

CIRCOT news

Newsletter of the Central Institute for Research on Cotton Technology, Mumbai

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Issue 1

EDITORIAL

Indians have been the forerunners in the use of natural dyes for colouring of textile materials over centuries. More than 450 taxa of colour bearing plants have been documented in the country of which 50 are considered to be commercially important. Beside the dye-yielding characteristics, many of these plants also possess medicinal value. Natural dyes in general are less toxic, less polluting, non-carcinogenic and non-poisonous. Added to this, they are harmonizing colours, gentle, soft, subtle and create a restful effect.

The advent of synthetic dyes completely replaced the use of natural dyes during the last century. Although natural dyes have several advantages, in terms of their renewable nature and ecological compatibility, they are still unable to compete with the synthetic dyes. The chief limitations of the use of natural dyes are non-standard extraction and processing techniques, batch-to-batch colour variation, non-uniform fastness properties and the limited colour range. However, in view of growing ecological concern, there is a revival of interest globally in promoting natural dyes.

It is estimated that total natural dye production in India is in the range of 2 tons per annum. The major areas of application identified are for carpets, silk textiles, leather products, cosmetics and hair dyeing. If we can gear up activity to utilize natural dyes to the tune of 1% of the synthetic dye

production, the economic fall out will be significant. This will benefit the small and medium scale dyeing industries, creating job opportunities in rural and backward regions of the country besides contributing towards foreign exchange earnings.



An assessment of the overall situation calls for the concerted efforts to adopt an integrated approach creating forward and backward linkages from resource base to marketing. The need of the hour is to upgrade the existing dyeing technology with the scientific inputs. There is also a need to address the IPR issues in order to recognize the work done by artisans and tribals in the field of natural dyes and bring economic benefits to them. On the whole, a policy shift is called for to strengthen documentation of natural dyes collected and evolving methodologies for the assessment, characterization and quality improvement techniques. CIRCOT is contributing significantly in this direction to develop protocols for collection and application of natural dyes onto cotton textiles and to characterize the dyes by fingerprinting. CIRCOT is also strengthening its linkages with NGOs and others to achieve a paradigm shift in the field of natural dyeing.

Editorial Committee

**Dr. S. Sreenivasan, Dr. C.D. Ravindran,
Dr. N. Vigneshwaran, Shri V.B. Suryanarayanan
and Shri M. Mohan**

R & D ACTIVITIES

Creep and Inverse Creep Measuring Device

All textile materials are made up of natural or synthetic polymers. Being visco-elastic in nature, they exhibit phenomena like creep and stress relaxation associated with polymer substances. Inverse creep occurs in visco-elastic materials when the applied stress is partially reduced. An instrument has been fabricated to measure creep and inverse creep in textile materials, particularly yarn and filaments. It can measure changes in length to an accuracy of fraction of a millimeter. Measurement is done using ultrasonic transducers attached to computer through a microprocessor. It can take readings every second. Measurements on a number of yarn samples have already been carried out. A patent has been applied for this innovation.

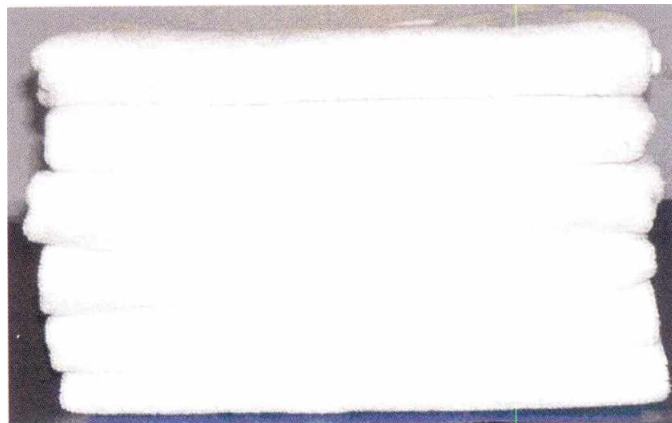
Wear Comfort Studies of Knitted Fabrics

Fabrics of various densities as well as different fine cottons were knitted and analyzed for their physical parameters viz., thickness, air permeability, water vapour transportation and tightness factor. As expected, air permeability of fabrics decreased with increase in density and fineness. Similarly, the water vapour transportation time up to mean relative humidity is more in dense and finer fabrics when compared with less denser and coarser fabrics, respectively.

