Proceedings of the 28th Meeting of the RESEARCH ADVISORY COMMITTEE (RAC) of ICAR-CIRCOT, Mumbai

Held in Hybrid mode on 9th & 10th May, 2022

Chairman and Members of RAC (2020-2023)

Dr. N. C. Patel, Chairman

Dr. M. K. Sharma, Member

Prof. (Dr.) U. J. Patil, Member

Prof. (Dr.) S. R. Shukla, Member

Dr. N.N. Mahapatra, Member

Dr. Narendra G. Shah, Member

Dr. A. K. Thakur, Member

Dr. Sujata Saxena, Member

Dr. V. G. Arude, Member Secretary



ICAR-Central Institute for Research on Cotton Technology Adenwala Road, Matunga, Mumbai-400019, M.S., India

May, 2022

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28th RAC Meeting of CIRCOT (9th & 10th May, 2022)

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Proceedings of the 28th Research Advisory Committee (RAC) Meeting held in Hybrid mode on 9th & 10th May 2022

The 28th (Twenty Eighth) meeting of the Research Advisory Committee (RAC) of ICAR-CIRCOT, Mumbai was held in Hybrid mode on 9th and 10th May 2022. Dr. N. C. Patel, Former Vice Chancellor, Junagadh Agricultural University and Anand Agricultural University and Chairman, RAC presided over the meeting and following members were present.

- **Dr. M. K. Sharma**, Whole Time Director & CEO, M/s. Bajaj Steel Industries Ltd, Nagpur
- **Prof.** (**Dr.**) **U. J. Patil**, Head, Department of Textiles, D.K.T.E. Society's Textile and Engineering Institute, Ichalkaranji
- **Prof.** (**Dr.**) **S. R. Shukla**, Former Professor, Institute of Chemical Technology (ICT), Mumbai
- **Dr. N.N. Mahapatra**, Business Head (Dyes), Shree Pushkar Chemicals & Fertilizers Ltd, Mumbai
- **Dr. Narendra G. Shah**, Professor, Centre for Technology Alternatives for Rural Areas (CTARA), IIT, Mumbai
- Dr. A. K. Thakur, Principal Scientist (Agricultural Engineering Division), ICAR, New Delhi
- Dr. Sujata Saxena, Director, ICAR-CIRCOT, Mumbai
- Dr. V. G. Arude, Senior Scientist and Member Secretary, RAC, ICAR-CIRCOT, Mumbai

Dr. V. G. Arude, Member Secretary, RAC greeted the Chairman and all the honorable members of Committee and other participants.

Chairman and all RAC members except Dr. M. K. Sharma, attended the RAC meeting physically on first day. Dr. M. K. Sharma joined meeting in Virtual mode on both the days. Dr. N. N. Mahapatra and Dr. N. G. Shah attended meeting virtually on second day.

All Head of Divisions and scientists of the institute attended the meeting physically. Scientists at GTC, Nagpur attended the meeting virtually.

The list of participants is given in Annexure-1

The meeting proceeded as per the agenda items (Annexure-2)

The photo gallery of RAC meeting is given in Annexure -3

1. Welcome to Chairman and Members of RAC

Dr. Sujata Saxena, Director, ICAR-CIRCOT welcomed the Chairman & Members of RAC for the 28th meeting, the third and the last meeting during the three years tenure (2020-23) of the present committee with a bouquet of flowers.

2. Presentation of Major Research Achievements of the Institute

Dr. Sujata Saxena, Director, ICAR-CIRCOT presented the major research achievements and other activities for the year 2021-22. She highlighted that fund allocation as well as manpower is decreasing every year. She also informed the RAC that CIRCOT will be celebrating Centenary in 2024. She requested the RAC members to review the progress of research work and provide valuable comments and suggestions on the progress of research work and guidance for formulating future course of research projects and institute activities to be taken up in the future.

