvest technology of cotton. He also emphasized that timely completion of the tasks is essential to achieve desired goal.

Dr. Patil did his B. Tech. (Agril. Engg.) from M. P. K. V., Rahuri, M. Tech. (Post-harvest Engg.) from IIT, Kharagpur and Ph.D. from VNIT, Nagpur. Dr. Patil joined Agricultural Research Service of ICAR as Scientist (Agril. Structure and Process Engg.) at Ginning Training Centre, Nagpur of CIRCOT, Mumbai in 1993. He then became Officer-in-charge, GTC, Nagpur in 1995 and impressively served more than 20 years in research, training and transfer of technology in the field of cotton ginning and cotton by-product utilization.

Dr. Patil was instrumental in making Ginning Training Centre, Nagpur as a state-of-art Centre for conducting research in ginning technology. He organized several training programmes for ginners, technicians, managers, etc. He played a pivotal role in establishing a Particle Board Demonstration Plant funded by CFC, Netherlands and also commissioned the Scientific Cottonseed Processing Plant at Nagpur. He also served as Ginning Consultant, in Technology Mission on Cotton (TMC), and has made significant contribution in modernization of ginning industry in India.

He has also worked as Professor and Head, Dept. of Farm Structure from 2008 to 2011 at College of Agril. Engg. and Technology, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (MS). He taught courses to UG, PG and Ph.D. students for agricultural engineering discipline and supervised the research and development activities of University.

Dr. Patil also worked as Head, Transfer of Technology Division at CIRCOT, Mumbai and has been associated with development of several machineries (laboratory model gins, pre and post cleaners, delinting machines) and processes in the area of post-harvest technology of cotton. He successfully organised the training cum exposure program for the delegates from C-4 African countries (Benin, Burkina Faso, Chad, Mali), Nigeria, Uganda & Malawi.

Dr. Patil has published several research papers in referred journal, popular articles, books, book chapters, conference papers, bulletins, manual, reports and has one patent to his credit. He has contributed immensely in the HRD of the Ginning sector by training more than 3000 personnels from cotton industry and some of them are successful entrepreneurs.

# Contents

## 1. Technology Highlights

- ❖ Doffing system and enclosure for Double Roller gin to reduce the dust emission
- ❖ Water-Free Hydrophobic Finishing of Cellulosic Textile using Plasma technology
- ❖ An Accelerated Process for the Preparation of Bio-enriched Compost from Cotton Plant Residues

## 2. Training

- ❖ Quality Evaluation of Cotton
- ❖ Basics of Nanotechnology and it's applications for RCF Scientists
- ❖ Double Roller Ginning Technology & Cotton Quality Evaluation

## 3. Exhibition/ Field Demonstration/ Awareness meet

- ❖ Krishi Mahotsav, 2014
- ❖ Field Demonstration cum Awareness Workshop for Farmers
- ❖ Field Demonstration cum Awareness Workshop for Farmers
  - ❖ Roadshow on Self-grooving Rubber Roller DR gin Technology

## 4. Events

- ❖ Celebration of ICAR Foundation day
- ❖ Visit of Delegates from Ethiopia Institute of Agricultural Research
- ❖ Visit of Joint Secretary, Ministry of Textiles
- ❖ ZITMC meeting of west zone
- ❖ Lecture from Innovation Cell

## 5. Awards & Recognition

- ❖ ISO 9001:2008 accreditation by BIS
- ❖ NASI-SCOPUS Young Scientist Award 2014

## 6. Conferences & Seminars attended

## 7. Human Resource Development

## 8. Personnel

## 9. Up coming Events





# 1. Technology Highlights

## Doffing system and enclosure for Double Roller gin to reduce the dust emission

Dust pollution is a major concern in Indian cotton ginneries. The airborne respirable dust levels in ginneries are much higher than the permissible limits. Ginning, immature boll picking and raw cotton feeding locations of the Double Roller (DR) Gins are the major sources where from 90% fine particulate matters emanate into the gin hall.