Enzymatic Bioscouring of Cotton Fibres and Fabrics

A large-scale trial of enzymatic bioscouring of cotton fabrics with pectinase enzyme was made for the preparation of terry towel using yarn prepared from organic cotton procured from a private company. Yarn preparation and

bioscouring treatments were also carried out in a private mill premises. Same conditions were used both in the laboratory as well as in the mill premises.



Bioscoured Terry Towels

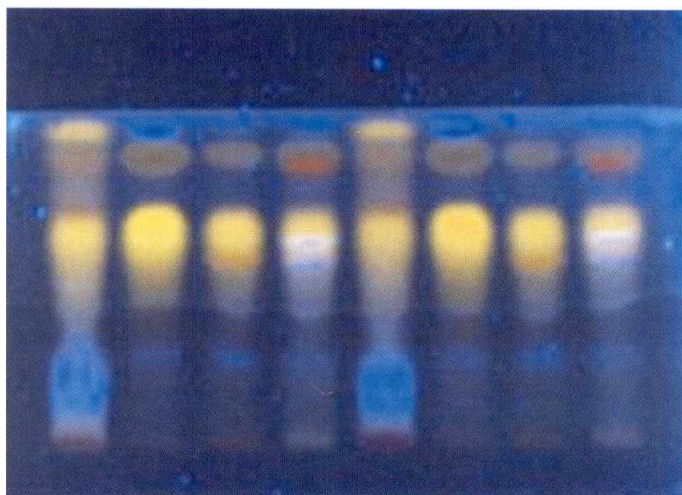
Terry towels prepared using this method had comparable water holding capacity as those prepared by chemical scouring method. The advantage of this method lies in the use of eco-friendly chemicals.

Preparation of Cellulose Powder from Coir Waste

Cellulose powder was prepared from the coir waste (cut fibres) both by chemical and biological method. The coir waste was kiered with 16% alkali (100 °C for 30 min), washed and bleached with sodium hypochlorite in three cycles (3% available chlorine). The bleached material was washed, dried and powdered in a Wiley mill. The yield was around 30%. For biological method, the coir waste was subjected to anaerobic treatment for 7 days after an initial alkali treatment (4% w/w, steamed for 30 min) and bleached with sodium hypochlorite in three cycles (3% available chlorine). The bleached material was washed, dried and powdered in a Wiley mill. Here, the yield of cellulose powder was around 32%. Both chemical and biological methods resulted in good quality of cellulose powder.

Fingerprinting of Natural Dyes

High Performance Thin Layer Chromatography (HPTLC) is a simple and quick technique to know about the various constituents of complex mixtures as these get separated on the HPTLC plate and UV-visible spectra of each constituent can be recorded. Under this project, HPTLC fingerprints of aqueous extracts of *Rubia cordifolia* (manjith) available commercially were developed and these were compared with the HPTLC fingerprints of root and stem extracts of *Rubia cordifolia* growing wild in Chaukul, Maharashtra. It was observed that the intensity of coloured components was much lower in the wild samples. This was later confirmed by actual dyeing of cotton with the extracts.



HPTLC fingerprints under UV light

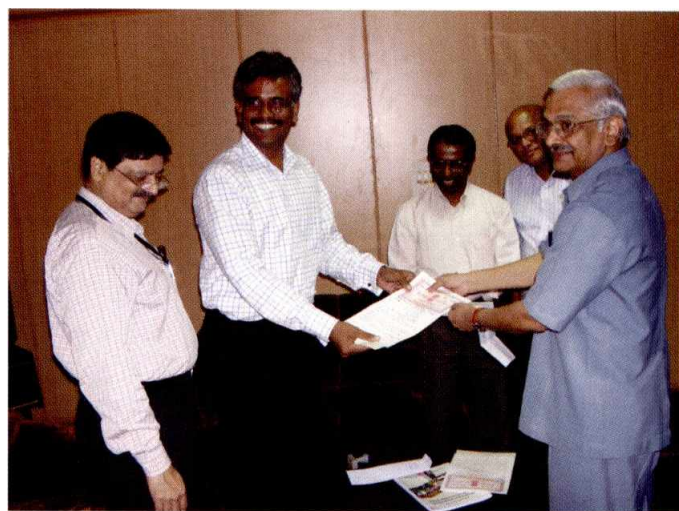
It was also possible to distinguish between root and stem samples and between two species of the same Genus, *Rubia cordifolia* and *Rubia sikkimensis*.