3. Release of Publication

On this occasion, the following two publications were released:

- 1. Frequently Asked Questions (FAQ) on Sulphur and its Nano formulation
- 2. Agri. Startup Ecosystem at ICAR-CIRCOT

4. Opening Remarks by Chairman and Members

Dr. M. K. Sharma, in his opening remarks mentioned about the cottonseed dryer being developed in collaboration with GTC of CIRCOT. He stated that initial trials are completed and after completion of commercial trials it will be released for the industry. He told that potential of high speed rotobar gin for long staple cotton can be explored. He also mentioned about the work on development of automatic roller grooving machine and a new fibre testing equipment. He emphasized upon the need to work on establishing the protocol for determination of ginning outturn (GOT) for ginning industries at the time of cotton purchase. The GOT figures vary as different types of lint cleaners are in use. He reiterated that necessary support to the institute in research and developmental activities will be continued in the future.

Prof (Dr.) S. R. Shukla, in his remarks mentioned about his long association with CIRCOT and specified that institute has utilised COVID period effectively as evidenced from good revenue generation and congratulated the scientists for keeping CIRCOT flag high. He mentioned that CIRCOT is dedicated to applied research for the wellbeing of the stakeholders/ farmers in every possible way. Research being an ongoing process may or may not get completed in a stipulated time frame. Hence if the work shows promise, it may be granted an official extension or may be continued without an official extension of finance, time period and facilities. Interdisciplinary research with scientists having different backgrounds of expertise will result in proper conduct and fruitful completion of a project. He emphasized on the enhancement in the number of publications though each project may not lead to a saleable product /patent or a reputed indexed publication. Publication in the form of booklet, monogram, review article, media coverage as per the relevance to the need of specific

stakeholder's community with easy access to the population interested in such knowledge should be thought of. Scientists/ researchers/ faculty from allied institutions may be involved at the planning stage of a project as well as in yearly review of the progress. MoUs signed with such institutions should be utilized with more vigour, not only for getting degrees to the employed scientists but also for proper and result oriented completion of the projects undertaken. Modality of such collaborations, if out of scope of the MoUs, can be worked out separately.

Dr. N. N. Mahapatra, in his opening remarks said that CIRCOT with its trained manpower can be the brand ambassador and contributor for the branding and promotion of *Kasturi* cotton. He suggested to work on bacterial cellulose and waterless dyeing/ supercritical CO₂ dyeing of cellulosic by selecting suitable nonpolar dyes as water will be scarce in future. He referred about the initiation of work in Japan on injecting the cotton plant with colour pigments to get coloured fibre. Work on blending of cotton with other natural fibres may also be taken up as cotton production may not keep pace with demand. He stressed on the necessity of participation in exhibitions like ITME to showcase technologies developed and activities undertaken at the institute.

Dr. N. G. Shah, in his opening remarks urged young scientists to take advantage of research laboratories and facilities at the institute which are of International standard and come out with research projects with innovative ideas and thoughts. He motivated and inspired scientists to utilise their potential to fullest extent and urged them to carry forward the legacy of the institute as it is going to celebrate its centenary in a couple of years. CIRCOT being an interface between farmers and industry should develop end to end solutions and communicate with the stakeholders to know their requirements.

Prof (Dr.) U. J. Patil, suggested that whole research work may be separated into basic, applied and commercial research. He urged the institute to take up research work on modelling, software development, application of IoT, blockchain and AI technologies in cotton post- harvest processing during the next five year period. Work on recycling used cotton materials for various purposes should also be taken up so that these do not end up in landfills. He advised the institute to improve linkages and collaborations with international organisations/Universities in textile sector as international exposure is very important. He further reiterated that institute has to play a major role initially in branding of *Kasturi* cotton. A clear focus on specific research objectives is required and publications are very important.