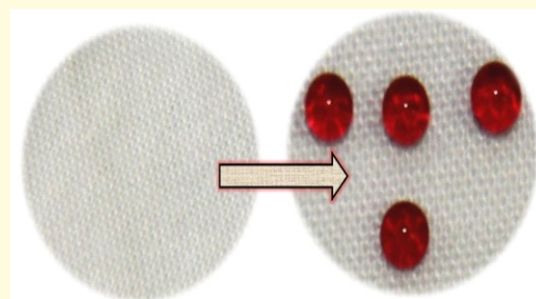
An automatic lint doffing system and an enclosure of the DR gins were designed, developed and evaluated to arrest the fine particles that emanate from the ginning point of the DR gins. The automatic lint doffing system consists of a take up unit, driving and doffing mechanisms. Rexin cotton has been found as the most suitable material among six different materials tested for doffing of lint. The optimum speed for doffing roller has been found as 100 rpm. The designed and developed enclosure system arrests around 80% of total dust generated from the ginning point of the DR gins.



DR gin with doffing system & enclosures

## Water-Free Hydrophobic Finishing of Cellulosic Textile using Plasma Technology

Chemical processing of textiles is water intensive and it causes pollution. It is approximately estimated that 150 litres of water is used to process one kg of textile and finally discharged as effluents. In CIRCOT, Plasma Technology has been used in the lab-scale to impart hydrophobicity to cotton fabric without using any water medium, as is normally done in the conventional processing. CIRCOT has developed an indigenous prototype atmospheric pressure plasma reactor, in which the plasma is produced in the presence of helium (He)/fluorocarbon gases through a discharge voltage of ~5 kV. When cotton fabric was subjected to the this plasma for one minute, the hydrophilic cotton surface was turned into highly hydrophobic one. As a result, the fabric did not absorb a water droplet of 37  $\mu$ l even after 150 seconds, whereas in the untreated sample the water droplet got absorbed within 4 seconds. The water absorbency time could be further increased to 540 and 3600 seconds by increasing the plasma treatment time for 3 minutes and 12 minutes, respectively. It was also found that plasma treatment is not affecting other comfort properties of the fabric.



Hydrophobic Modification of Cotton textile using Plasma

## An Accelerated Process for the Preparation of Bio-enriched Compost from Cotton Plant Residues

Cotton stalk is one of the abundantly available agro biomass and approximately 30 million tonnes are available in India annually. Burning it in the field after harvest leads to pollution. One of the viable alternative solution for it's utilization is composting. Cotton stalks is one of the high lignin containing (20-25%) agro residues. Conventionally, the composting of high lignin containing residues will take minimum four to six months for production of good compost. At CIRCOT an accelerated a process has been developed for preparation of good quality compost from cotton stalks which takes about two months.



Composting of cotton stalk

The acceleration of composting process is controlled by factors, such as type of microorganisms, aeration and moisture.

In the CIRCOT process, the acceleration of the process is done by using faster decomposing microbial strains. For this purpose, microbial consortia of both aerobic and CIRCOT anaerobic consortium were used. The results on composting trials indicated that using the microbial consortia, good quality compost from wet cotton stalks could be obtained in 45 days, while from dry cotton stalks it takes about 60 days. In case of control (without microbial consortia), the compost could be prepared in 90 days from dry cotton stalks and 60 days from wet cotton stalks. Thus we could save 15 and 30 days respectively for the preparation of compost from cotton stalks using the accelerated process. The analysis showed that the percent NPK content in microbial compost of cotton stalk are better than the compost obtained from FYM.

## 2. Training

### Training on Quality Evaluation of Cotton

CIRCOT has organized training programme on “Quality Evaluation of Cotton” from 21<sup>st</sup> to 25<sup>th</sup> July, 2014. Trainees from Gujarat, Maharashtra and Madhya Pradesh states attended the programme. Dr. S. K. Chattopadhyay, Head MPD, inaugurated the training and highlighted the achievements of CIRCOT. The topics covered in the training programme include advances in ginning technologies, grading of cotton, cotton fibre testing using HVI & AFIS, mechanical processing of cotton, yarn quality and yarn testing.



Industry delegates from Gujarat, Maharashtra & M. P.

### Training on 'Basics of Nanotechnology & it's Application' for RCF Scientists

A tailor- made and custom designed training programme on 'Basics of Nanotechnology & its Application' was organized by Zonal Technology Management and Business Planning & Development Unit of CIRCOT under the aegis of National Agricultural Innovation Project of ICAR during June 9-13, 2014. Dr. N. Vigneshwaran, Sr. Scientist and Er. A. K. Bharimalla, Senior Scientist were the Course Director & Course Coordinator respectively. The training was organized for the staff of M/s. Rashtriya Chemicals and Fertilizers Ltd.(RCF), Mumbai.