The HPTLC fingerprints could also differentiate extracts of orange and yellow marigold flowers as well as yellow and white chrysanthemum

flowers. Thus this technique has the potential to be developed into quality control tool for natural dyes.

Technology Transferred

A Process on "Synthesis of zinc oxide nanomaterials" has been transferred on non-exclusive basis to M/s. ANABOND Ltd. Chennai on 22nd August 2007 against the technology



Technology Transfer Document being given to Raghavan of M/s. Anabond, Ltd., Chennai

fee of Rupees three lakhs and royalty @ 3% on the cost of production.

In connection with this technology transferred, a demo for the preparation of zinc oxide nanoparticles was carried out. This demonstration yielded 500 g of zinc oxide nanoparticles in a single batch experiment.

Patent Obtained

An Indian patent has been obtained for the process developed by CIRCOT for isolation of anaerobic microorganisms using a new apparatus. (No: 203406)

MEETINGS

Institute Research Council Meeting

The one hundred and seventh IRC meeting of CIRCOT was held on April 19 and 20, 2007. The details about the progress made in different projects of four core areas during the period from April 2006 to March 2007 were discussed.



Discussion during the 107th IRC meeting of CIRCOT held on April 19 and 20, 2007

The following new projects were approved:

Core Area I:

1. Development of Techno-economically viable cottonseed delinting process to recover linters.
2. Post TMC performance monitoring of the ginning factories in the cotton belt of India.
3. Study of Bale storage and handling practices to changing environment and its effect on lint quality at different layers in cotton bale.
4. The performance evaluation of cyclones used in modern ginneries.

Core Area II:

1. Demand model for the consumption of cotton fibre in textile sector.

Institute Management Committee Meeting

The Sixty-fifth meeting of the Institute Management Committee (IMC) of CIRCOT was held on 10th August 2007 in the Committee Room. Dr. S.Sreenivasan, Director was in the Chair and Dr. Pitam Chandra, Assistant Director General (P.E.), ICAR, Shri Suresh Varpudkar (Nominated by Agri. Minister) Member, Dr. M.R.K. Rao, Principal Scientist, CICR, and Dr. J. Prasad, Principal Scientist, CIAE, Bhopal were the Members.



Discussion during the 65th IMC of CIRCOT on 10th August 2007

The chairman highlighted CIRCOT's achievement in successful completion of calibration cotton project in ten years and receipt of *Rajarshi Tandon Puraskar* award for carrying out commendable work in Hindi for the year 2005-06 among the ICAR Institutes in the Central Zone. After discussion on various agenda, the Vision 2025: CIRCOT Perspective Plan was released by Dr. Pitam Chandra, Assistant Director General (P.E.), ICAR and Annual Report (2006-2007) of CIRCOT was released by Shri Suresh Varpudkar, Member on this occasion.

National Seminar on Emerging Potential of Cottonseed and its By-products

The Indian Society for Cotton Improvement in collaboration with CIRCOT and AICOSCA organized a one-day National Seminar on Emerging Potential of Cottonseed and its By-products on April 10, 2007 at Jubilee Hall, CIRCOT. India is losing cottonseed by-products worth about Rs.2500 crores every year including about 5 lakh tones of cottonseed oil and that too at a time when about 50% of our vegetable oil requirement is met through import. With this background, this seminar was organized to provide a platform for the concerned organizations to deliberate and formulate strategy for gainful utilization of cottonseed and its by-products.