Dr. A. K. Thakur, appreciated the work done by the institute and mentioned that among five institutes under Agricultural Engineering Division; CIRCOT is doing best. However he mentioned the need for synergistic approach in future research programmes to fulfill the work plan/action points for the next five years promised in SFC. He emphasized on more and more efforts to raise revenue by sell of technologies/licensing and communication of successful technologies to stakeholders with convincing information on regular basis. He suggested to compile the

recommendations with action taken report of all three RAC meetings under this committee and submit it to next committee as reference material. He urged that research projects should fit somewhere in national programmes of Government. He opined that young scientist should be given free hand to think/innovate/explore and discuss about the new vistas of research in the area of cotton and they should be motivated, encouraged and supported. He told that at least one success story from the institute in a year or two should get published on ICAR website. He stressed upon the need for good publications in impact factor journals.

Dr. N. C. Patel Chairman, in his opening remarks; mentioned that this is the last meeting of the present RAC and complemented RAC members. He appreciated and congratulated Dr. Sujata Saxena, Director for her concise presentation on institute's achievements in terms of research output, revenue generation, skill development, incubation and commercial testing activities and also complemented all scientists for the excellent work. He appreciated the valuable and specific inputs given by the members and stressed upon the need for interaction and collaboration with Agricultural Universities and other institutes. He pointed out that as labour shortage is increasing, an efficient cotton picking machine is required and CIAE and CIRCOT can work together on it. Single row cotton picker will be useful for the country. To reduce the trash such as dry leaves etc. getting mixed up with the cotton during mechanical picking, effective defoliation is required and CIRCOT may work in this field. Development of a vacuum or any other type picking assistant may also be tried. He expressed concern over shortage of scientific and technical manpower and suggested the RAC to recommend and seek sufficient manpower from ICAR. He expressed need for fund management for priority areas as the budget is reducing. He suggested that short video clips/virtual tours of the divisions and the institute technologies can be made. He upheld the need for participation in exhibitions to showcase institute technologies.

5. Presentation of Action Taken Report (ATR) on Proceedings of 27th RAC

Dr. V. G. Arude, Member Secretary, RAC, presented the Action Taken Report (ATR) on the proceedings of 27th RAC which was held on 1st and 2nd June, 2021. The ATR was accepted by the RAC with comments and suggestion on following recommendations.

Project MP-88: Characterization of material used in development of sanitary pad may be carried out. Compare the performance of developed sanitary pads with commercially available pads.

RAC suggested to make a few sample pieces before going for large scale /pilot plant for making sanitary pads. PI may take help of industry in making these pieces.

BRNS sponsored project: Research may be undertaken to reduce gossypol by combined treatment of irradiation techniques followed by chemical method. During irradiation, gossypol may get degraded/ converted into different

compounds which may be carcinogenic and hence that also needs to be investigated.

While discussion, it was informed that the BRNS project was discontinued as the PI of the project got another sponsored project from DST with similar objectives. RAC opined that PI should have continued with BRNS project as it gives unique opportunity to work with gamma irradiation facility of BARC. RAC suggested if required PI may use the irradiation facilities available at AAU, Anand.

Project TT-9: Coating of fruits in demand and having handling issues and short shelf-life should be studied. Work out cost economics of coating, cost of coating should be compensated by increased shelf-life.

Commercial potential in the project may be explored.

Work on effluent management and pollution control in cotton processing industry may be taken up.

The second point mentioned in the ATR i.e. 'Dedicated projects on effluent management and pollution control could not be initiated due to lack of manpower' to be deleted as the work is being carried out under the ongoing project.

A good review of the technologies developed in the past should be undertaken to see if some of these can be suitably modified to meet the current requirements of stakeholders

RAC suggested to give importance to reviewing the technologies developed by the institute in the past and finish this work within three months' time.

