



Global Excellence in Cotton Technology Monthly Bulletin, Volume 03, March 2026

Technology of the Month

Production of furfural from cottonseed hulls

A technology has been developed for the efficient production and analytical quantification of furfural from cottonseed hull. The process involves size reduction of cottonseed hulls, followed by optimized hydrothermal pretreatment in a high-pressure, high-temperature reactor to enhance pentose sugar release and promote furfural formation. Process parameters were systematically optimized using Response Surface Methodology (RSM) to maximize conversion efficiency and product recovery. Subsequent distillation of the pentose-rich hydrolysate enabled the effective recovery of high-purity furfural. Spectrophotometric and HPLC-based methods were developed and validated for accurate and reliable detection and quantification of furfural. The optimized process achieved 99% furfural purity (HPLC-validated) with an overall yield of 23.72% from the hemicellulose present in cottonseed hulls, whereas the conventional method resulted in a yield of 14.5%. This technology offers a value-added solution for the sustainable utilization of cotton processing by-products, thereby supporting circular bioeconomy initiatives for green chemical production.

Training Organized



A three-day farmers' training programme on "Post-Harvest Handling, Quality Evaluation and Value Addition to Cotton and its By-products" was organized under the SCSP scheme from March 11–13, 2026, at ICAR-CIRCOT, Mumbai. Sixteen farmers attended the programme.



A three-day training programme for farmers on "Cotton Quality Parameters and Value Addition to its By-products" was organized under the SCSP scheme from March 16–18, 2026, at GTC, Nagpur. Twenty-five participants attended the programme.

Awareness Programme



The Ginning Training Centre, ICAR-CIRCOT, Nagpur organized an awareness programme for farmers on “Best Post-harvest Management Practices for Clean Cotton Production” under SCSP on March 25, 2026. Fifty participants attended the programme.

Event Organized



The Ginning Training Centre, Nagpur organized live streaming of the programme on the release of the 22nd installment of PM-KISAN Samman Nidhi by the Hon'ble Prime Minister on March 13, 2026. Forty Six participants attended the programme. The event was also telecast live and attended by all staff at ICAR-CIRCOT Headquarters and its regional units.



The Internal Complaints Committee (ICC) of ICAR-CIRCOT, Mumbai organized a lecture on “Sexual Harassment at Workplace: From Silence to Safety”, delivered by Dr. Zarin Sethna, Associate Professor (Retd.) and Clinical Psychologist, on March 26, 2026. Sixty participants attended the programme.

The Institutional Biosafety Committee of ICAR-CIRCOT, Mumbai, organized a meeting in hybrid mode on March 11, 2026, to ensure the safe handling of hazardous microorganisms, genetically modified organisms (GMOs), and recombinant DNA (rDNA) materials.

HRD Programme



ICAR-CIRCOT, Mumbai organized hindi workshop titled “Vandemataram, Sardar Patel aur Hindi ki Shatkiya Yatra” was organized in hybrid mode on March 06, 2026, and conducted by Dr. Rajeshwar Uniyal, Retd. Dy. Director (Rajbhasha), ICAR-CIFE, Mumbai.

- Ms. Shalaka Shirish Kalamnurikar, carried out Ph.D. (Agricultural Engineering) work under Dr. D. M. Kadam (Co-Guide) at ICAR-CIRCOT, successfully submitted and defended her thesis titled “Development of Value-Added Cotton Meal Isolated Protein-Based Nutri Product” in the subject of Processing and Food Engineering at Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani.

Publication

Research Paper

- Murmu, S., Chaurasia, H., Sharma, S., Das, R., Farooqi, M. S., and Jha, G. K. (2026). PM-BioPred: A web server for prediction of compound bioactivity against plant and microbial proteins. *Journal of Molecular Biology*, p. 169763. (NAAS: 10.5, IF: 4.5)
- Mansuri, S. M., Gautam, P. V., Kushwaha, H. L., Poonia, S., Bijarniya, H., and Prakash, O. (2026). Development of a portable and low-cost modular solar dryer with interlocking panels. *Journal of Agricultural Engineering (India)*, 63(1), 97–109. <https://doi.org/10.52151/jae2026631.1998> (NAAS: 5.85)
- Pandiyan, K., Kushwaha, P., Karthikeyan, N., Singh, A., and Saxena, A. K. (2026). Prospecting *Streptomyces* spp. isolated from tomato rhizosphere for biocontrol and plant growth promotion. *National Academy Science Letters-India (Accepted)*. (NAAS: 7.30)
- Vinuthana, V. H., Subramaniam, S., Raja, A. S. M., Shukla, S. K., Gnanachitra, M., Ramesh, D., HariPriya, S., Chandrakumar, K., and Uthandi, S. (2026). Optimization and characterization of high-level thermostable xylanase produced from *Aspergillus fumigatus* PSF1 cultivated on wheat bran using response surface methodology. *Discover Applied Sciences*.

Technical / Popular Article

- Shukla, S. K., Raja, A. S. M., Prabu, G. T. V., and Arputharaj, A. (2026). Kasturi Cotton Bharat – Pinnacle of superior Indian cotton. *SIMA Review*, XXXI(1), 15–21.

Patent Granted

- A patent titled “Air Cooling and Circulating System for Improving Thermal Comfort of Impermeable Apparels” has been granted (Patent No. 583954).

Patent Applied

- A patent titled “Cotton Ginning Roller with Moulded Rubber Discs on Hollow Cylindrical Shaft” has been applied (Application Number: 202621020287).