Release of publications by Dr. Mangala Rai and colleagues during the national seminar on Emerging Potential of Cottonseed and its By-products on April .10, 2007

Dr. S. Sreenivasan, Director CIRCOT welcomed the gathering, introduced the Chief Guest Dr. Mangala Rai, Secretary DARE and Director General, ICAR, apart from brief introduction about the status of cottonseed in India. The Guests released four booklets on this auspicious occasion. Dr. R. H. Balasubramanya, Chairman,

ISCI requested Dr. Mangala Rai for inclusion of oil content in cottonseeds during the variety release that was later acceded to. Shri. O.P. Goenka, Director, M/s. Food, Fats & Fertilizers Ltd., Hyderabad presented the keynote address with a focus on the relative status of oil palm in comparison with cottonseed oil. Shri. Sandeep Bajoria, Chairman AICOSCA presented the status of cottonseed oil in India with special emphasis on its increasing use in Gujarat. Also, he requested that the importance of cottonseed oil be emphasized in the Government policies. Dr. Nawab Ali, DDG (Engg), ICAR briefly introduced the need to incorporate cutting edge technologies like Nanotechnology and Biotechnology for the improvement of cottonseed by-products utilization. Dr. Mangala Rai presented the inaugural address with the explanations for the queries raised. His view was that the introduction of Bt gene had no effect on the yield of cottonseed oil and the cottonseed and lint are not mutually exclusive, genetically. Though India could grow all the four species of cotton best in terms of cost of production, lack of scientific processing and handling lowers the income to farmers. He also pointed out the need for road map, strategy and public-private interaction for proper utilization of cottonseed by-products in the future. Dr. P.V.Varadarajan, Secretary, ISCI proposed the vote of thanks to all those involved in organization of this seminar. This was followed by three technical sessions including cottonseed oil production scenario, cottonseed by-products and roadmap of cottonseed utilization in India. Based on the daylong deliberation few research targets were set in order to harness the potential of cottonseed and its by-products. They are to improve the oil recovery by 20%, promote the varieties that does not contain gossypol in seeds, recovery of gossypol from meal and finding an alternative use for it, production of bio-enriched products from hull, explore various uses of linters and optimization of the processing units.

NAIP Stake Holders Workshop

A half-day workshop was organised by CIRCOT to interact with the various stake holders in the proposed NAIP project *A Value Chain for Cotton Fibre, Seed and Stalks : An Innovation for Higher Economic Returns to Farmers* on July 20, 2007 at the Jubilee Hall of the Institute.



Dignitaries on Dais during NAIP Stake Holders Workshop on 20th July, 2007.

Shri Suresh Kotak, Chairman, Kotak Research Foundation and a well-known personality in the field of cotton textiles was the Chairman of the Workshop. Dr. J.B. Mittal, National Director, NAIP, New Delhi, Dr. Pitam Chandra, ADG (P.E.), ICAR, New Delhi, Dr. K.R Krishna Iyer, Retd. Director, CIRCOT and presently Consultant, CCI, were the Experts on this occasion. The workshop was well attended by eminent persons from the textile trade and industry, Retd. Directors from CIRCOT and CICR, Nagpur, Scientists from CICR, Nagpur, CoPIs from Super Spinning Mill, Coimbatore, and Natural Dye Resources, Mumbai, Scientists and Technical Officers from CIRCOT. Dr. R.P. Nachane, Principal Scientist and Head, Quality Evaluation & Improvement Division, CIRCOT and Principal Investigator of the consortium of the project from the Lead Institute dwelt at length on his consolidated proposal made in consultation with all the stake holders. He categorically

identified the key technology gaps in the supply chain between the farmer and the end user, the likely intervention at different stages in order to fill-in the existing gaps so that the chain becomes stronger and valuable, in his presentation. The following are some of the points that emerged after these discussions.

- Reducing the trash content further down i. e below 1 %.
- Importance of manual picking of cotton as the best practice, which have to be stressed to farmers.
- Demonstration of appropriate picking models to the farmers to reduce the contamination and picking of the yellow bolls.
- Processing is the weak link in this value chain and needs to be addressed properly; since UV finishing in fabrics are not permanent, use of natural dyes for imparting this value addition is to be thought of.