6. Presentation of the Progress of Research Work for the year 2021-22

The progress of research activities carried out in the institute under different core areas of research during the period 2021-22 was presented by the respective Heads//Coordinator, as per details given below:

Core Area-I: Pre-ginning and Ginning: Dr. S. K. Shukla, Principal Scientist & Officer In-charge, Ginning Training Centre of ICAR-CIRCOT, Nagpur

Core Area- II: Mechanical Processing, Technical Textiles and Composites:

Dr. P. K. Mandhyan, Principal Scientist & Head (In-charge), Mechanical Processing Division (MPD)

Core Area –III: Characterization-Cotton and other Natural Fibres, Yarns and Textiles: Dr. A. S. M. Raja, Principal Scientist, & Head (In-charge), Quality Evaluation and Improvement Division (QEID)

Core Area –IV Chemical and Biochemical Processing & Biomass and Byproduct Utilization: Dr. Sujata Saxena, Principal Scientist & Head (In-charge), Chemical and Biochemical Processing Division (CBPD) and Acting Director

Core Area –V: Entrepreneurship and Human Resource Development: Dr. D. M. Kadam, Principal Scientist & Head (In-charge), Transfer of Technology Division (TTD) Consortia Research Project (CRP) on Natural Fibres: Dr. A.S.M. Raja, Principal Scientist, CBPD & Coordinator, CRP on Natural Fibres

Externally Funded projects: Presentation by respective project PI's:

- Dr. A. K Bharimalla, Senior Scientist
- Dr. C. Sundaramoorthy, Principal Scientist
- Dr. D. M. Kadam, Principal Scientist

7. Discussion on Progress of Research and Recommendations by RAC

A thorough discussion took place on the progress of research work carried out at the institute. The committee deliberated on the work being done and provided valuable inputs and directions for future course of research and institute developmental activities.

The recommendations are summarised as follows:

- 1. Commercial testing and evaluation report of cottonseed dryer to be prepared considering techno-economic aspects. Instead of using wood as fuel source, cotton stalks briquettes/pellets may also be used.
- 2. Natural fibre based packaging materials should be developed to replace PVC based packaging materials for packaging of food grains, sugar, fruits, vegetables and other agri produce
- 3. **Project II-04 Development of eco-friendly fruit protection bags for quality enhancement**: Eco-friendly fruit protection bags for fruits other than grapes and non-fruit items may also be tried
- 4. **Project II 05 Development of bionanocomposite films using extrusion process**: Attempt to make bio-composite films of 150 micron thickness by extrusion process
- 5. **Project CH.100 Development of Health Drink from cottonseed:** Provide justification for calling cottonseed milk as a health drink. Traditional Product (Paruthi Pal) made out of cottonseed need to be analysed scientifically and compared with other health drinks. Bring out a status paper on this aspect. Project can be dropped if there's no specific outcome
- 6. **Project II 06 Efficacy evaluation of ICAR-CIRCOT Nano-Sulphur as fertilizer formulation for different field crops**: Conduct comparative study on application of ICAR-CIRCOT nano-sulphur with application of NPK, conventional sulphur and control
- 7. Project CRP NINFET 07- Development of Building Materials using Natural fibres and other fibrous crop residues (CIRCOT Centre) CIRCOT Centre: Durability and storability study of natural fibre and its biomass based construction material (concrete blocks) to be carried out and its targeted use to be specified. Basis for selection of 0.5% natural fibre content in concrete block to be justified. Dr. Mandal from IIT, Mumbai may be consulted for guidance in the matter.
- 8. Project: An Inclusive Agribusiness Model for Sustainable Cotton Marketing in the State of Maharashtra (NASF): Reasons for variations in cost of cultivation based on marketing channel and FPO's offering more prices to cotton farmers need to be stated. Profitability and choice of marketing channel data need to be re-checked. Data of spinning consistency index to be re-checked for its

negative values. Relook at the presented data, draw inference properly and resubmit.

- Project CIRCOT-RAFTAAR ABI 1011105 Remunerative Approaches for Agriculture and allied Sectors Rejuvenation (RAFTAAR) Agri Business Incubation Centre (R-ABI): Only achievements during the reporting period should be reported and presented.
- 10. Project DST-40413210004 Design and Development of Pilot Plant for Extraction of Protein from Deoiled Cotton Cake and Value Addition (/By-Products Utilization) (DST/TDP): Proper protocol for extraction of toxic substances free protein from cottonseed should first be established and the pilot plant to be designed only after that.