This training focused mainly on synthesis of nanomaterials by physical, chemical and biological means, their characterization and their applications in fertilizers, pesticides, textiles, composites and sensors. Hands-on training was imparted in handling of sophisticated equipment related to production and characterization of nanomaterials. In addition, this training emphasized on the safety measures to be taken during production & handling of the nanomaterials and the relevant international standards.



RCF official at training programme



## Training on Double Roller Ginning Technology & Cotton Quality Evaluation

Two training programmes during the month of June and July, 2014 were conducted on “Double Roller Ginning Technology & Cotton Quality Evaluation” at Ginning Training Centre (GTC) of CIRCOT, Nagpur. Trainees from Maharashtra, Andhra Pradesh and Madhya Pradesh participated in the training programmes. A series of in-house and guest lectures were arranged on different aspects of ginning, quality assessment, cotton grading and marketing and by-product utilization. In addition, hands on training were also imparted on gin settings, automation, stapling of cotton, etc. Shri G. H. Wairale, former General Manager, Maharashtra State Co-operative Growers Marketing Cotton Federation Ltd, Nagpur graced the valedictory function and distributed the certificates to the participants.



Group of delegates from Ginning Industries

## 3. Exhibition/ Field Demonstration/ Awareness meet

### Krishi Mahotsav, 2014

CIRCOT participated in the Krishi Mahotsav organized by Navsari Agricultural University, Navsari during 6-7<sup>th</sup> June 2014 at Vyara, Tapi district, South Gujarat. Hon'ble Chief Minister of Gujarat Smt. Anandiben Patel inaugurated the Krishi-Mela on 6<sup>th</sup> June 2014. Mr. C. M. More and Mr. D. U. Kamble, Technical Officers of CIRCOT participated in the exhibition and explained the various CIRCOT technologies to the farmers, students and dignitaries.



CIRCOT stall at Exhibition

### Field Demonstration cum Awareness Workshop for Farmers

A large scale 'Field Demonstration cum Awareness Workshop' was organized by GTC, on June 13<sup>th</sup>, 2014 at village Sakarla in Parseoni, Dist. Nagpur (MS) for '*Utilization of cotton stalks for various value added products and establishment of its supply chain*' with the association of NGOs, (Self-Help Group of Cotton Growers, Nagpur; Agro Plus Foundation, Nagpur; International Society for Cotton Research & Development (ISCRD), Nagpur). The workshop aimed to create awareness among farming community about the value addition to the cotton stalks through either composting or through preparation of briquettes or pellets. Live demonstration for preparation of compost using cotton stalks was also shown to the participants by the experts from CIRCOT.



Demonstration of cotton stalk composting

## Field Demonstration cum Awareness Workshop for Farmers on Supply Chain Management of Cotton Stalks for Industrial Applications

GTC, Nagpur organized a large scale 'Field Demonstration cum Awareness Workshop' at village Dhotra, Dist. Amravati on June 28<sup>th</sup>, 2014 for establishment of supply chain management of cotton stalks for industrial applications with the association of Agro Plus Foundation, Self-Help Group of Cotton Growers, Nagpur, International Society for Cotton Research & Development (ISCRD), Nagpur.

The programme was attended by farmers from Dhotra, Salora, Sirajgaon, Walani and Tiwsa villages of Amravati District (M.S). Shri. Rajkumar D. Ingle, Sarpanch and Shri Ganesh S. Jadhav, Deputy Sarpanch of Village Salora, Amravati, shared their experiences for supply of cotton stalks to briquetting plants. Mr. D. Kale, Entrepreneur, Shrikrishna Briquetting Industry, Tiwsa informed that they fetched higher price in market for the cotton stalk briquettes compared to briquettes prepared from other crop residues owing to its high calorific value. Live demonstration was also shown by the experts from CIRCOT to the farmers for chipping of cotton stalks using a tractor attached with chipper.



Awareness on supply chain of cotton stalk

## Roadshow on Self-grooving Rubber Roller DR gin Technology

A 'Self-grooving Rubber Roller DR gin Technology Roadshow' was organized at GTC, Nagpur on July 25<sup>th</sup>, 2014. The programme was held in association with Technology Information Forecasting & Assessment Council (TIFAC), Department of Science and Technology, New Delhi and Millennium Rubber Technologies Pvt. Ltd. (MRTPL), Kerala for popularization, demonstration and dissemination of the Innovation in the field of ginning technology. The programme received overwhelming response from ginners, spinners, cotton traders and gin machinery manufacturers. Dr. S. K. Singh, Director, NBSS & LUP, Nagpur lauded the development and wished for its overall success. Er. S.K. Shukla, Sr. Scientist & officer-in-charge explained about the advantages of the innovation and highlighted the limitations of using leather rollers. Mr. Noby Joseph, Director, MRTPL, Kerala informed that a ginner can fetch more profit if he uses DR Gin technology.