Discussion of stakeholders on 21st July

Third Review Meeting on Utilisation of Cotton Plant By produce for Value Added Products

The Third Review Meeting on the CFC funded project was held on 25th May 2007 at the Ginning Training Centre of CIRCOT at Nagpur under the Chairmanship of Dr. S.Sreenivasan,

Director, CIRCOT. Dr. Pitam Chandra, ADG (PE), ICAR, New Delhi, Dr. R.P.Kachru, Former ADG (PE), ICAR, Dr. B.M.Khadi, Director, CICR, Nagpur, Dr. N. Gopalakrishnan, PC (Cotton), Coimbatore, Mr. V.S.Raju, CMD, Ecoboard Industries Ltd., Pune were present with other dignitaries. All members visited M/s Shivdhan Boards, Borkhedi about 35 km from Nagpur. After this, they visited ITPD Demonstration plant set up under the CFC programme at GTC, Nagpur and the working of all the units were shown. The recently installed 160 KVA Gen Set and the boiler and dust collection system of the demonstration plant were also inspected by the members. The members also witnessed the demonstration of the cotton stalk cleaning system. Dr. R.H.Balasubramanya, P.I. and Head, Chemical and Biochemical Processing Division made a brief presentation on the logistics of cotton stalk supply chain, cotton stalk cleaning system, standardisation trials in the Demonstration plant, soft board trials, briquetting trials etc. including a proposal for a 20 TPD plant. The suggestions made by Hon. Members were discussed in detail.

ICAR Foundation Day

ICAR foundation day was celebrated on 16th July 2007. During this occasion, various activities were



College students viewing CIRCOT's technologies

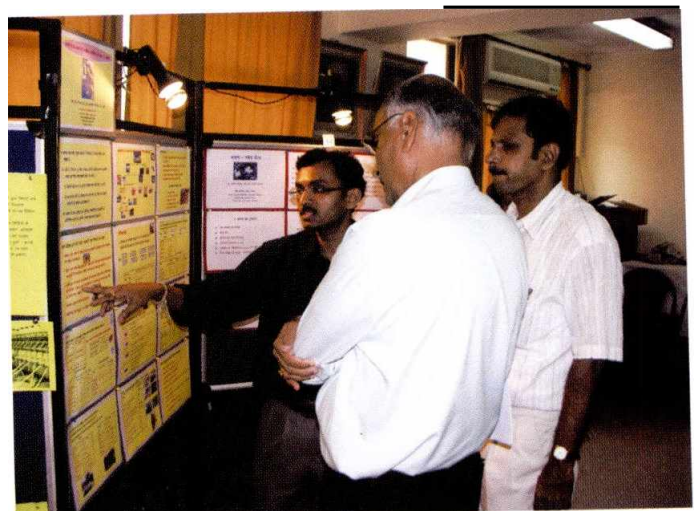
organized for CIRCOT staff and an exhibition was arranged for the outsiders. Students from nearby colleges visited this exhibition and had live experience about CIRCOT's technologies.

Hindi Day / Fortnight Celebration

Hindi day/fortnight was celebrated at the Institute between 5th and 14th September, 2007. The celebrations were inaugurated by the Chief Guest Dr. Suresh Sharma, Sr. Assistant Editor, Navbhart Times on 5th September 2007. In the presence of the chief guest, two competitions namely 'Aashubhashan' and 'Kavita Pathan' were held.



Inauguration ceremony in progress



Hindi poster competition

Dr. R.H. Balasubramanya, Acting Director presented the welcome address.

In the ten days that followed, various competitions like Technical Vakyansh, Essay-writing, Phrases and their uses, Poetry Composing, Cross-Word, Bees Sawal, Poster Presentations, Antakshari etc. were conducted and more than 100 staff members took active part in the contests.

The closing day function of the celebration was presided over by the Chief Guest Dr. Indira Shukla, Principal, Gokhale College of Education and Research. Dr. A.J. Shaikh, Chairman, Hindi Organizing Committee presented a brief account of the competitions carried out in the Institute during the ten days. Dr. R.H. Balasubramanya, Rajbhasha Adhikari, read out the proceedings of the various activities carried out and progress made in implementation of official language during the year.

Hindi Week Celebration at GTC, Nagpur

The Hindi Week was celebrated at the GTC, Nagpur between 14th to 20th September 2007 with great enthusiasm. The Chief Guest Mr. Dinesh Chandra Sharma, Assistant Director (OL), Hindi Training Scheme, Nagpur and Special Guest Dr. Mahendra Kumar Shahu, Sr. Hindi Translator, National Bureau of Soil Survey and Land Use Planning inaugurated the celebrations on 14th September, 07. In the week days that followed, various competitions like Geet Gayan, Phrases and their uses, Noting-Drafting, Essay Writing, etc. were conducted. Twenty-two staff members took active part in the contests.