8. Concluding Remarks

In the concluding remarks, Dr. N. C. Patel, Chairman, RAC appreciated RAC Members for their valuable inputs and attentive participation. He congratulated Director and scientists for carrying out excellent research work and impressive revenue generation during the past year despite difficult phase of COVID-19 pandemic. He complemented institute for celebrating 100 years of its service to the nation in a couple of years from now. He congratulated all presenters for nice presentations but urged to be very accurate and precise in collection and analysis of data before presentation.

He stressed upon the need for out of the box thinking and full utilization of time by scientists, scientific deliberations twice a month on specific topics and also interactions with eminent persons from outside to generate new ideas. He emphasized on undertaking interdisciplinary work and the need for inter-departmental, interinstitutional and international collaborations. He pointed out that for survey work, sample size should be as per NSS guidelines. He advised to focus research on gossypol removal, protein isolate, by-product utilization, development of mechanical delinting in place of chemical delinting to extract almost the entire amount of linters from cottonseed, mechanization of cotton harvesting in collaboration with CIAE and scaling down the cotton post- harvest processing machines to promote rural level industrialization. He suggested that issues regarding the patent filing can be decided by a committee at the institute level and issue of division wise/core area wise presentations in RAC can also be dealt with appropriately at the institute level and Director can look into the matter. He concluded with best complements to all the participants in the meeting.

9. Lecture on the occasion of RAC

On the occasion of 28th RAC, a lecture on the topic 'Relevance of Interdisciplinary Research in Textiles' was delivered by the honorable RAC member Prof. (Dr.) S. R. Shukla, Former Professor and dean, Institute of Chemical Technology (ICT), Mumbai. All RAC members, scientists and technical officers attended the lecture.

10. Vote of Thanks

The meeting ended with a formal vote of thanks by Dr. V. G. Arude, Senior Scientist and Member Secretary, RAC.

(Dr. N. C. Patel)

(Dr. V. G. Arude) Member Secretary, RAC

Annexure – 1 List of Participants in RAC Meeting

ICAR-CENTRAL INSTITUTE FOR RESEARECH ON COTTON TECHNOLOGY Adenwala Road, Matunga, Mumbai 400 019 TWENTY EIGHTH (28th) RESEARCH ADVISORY COMMITTEE MEETING Venue: Conference Room Date: 90 May 2022 Attendance Sheet Sr. No. Name Signature Dr. N. C. Patel 1. OPAtel 2. Prof. (Dr), S. R. Shukba Prof. (Dr). Narendra Shah 5. Prof. (Dr. U. J. Patil) 4. Dr. M. K. Sharma ONLINE Dr. N. N. Mahapatra 6. 7. Dr. A. K. Thakur Dr. Sujata Saxena 9, Dr. V. G. Arude 10. Dr. D. M. Kadam Examin alphan 11. Dr. A. S. M. Raja 12. Dr. P. K. Mandhyan 13 Suni Kuman 14 15. 16. 17. A. ARFUTHARAS Dr Ajinoth dlukace 2.0. 21. डा शेषराव लाइतकर

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ICAR-CENTRAL INSTITUTE FOR RESEARECH ON COTTON TECHNOLOGY

Adenwala Road, Matunga, Mumbai 400 019

TWENTY EIGHTH (28th) RESEARCH ADVISORY COMMITTEE MEETING

Venue: Conference Room Date: 10th May 2022

Attendance Sheet

Sr. No.	Nume	Signature
l.	Dr. N. C. Parel	Ofates-
2,	Prof. (Dr). S. R. Shukla	(32)15
3.	Prof. (Dr). Narendra Shah	Attended ONLINE
4.	Prof. Dr. U. J. Putil)	1 dalid
5.	Dr. M. K. Sharum	Attended DALING
6.	Dr. N. N. Mahapatra	Attended ONLINE
7.	Dr. A. K. Thakur	lular.
8.	Dr. Sujata Saxena	Execution.
9,	Dr. V. G. Arude	Otrudo
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31	Dr. S.V. Ghadge	ONLINE
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33	Dr. T. Senthikumar	ONLINE
34	Dr. Varsha Solankar	OKLINE
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Annexure-2