Inaugural function of Roadshow

## 4. Events

### Celebration of ICAR Foundation Day at Mumbai

The 86<sup>th</sup> Foundation Day of Indian Council of Agricultural Research (ICAR) was celebrated on 16<sup>th</sup> July, 2014 at CIRCOT, Mumbai. Dr. R. H. Balasubramanya, Former Head, CBPD and Former Emeritus Scientist, CIRCOT, was the Chief Guest on the occasion. Students from Synthetic & Art Silk Mills Research Association (SASMIRA), Scientific, Technical and Administrative staff of CIRCOT attended the function. An awareness about ICAR's & CIRCOT's activities was created to the visitors. An exhibition depicting CIRCOT's technologies and products was also organized for benefit of all the delegates and students.



Welcome address by Dr. S. K. Chattopadhyay



## Visit of Delegates from Ethiopia Institute of Agricultural Research

A group of delegates from Ethiopia Institute of Agricultural Research (EIAR), accompanied by the officials from Nirmal Seeds, Maharashtra visited CIRCOT on 12<sup>th</sup> July 2014. CIRCOT's research and development activities were explained to the visitors. They showed great interest in garment technology and gossypol free cottonseed cake preparation besides application of nano technology in the field of agriculture.



Delegates from EIAR with CIRCOT staff

## Joint Secretary, Ministry of Textiles visited CIRCOT

Mr. Sujit Gulati (IAS), Joint Secretary, Ministry of Textiles visited CIRCOT on 19th June, 2014. The institute activities were briefed to him and he also visited Laboratories of the institute. Dr. N. Vigneshwaran explained the preparation and uses of nanocellulose and Dr. S. Saxena demonstrated the application of plasma technology for improving the functional properties of cotton materials.



Joint Secretary visiting the labs

## Meeting of Zonal Institute Technology Management Committee (ZITMC), West Zone organized

Meeting of the Zonal Institute Technology Management Committee (ZITMC), West Zone was held on 2<sup>nd</sup> June, 2014 in the Committee Room, of CIRCOT, Mumbai. The meeting was chaired by Dr. P. G. Patil, Director, CIRCOT and Chairman ZITMC, West Zone. Deliberation were made on the benefit sharing in respect of commercialization of Bt-Detection Kits technology developed by CICR, Nagpur.



Discussion about benefit sharing of Bt-Detection Kit

## CIRCOT Innovation Cell Lecture

A lecture by Dr. (Prof) M. D. Teli, Professor of Textile Chemistry, Institute of Chemical Technology (ICT), Mumbai was arranged on 7<sup>th</sup> July, 2014 at Institutes Jubilee hall on the topic "Sustainable Culture of Innovation". In his speech, he stressed upon the need of social factor in every innovation for benefit to human being. He also explained the recent innovations taking place in the field of chemical processing of textiles. This activity was coordinated by Dr. V. Mageshwaran, Scientist and Member Secretary of the CIRCOT innovation cell.



Dr. (Prof) Teli is delivering the lecture



## 5. Awards & Recognition

### ISO 9001:2008 accreditation by BIS

Bureau of Indian Standards (BIS) conducted certification audit on 22<sup>nd</sup> and 23<sup>rd</sup> May 2014 for ISO certification of the institute. Dr. A. S. M. Raja, Senior Scientist & Management Representative and Mr. S. Sekar, CTO and Member secretary of ISO unit coordinated the entire process of ISO certification. Based on the satisfactory audit report, BIS has decided to grant Quality Management System Certification License as per IS/ISO 9001:2008 with the following Scope. 1. Research and Development of post-harvest technologies and machinery for better utilization of cotton, other textile fibres and their by-products 2. Quality evaluation and improvement of Indian cottons and their value added products, 3. Technology transfer, training, consultancy and IPR management”.



Audit report is being handed over to the Director

### NASI-SCOPUS Young Scientist Award 2014

Scopus™ instituted the Scopus young scientist awards in 2006 to recognize and reward the Indian researcher's talent, knowledge and expertise. Elsevier partnered with the National Academy of Sciences, India announced the award for major scientific areas. Dr. N. Vigneshwaran, Senior Scientist of this Institute was given the SCOPUS young scientist award 2014 in the field of agriculture, based on his contribution in the fields of biological production of nanomaterials, nanofinishing of cotton textiles to impart novel functionalities and energy-efficient nanocellulose production technology. He will be receiving this award at the hands of Dr. Jitendra Singh Hon'ble Union Minister of Science & Technology, on 8<sup>th</sup> September 2014.