The closing day of the celebration was presided over by two special guests, Dr. S.G. Gupta, Principal Scientist of National Research Centre for Citrus and Shri. Sachin Agnihotri, Administrative Officer from National Bureau of Soil Survey and Land Use Planning.

Hindi Workshop

A Hindi workshop was held on 3rd and 4th August 2007 at CIRCOT for all Technical Officers.

Shri Harshmohan Krishna was the chief guest. The topics of discussion were "Vigyan Avam Takniki Ke Pariprekha Main Bharatiya Bhashayen" and "Karyalayeen Hindi Avam Vyavaharik Kathinaiyen".



Hindi Workshop on 3rd August 2007

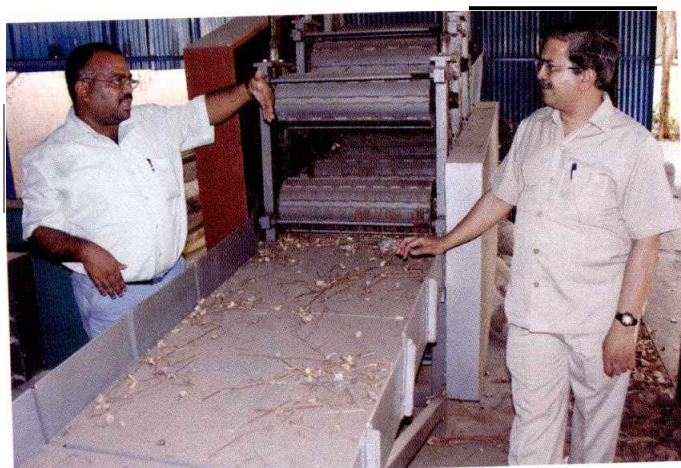
Dignitaries' Visit

Mr. A.K. Upadhyay, Addl. Secretary, DARE & Secretary, ICAR visited CIRCOT on 4th April 2007.



Mr. Upadhyay inspecting the fabrics coloured with natural dye

Dr. R.T. Patil, Director CIPHET, Ludhiana visited CIRCOT on 28th May 2007.



R. T Patil's visit to CIRCOT

The Honorable Minister of State for Agriculture Shri. Kanti Lal Bhuria visited CIRCOT along with Shri. Pravin Kakkad, OSD to Minister and Dr. Anupam Bark, Director, DOCD, Mumbai on 19th



Warm Welcome to the Hon'ble Minister



Explaining various activities of CIRCOT to the Hon'ble Minister

September 2007. Dr. S. Sreenivasan, Director explained them the various research and development activities being carried out at CIRCOT.

Dr.V.Sundaram Memorial Lecture and Dr. V. Santhanam Special Prize

The Third Dr. V. Sundaram Memorial Lecture was delivered by Shri. R. Krishnamoorthy, Resesarch Director, Rasi Seeds Ltd. Attur on 16th June 2007. His lecture was on breeding for fibre quality improvement of cotton. He discussed about the milestones and achievements by the Government Agencies and private agencies in cotton fibre quality improvement in the past decades. He emphasized the need for improvement of fibre quality to meet the future requirements of extra long staple cottons. He also insisted on the need to use Bt gene in extra long staple cottons. On this occasion, Dr. V. Santhanam Special Prize (Team Award) was given to Dr. R.H. Balasubramanya and his team Dr. A.J. Shaikh, Mr. R.M. Gurjar, Dr.P.V. Varadarajan, Dr. K.M. Paralikar, Dr. P.G. Patil and Dr. S. Sreenivasan.



R.H. Balasubramanya and his team members receiving Dr. V. Santhanam Special Prize (Team Award) from Dr. I.P.S. Ahlawat, Vice-Chancellor, Nansari Agricultural University, Gujarat

PERSONNEL

Promotion

- Shri. Chitranayak was promoted as Scientist (Senior Scale) w.e.f. 30-06-2006.