Poster Presented

- Dr. Jagajanantha P., Dr. Kirti Jalgaonkar, Dr. Sharmila Patil, Dr. A. S. M. Raja, Dr. S. K. Shukla, and Dnyaneshwar Choudhary presented a poster titled “Portable Instrument to Measure Cotton Quality at Farm Gate and Textile Industries” at the AgroSpectrum Technovate–2026 conference, organized by the AgroSpectrum Foundation at the CIDCO Exhibition & Convention Centre, Vashi, Navi Mumbai, during March 12–13, 2026.
- Er. Rohit Sudhakar Ghosare, JRF (RGSTC Project), presented a poster titled “Prospects of On-Farm Seed Cotton Baling Technology for Improving the Cotton Value Chain in India” under the theme “Agri Research Innovations and Technology” at the AgroSpectrum Technovate 2026, held at Vashi, Navi Mumbai, on March 12, 2026, and was awarded First Prize.

Recognition

Dr. S. K. Shukla, Director, ICAR-CIRCOT invited for the following events,

- As Chief Guest for the event “Enabling Entrepreneurship Ecosystem in Fisheries (E3F): Stakeholders’ Meet and Policy Roundtable Conference” at CIFE, Mumbai, on March 11, 2026.
- As invited speaker in the CEO Conclave titled “Future of Farming: Technology, Innovation and the Role of Industry Leaders” during AgroSpectrum Technovate 2026, held on March 12–13, 2026 at the CIDCO Convention and Exhibition Centre, Navi Mumbai.
- As lead Presenter in the session titled “Precision Ginning & Quality Assurance: Delivering Premium Fibre to the World” during the Chintan Shivar on “Cotton: A Strategic Framework for Doubling Cotton Productivity and Augmenting Quality Fibre”, held on March 14, 2026 and organized by the Cotton Corporation of India Ltd. (CCI) at Nagpur.
- Dr. Shekh Mukhtar Mansuri delivered an invited lecture on March 24, 2026, at a farmers’ mela organized by CITI-CDRA at Anjansingi, Amravati.

MoU & Consultancy

- A tripartite MoU was signed on March 05, 2026 at ICAR-CIRCOT for five years under the CRP on Water, for “Collaborative research on design, development, and implementation of technical rubber composite sheets for rubber dams and pond/canal lining materials”, with ICAR-IIWM, Bhubaneswar, Odisha, and the Indian Rubber Materials Research Institute (IRMRI), Thane.
- The CCI consultancy project entitled “Study on State-wise Ginning Outturn during the Cotton Season 2025–2026” has been completed. A total of 156 trials were conducted in ginning factories, comprising 21 trials in the North Zone, 43 trials in the Central Zone, and 47 trials in the South Zone.

External Funded Project Sanctioned

- A collaborative project titled “Pharmaceutical Development of Textile-Based Novel Medicated Dressings (Ayush J, Ayush JM, Ayush JTM) for Wound Healing from Classical Ayurvedic Formulations” (Project Code: CPC0009) has been sanctioned by the Ministry of AYUSH, Government of India for the period of 2026-2028, with a budget outlay of ₹41.54 lakhs .
- A project titled “Development and Techno-Commercial Analysis of Agro-Biomass Based Torrefied Pellets with Desirable Volatile Matter for Power Plant Applications” (Code: NPP/21-26/TH/13) has been sanctioned for funding under the National Perspective Plan (NPP) Scheme of the Ministry of Power, Government of India, through the Coordinating Organization CPRI, Bengaluru, for the period 2026–2028, with a budget outlay of ₹63.15 lakhs.

Participation in Events

- ICAR-CIRCOT R-ABI participated in SAMARTH 2026 – Empowering the Incubators Workshop, organized by ICAR at the NASC Complex from March 19–20, 2026.

Revenue Generation 2025-2026

- ICAR-CIRCOT achieved its highest-ever revenue generation of ₹4.74 crore through consultancy, testing, training, and related activities.

Industry Meet

- Dr. N. Shanmugam, Dr. A. Arputharaj, and Dr. T. Senthilkumar participated in the stakeholders' consultation on the National Fibre Scheme, organized by the Ministry of Textiles on March 14, 2026 in Mumbai.

Educational Visits

- A group of 246 students from Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram, visited the institute on March 02, 2026.
- A total of 166 students from the College of Agriculture, Vijayapura, University of Agricultural Sciences, Dharwad, visited the institute in three batches.

Meeting Attended

- The Institutional Biosafety Committee of ICAR-CIRCOT, Mumbai held its meeting in hybrid mode on March 11, 2026 to ensure the safe handling of hazardous microorganisms, genetically modified organisms (GMOs), and recombinant DNA (rDNA) materials.
- Dr. N. Shanmugam, Head, MPD, participated as a member in the 77th meeting of the Institute Management Committee of ICAR-NINFET, held in Kolkata on March 18, 2026.
- The Startup Selection & Investment Committee (SIC) meeting was conducted on March 24, 2026 by the ICAR-CIRCOT RKVY-RAFTAAR Agri-Business Incubator, Mumbai, in collaboration with KRISHIK Agri-Business Incubator, Mumbai.

Superannuation

- Dr. (Smt.) Sheela Raj, Chief Technical Officer, Engineering Technology Transfer Division (ETTD), ICAR-CIRCOT, Mumbai, superannuated on February 28, 2026.



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