Dr. N. Vigneshwaran

## 6. Conferences & Seminars attended

### International meet:

Dr. P. G. Patil, Director CIRCOT participated and presented the paper entitled, "Recent Advances in Cotton Ginning Technology in India" at the 6<sup>th</sup> Meeting of the Asian Cotton Research and Development Network at Dhaka, Bangladesh during 18<sup>th</sup> -20<sup>th</sup> June, 2014. The Cotton Development Board (CDB), Bangladesh with the assistance of Ministry of Agriculture, Bangladesh had hosted the meeting. Under the aegis of International Cotton Advisory Committee, Washington.



Delegates of the international meet

## Seminar:

- ✍ Dr. Kartick K. Samanta, participated in the 'National Seminar on Manufacture, Characterization and Applications of Technical Yarns' held on 4<sup>th</sup> July 2014, at DKTE Institute of Textile and Engineering, Ichalkaranji, Maharashtra, India and presented a paper on "Production and Applications of Electrospun Nanofibres and Yarn".
- ✍ Seminar on Rashtriya Sangoshti: Rashtra ke Badalte Parivesh mein Abhiyantriki Anusandhan evam Vikas ke naye Aayaam" was attended by Dr. S. K. Shukla and Shri. V. G. Arude on July 28<sup>th</sup>, 2014 in Bhopal.

## 7. Human Resource Development

- ✍ Er. A. K. Bharimalla attended the MDP programme on "Harnessing Intellectual Property for Strategic Competitive and Collaborative Advantage" held during June 20-22, 2014 at Indian Institute of Management, Ahmedabad.
- ✍ Dr. Kartick K. Samanta, Scientist attended the training programme on "Application of Electronics in Agriculture and Environment" during 16-27 June, 2014 organized by C-DAC, Kolkata.
- ✍ Smt. N. M. Deshmukh Assistant attended Administration related special training programme during June 9-20, 2014 at New Delhi organized by ISTM, New Delhi
- ✍ Shri P. V. Jadav attended Administration related special training programme during June 30- July 11, 2014 at New Delhi organized by ISTM, New Delhi
- ✍ Dr. S. K. Dey and Dr. P. K. Mandhyan Sr. Scientists attended refresher course at NAARM, Hyderabad on "Agricultural research management for directly recruited senior/principal scientists" during June 4 - 26 June 2014.

## 8. Personnel

### Obituary

Shri. K. S. Bhyrappa (Technical Officer), left for his heavenly abode on 26<sup>th</sup> July, 2014. All CIRCOTIANS offer heart felt condolences on his sad demise.

### Superannuation

Dr. S. J. Guhagarkar (Chief Technical Officer), Shri. R. S. Pathare (Senior Technical Officer) and Smt. V. V. Desai (Assistant Administrative Officer) superannuated from the service w. e. f 31<sup>st</sup> July, 2014.

## 9. Up Coming Events

ICAR-CIRCOT is a pioneering R&D institute on post harvest technology of cotton and serving the stakeholders since 1924. The following specialized training programmes are scheduled during the financial year 2014-15.

S. No.	Name of the training	Duration
1	Better Utilization of Cottonseed	Nov.10-14, 2014
2	Advances in Textile Characterization	Nov.24-28, 2014
3	Basics of Nanotechnology & its Application	Dec.08-12, 2014
4	Training on Cotton Spinning	Jan.05-09, 2015
5	Advances in Microscopy (SEM, AFM, Fluorescent, Polarised)	Jan.19-21, 2015
6	Chemical Characterization of Textile Materials & Auxiliaries	Feb. 02-14, 2015

Information about the course content, fees and other details are available on our website. Apart from above modules, tailor-made training programmes can also be organized on demand.