Transfer

- Shri. H.N. Hedau (T-5) was transferred from CIRCOT, Mumbai to GTC, Nagpur and Shri. Sawarmal Saini (T-1) was transferred from CIRCOT, Mumbai to Sirsa.

Retirement

- Smt. Prema Nair (Senior Scientist), Dr. G.F.S. Hussain (Principal Scientist), Shri. M. Ahmed (Principal Scientist), Shri. M.Z. Bhagat (MO) and Shri. T.B. Khan (SS Gr.III) retired on Superannuation.

Training Programme Attended by Staff

- Shri. Venu Thanikal attended the Workshop on Professional Development on 16-20 April 2007 at ISTM, New Delhi.
- Shri. M.B. Khubdikar and Smt. M.V. Kamerkar attended the National Workshop on Right to Information Act — 2005 on 15-16 June 2007 at IIPA, Bangalore.
- Shri. M.B. Khubdikar and Smt. M.V. Kamerkar attended the National Convention on Right to Information Act — 2005 on 2-4 July 2007 at IIPA, Bangalore.
- Shri. S.V. Kasabe attended the Workshop on Pensions and Other Retirement Benefits on 16-20 July 2007 at ISTM, New Delhi.
- Shri. M.B. Khubdikar and Smt. T.P. Mokal attended the Workshop on Official Language on 31 August and 1 September 2007 at IIPA, Bangalore.
- Shri. S.V. Kasabe and Shri. J.R. Mangale attended the training on Finance Management

on 19-21 September 2007 at Centre for Training and Social Research, New Delhi.

- Er. A.K. Bharimalla attended the AUTOCAD training from 4 to 24 September 2007 at IDEMI, Mumbai.

Foreign Deputation

- Dr. R.P. Nachane attended the Programme on "Study in the field of cotton improvement & Quality Assurance" under ICAR-ARC Egypt Work Plan for 2007-08 from 18 -31, May 2007 at ARC, Egypt.
- Dr. S.K. Chattopadhyay participated in the Training in "Cotton Processing for Superior Quality Yarn" under the Indo-Egypt Work Plan for 2007-08 from April 1-June 15, 2007 at ARC, Egypt.
- Dr. Sujata Saxena participated in the Training on "Evaluation of Protective Clothing for Pesticide Applications" during 18-29, June 2007 at University of Maryland Eastern Shore, USA.
- Dr. P.G. Patil attended the World Cotton Research Conference from 10-14, September 2007 in USA.

PUBLICATIONS

A. Research papers published in journals

- N. Vigneshwaran, A.A. Kathe, P.V. Varadarajan, R.P. Nachane, and R.H. Balasubramanya, *Silver-Protein (Core-Shell) Nanoparticle Production Using Spent Mushroom Substrate*, **Langmuir**, 23 (13) (2007) 7113 -7117
- S.B. Jadhav and K.M. Paralikar, *Optimizing the frequency of oscillating beater in double roller gin*, **Indian Journal of Fibre and Textile Research**, 32 (2007) 184-188