ICAR-CENTRAL INSTITUTE FOR RESEARECH ON COTTON TECHNOLOGY

Adenwala Road, Matunga, Mumbai 400 019

TWENTY EIGHTH (28th) RESEARCH ADVISORY COMMITTEE MEETING

9-10 May, 2022

PROGRAMME SCHEDULE

	<u>Day 1: 9th May 2022</u>					
Time	Agenda item					
10.00 am	Visit of RAC members to Various Research labs/Divisions					
11.00 am	• ICAR Song					
11.05 am	Welcome address and briefing of major achievements and activities of the institute					
	Dr. Sujata Saxena, Director					
11.15 am	Release of Publications					
11.20 am	Opening Remarks by RAC Members and Chairman					
11.45 am	• Action Taken Report on Proceeding of 27 th RAC meeting held on June 1- 2, 2021					
	Dr. V. G. Arude, Member Secretary, RAC					
	Presentation of Research Achievements					
12.15 pm	• Core Area- I: Pre-ginning and Ginning: Dr. S. K. Shukla, Principal Scientist & Officer In-charge,					
	Ginning Training Centre, Nagpur					
	• Core Area-II: Mechanical Processing, Technical Textiles and Composites: Dr. P. K. Mandhyan,					
	Principal Scientist & Head (I/c), Mechanical Processing Division (MPD).					
1.30 pm	Lunch break					
215 pm	• Core Area- III: Characterisation of Cotton and other Natural Fibres, Yarns and Textiles: Dr.					
	A. S. M. Raja, Principal Scientist & Head (I/c), Quality Evaluation and Improvement Division					
	(QEID)					
	• Core Area- IV: Chemical and Biochemical Processing Biomass & By-product Utilisation: Dr.					
	Sujata Saxena, Director (Acting) & Principal Scientist & Head (I/c), Chemical and Biochemical Processing Division (CBPD)					
	• Core Area- V: Entrepreneurship and Human Resource Development:					
	Dr. D. M. Kadam, Principal Scientist & Head (I/c), Technology Transfer Division (TTD)					
	Consortia Research Platform on Natural Fibre:					
	Dr. A. S. M. Raja, Principal Scientist & Co-ordinator, CRP on Natural Fibres					
	• Externally Funded projects: Presentation by Respective project PI's:					
	Dr. A. K Bharimalla, Senior Scientist,					
	Dr. C. Sundaramoorthy, Principal Scientist Dr. D. M. Kadam, Principal Scientist					
	Day 2: 10 th May 2022					
10.30 am	Discussion and remarks of RAC Members and Chairman on ICAR-CIRCOT's progress of work					
	and guidance on the future course of research work and institute activities to be taken up by the					
	institute					
11.30 am	Finalising Recommendations and Concluding Remarks by RAC Members & Chairman					
12.10 am	• Lecture on the occasion of RAC on the topic "Relevance of Interdisciplinary Research in					
	Textiles " by Prof (Dr). S. R. Shukla, Former Professor, Institute of Chemical Technology (ICT),					
	Mumbai					
12.55 pm	• Vote of Thanks: Dr. V. G. Arude, Member Secretary RAC.					
1.00 pm	• Lunch					

Annexure – 3

PHOTO-GALLERY

(28th RAC Meeting)



View of RAC Meeting (First day: 9th May 2022)



Presentation by Dr. Sujata Saxena, Director (First day: 9th May 2022)



Release of publication: 'FAQs on Sulphur and its Nano Formation'



Release of publication: 'Agri Startup Ecosystem at ICAR-CIRCOT'



View of RAC Meeting (Second day: 10th May 2022)



View of RAC Meeting (Second day: 10th May 2022)



Lecture by Prof (Dr.) S. R. Shukla (Second day: 10th May 2022)



Visit of RAC to Research Laboratories