**Suggestion/ Feedback:** Readers are requested to send their comments/ critics to the following email. id for improving the quality of e-newsletter.  
Email: icarcircot.news@gmail.com

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किसानों का हमसफर  
भारतीय कृषि अनुसंधान परिषद

*Agrisearch with a human touch*

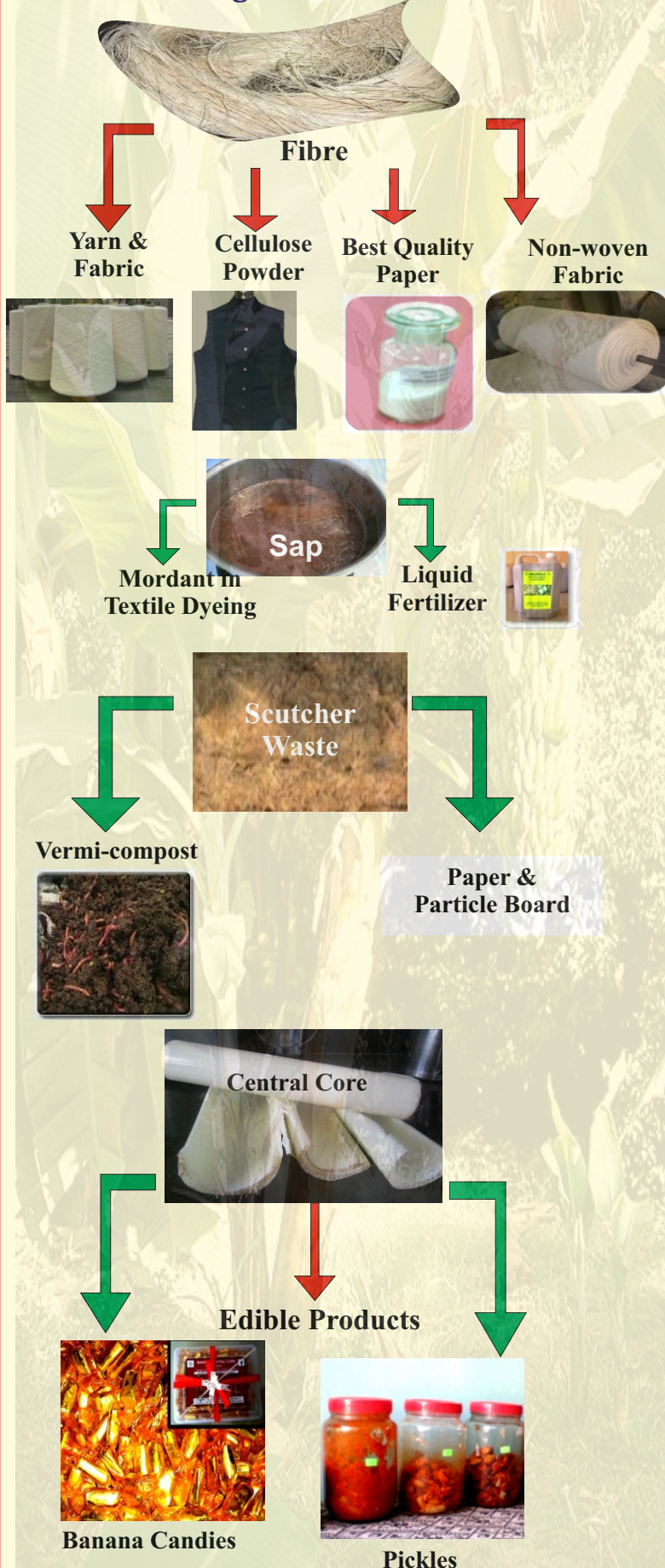


# Technologies developed at ICAR-CIRCOT, under the aegis of NAIP (Component-2)

**A Value Chain for Cotton Fibre, Seed and Stalks : An Innovation for Higher Economic Returns to Farmers and Allied Stake Holders**

**A Value Chain for cotton Fibre, Seed and Stalk: An Innovation for Higher Economic returns to Farmers and Allied Stake Holders**

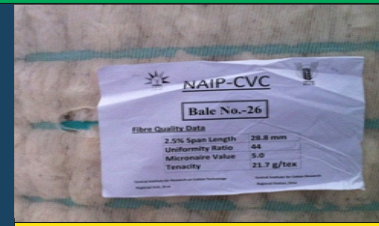
## High Value Products



**Clean Cotton Picking**



**Yarn Production**



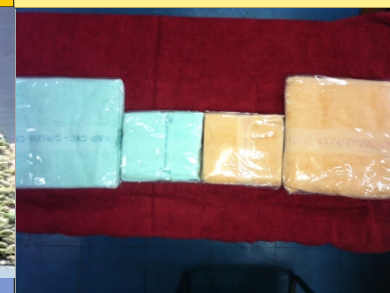
**Bale Tagging**



**Bleached cotton linter**



**Oil Extraction**



**biomass-briquettes**



**Animal Feeds**