- D. Blaise, C.D. Ravindran and J.V. Singh *Effect of nutrient management practices on growth, fruiting pattern and yield of Asiatic cotton (Gossypium arboream L) J. Plant Nutrition and Soil Science*, 170 (2007) 1-8
 - S.G. Gayal and C.D. Souza, *Enzymatic Hydrolysis of cottonseed meal for simultaneous oil extraction and preparation of protein hydrolysate*, **Journal of Indian Society for Cotton Improvement**, 32(1) (2007) 65-69
 - S. Chandramouleeswaran, S.T. Mhaske, A.A. Kathe, P.V. Varadarajan, Virendra Prasad, and N.Vigneshwaran, *Functional behaviour of polypropylene/ZnO-soluble starch nanocomposites*, **Nanotechnology**, 18 (2007) 385702 (8pp)
 - A. Yadav, R.P. Nachane and G.F.S. Hussain, *Air permeability of different layers of woven fabrics* **Journal of Polymer Materials**, 24(2) (2007), 113-118
 - Chitranayak and A. Yadav, *Vastra Uddyog Mein Kapas ka Mahatva*, **Vastra Paridhan**, 62 (2007), 28-29
- B. Research papers presented in seminars and conferences**
- S. Sreenivasan, *Competitiveness and prospects of Indian Cotton for Diversified Applications*, **Advances in textiles, machinery, non-woven & technical textile - 2007**, Coimbatore 18-20, June 2007.
 - A.A. Kathe, Virendra Prasad, C. Sundaramoorthy, A. Yadav, N. Vigneshwaran, *Application of ZnO nanoparticles for antibacterial finishing of cotton*, **Advances in textiles, machinery, non-woven & technical textile - 2007**, Coimbatore 18-20, June 2007.
 - C. Sundaramoorthy, A.K. Bharimalla, S.K. Chattopadhyay, *Competitiveness and stability of India's cotton yarn trade in the changing global textile trade regime*, **Advances in textiles, machinery, non-woven & technical textile - 2007**, Coimbatore 18-20, June 2007.
 - Pratap Patil, R.P. Nachane, *Measurement of Inverse Creep in Nylon Multifilament Yarn*, **Advances in textiles, machinery, non-woven & technical textile - 2007**, Coimbatore 18-20, June 2007.
 - K. Parthasarathi, S.P. Borkar, A.A.Kathe, Virendra Prasad, N. Vigneshwaran, *Functional Behaviour of Cotton Textiles coated with Nano-TiO₂*, **Advances in textiles, machinery, non-woven & technical textile - 2007**, Coimbatore 18-20, June 2007.
 - G.F.S Hussain, R.P. Nachane, A.J. Shikh, *Database on Physico-Chemical and Structural Characteristics of Coconut Fibre*, **International coconut summit 2007**, Kochi. 7-11, May 2007.
 - R.H. Balasubramanya and A.J. Shaikh, *Value Addition to Cottonseed By-products*, **National Seminar on "Emerging potential of cottonseed & its by-products"** on 10th April 2007.
 - P.G. Patil, *Cotton Plant Stalk - An Alternate Raw material to Board Industry*, **World Cotton Research Conference**, USA from 10-14, September 2007.
- C. Other publications**
- Booklet on *"Scientific Processing of Cottonseed and Value Addition to its By-products"*, by N. Vigneshwaran, R.H. Balasubramanya and A.J. Shaikh, 2007.
 - *CIRCOT News* - Vol. 9(2), October 2006 to March 2007.
 - *CIRCOT Ginning Bulletin*-Vol. 7(1), April 2006 to October 2006.

HANDBOOK OF METHODS OF TESTS

The following two volumes are published by CIRCOT covering the whole spectrum of test methods from fibre to fabric.

Handbook of Methods of Tests for Cotton Fibres, Yarn and Fabrics

Part I : Ginning Tests, Fibre Tests, Moisture Tests and Structural Tests

Part II: Mechanical Processing, Yarn Tests and Fabric Tests

The cost is Rs. 200/- each + postal charges extra. Please contact the Director, CIRCOT, Mumbai for copies.

CIRCOT CALIBRATION COTTON

CIRCOT is offering indigenously prepared Calibration Cotton Standards having quality characteristics similar to those of USDA Calibration Cottons.

Two sets of calibration cotton standards are available:

- One set comprises four samples coded D-2 and E-6 for conventional instruments such as Fibrograph, Micronaire and Stelometer
- The second set consists of six cottons coded as HM-8, HC-3, HD-3, HE-7 and HIm-2.

The net weight of each sample is 200 g and the cost is Rs.750/-. A rebate of Rs. 125/- per sample (excluding HIm) is offered for the purchase of 4 or more (same or different cottons including HIm) samples at a time. The cost of HIm (Mic only cottons) is Rs.300/- per container.

ANNUAL COTTON QUALITY UPDATE

CIRCOT has been furnishing authoritative data on the technological properties of Standard and Trade varieties of cotton every year. The globalisation of economy and stringent quality norms required to be met by exporting units have made cotton trade and spinning industry realize the importance of objective testing of raw material. In view of the demand from textile industry and trade CIRCOT publishes the **Annual Cotton Quality Update** every year. The update containing information on essential fibre quality characteristics of varieties under commercial transactions is available well within the cotton season of that year. Apart from the fibre quality parameters, ranges and mean values for each property, frequency distributions for length, length uniformity, fineness and strength are also provided in the update. Highlights of statistical data are also given.



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