Minutes of the 45th meeting of Research Advisory Committee held on 23rd December 2020 at CSRTI, Mysuru

The 45th meeting of Research Advisory Committee of CSRTI-Mysuru was held on 23rd December 2020 at CSRTI, Mysuru for reviewing the R&D programmes of the Institute and its nested units, carried out during the period August 2019 to November 2020. The newly constituted Research Advisory Committee was presided by Dr. Mahadev B. Chetti, Vice Chancellor, University of Agricultural Sciences (UAS) Dharwad (Karnataka) which reviewed the concluded research projects, new proposals and ongoing programmes. The list of members and participants attended the meeting is appended (**Annexure - I)**.

Dr. Pankaj Tewary, Director and Member-Convener of RAC welcomed the RAC Chairman. He extended warm welcome to experts, Dr. E. Sreenivasa Rao, Principal Scientist, IIHR, Bengaluru; Dr. K. Narayanagowda, UAS, GKVK, Bengaluru and Dr. H.K. Basavaraja, Scientist-E (Rtd), CSB. He also welcomed the Director (Tech/NSSO), CSB, Scientist -D and Head, RCS section, CSB, Bengaluru who attended in person. He also extended his hearty welcome to Dr.S. Janarthanan, Member and DOS Commissioners/Directors/ representatives, farmer and reeler members, who attended the meeting through webex. He also welcomed all the Scientists/RAs/SRFs/JRFs and research scholars of CSRTI-Mysuru and Scientist D and Heads of the nested units for the meeting.

Prof. Mahadev B. Chetti, Chairman of RAC in his opening remarks thanked CSB for choosing him as Chairman of RAC, CSRTI, Mysuru. He expressed his happiness for conducting the RAC meeting on the special 'National Farmers' Day / "Kisan Divas' on 23rd December, which is celebrated to commemorate the contributions of former Prime Minister Late. Chaudhary Charan Singh. Further, he also wished all the participants a Happy Farmer's Day. The Chairman appreciated the contributions made by the institute for the overall development of Sericulture.

Dr. Pankaj Tewary Director presented the highlights of the R & D achievements of the Institute during the period. Chairman appreciated the overall achievements of the institute, in particular on 'patenting and commercialization' and emphasized that the efforts should continue further. He also expressed his happiness for the development in the field of mechanization in sericulture which can address many of the field problems faced by the farmers. It will draw the attention of farmers to reduce the drudgery and cost of cultivation. Chairman suggested every scientist to publish at least one research article in NAAS rated

journal of > 6.0 every year to document the research findings. Dr. H.K. Basavarja, Member remarked that institute has developed many silkworm breeds and hybrids of specific nature and those hybrids should be taken to field and validated for future utilization.

1. CONFIRMATION OF THE MINUTES OF 44th MEETING OF RAC HELD ON 22nd JULY 2019

The RAC confirmed the minutes of the 44th meeting of RAC as no comments were received from any of the members.

2. & 3. REVIEW OF FOLLOW-UP ACTION TAKEN ON GENERAL/PROJECT SPECIFIC DECISIONS OF 44th RAC MEETING

Dr. N. Balachandran, Scientist-D PMCE presented the follow-up action on the suggestions / decisions made during the 44th meeting of RAC. The committee expressed satisfaction on the follow up action taken on the suggestions of previous RAC.

4. REVIEW OF CONCLUDED PROJECTS

1. **PIP-3592**: *Identification of indices for abiotic stress tolerance in mulberry with special reference to moisture and alkalinity stress.*

Decision: Dr. Gayathri T. presented the progress of the concluded project and the committee discussed the indices used for selection of varieties and opined that that the budget utilization is low.

(Action: Dr. Gayathri T., Sci-C, Mul. Physiology)

2. **PRP-3591**: *Identification of resistance in mulberry germplasm for root knot nematode disease*

Decision: Dr. Arunakumar G.S. appraised the progress achieved in the project. Committee appreciated the work done and suggested to utilize the identified resistant germplasm in RKN resistance breeding in mulberry and expressed that since the budget utilization is low, re appropriation in the details of expenditure may be done.

(Action: Dr. Arunakumar G.S., Sci-C, Molecular biology)

3. **PIE-3511**: *Development of Distinctiveness, Uniformity and Stability (DUS) Descriptors for Mulberry (Morus spp.) and their Validation* (Phase-II)

Decision: Mrs. M.R.Bhavya appraised the committee about the achievements made in the project. The committee observed the progress as satisfactory

(Action: Mrs. M.R. Bhavya, Sci-B, Molecular biology)

4. **AIB 01001 MI**: *Evaluation of Cauvery Gold (MV1 X S8)- An improved cross breed for cocoon productivity and silk quality*

Decision: Dr.K.B.Chandrashekar presented the progress of the concluded project. Committee discussed in detail about quality aspects of silk (Grading) and suggested that the hybrid may

be popularized in Southern India especially in Karnataka. However if it performed well in northeastern India it can also be popularized there through CSRTI, Berhampore for North eastern states.

(Action: Dr. K.B.Chandrashekar, Sci-D, MBL)

5. **AIB 3537**: *Improvement of silkworm breeding in India and Bulgaria*

Decision: Dr.S. Manthiramoorthy presented in detail the progress made in the project and the committee remarked that the performance of the new breeds developed utilizing Indian and Bulgarian pure breeds do not have much difference within and advised to take care in selecting parents for foundation cross. It was also advised to abbreviate the FCs in double hybrids in presentation.

(Action: Dr. S.Manthiramoorthy, Sci-D, BBL)

6. **AIB 01002 MI**: *Evaluation of S8 x CSR16, a new bivoltine silkworm hybrid under authorization trials among the farmers of South India*

Decision: Dr. R.Meenal appraised the committee about the progress made in the project. The committee discussed utility of single hybrid as compared to double hybrid in present context. Committee appreciated the performance of the single hybrid and suggested to submit report for hybrid authorization.

(Action: Dr. R.Meenal, Sci-D, BBL)

7. **AIT- 3593**: *Transcriptome analysis of silkworm for identification of molecular markers for improvement of silk quality.*

Decision: Dr. Kusuma L. made a detailed presentation on the progress of the concluded project. The committee appreciated the findings and suggested to use identified marker / regulator in future breeding programme.The committee also suggested to publish the findings in peer reviewed journals.

(Action: Dr. Kusuma L, Sci-C, BBL)

8. **AIB-3596**: *Development of multi-viral disease tolerant (NPV, IFV and DNV1) bivoltine silkworm breeds/hybrids of Bombyx mori L. through marker-assisted selection*

Decision: Dr. L. Satish presented the progress of concluded project and the committee advised to complete the OST to validate the performance of the identified hybrids within the scheduled time and suggested for OFT.

(Action: Dr. L. Satish, Sci-C, BBL)

9. **PRE 01005 CN**: *Demonstration and popularization of pheromone trap against silkworm uzifly Exorista bombycis*

Decision: Dr.S.Mahiba Helen appraised the progress made in the project. The committee suggested to inform NBAIR, Bengaluru to commercialize the trap on fast track mode through "agriinnovate India".

(Action: Dr. S. Mahiba Helen, Sci-D, PML)

After reviewing the concluded projects, the Chairman expressed the concern and it was also opined by the Director (Tech) that most of the projects have not utilized fully the allotted budgets. In this regard committee suggested the Director, CSRTI, Mysuru and the concerned PIs to re appropriate the budget in consultation with store/accounts section. It was also suggested to all the PIs that they should take due care for the utilization of budget in their respective projects in future. It may be reviewed by the concerned every year to avoid less spending in expenditure part.

(Action: All the concerned PIs)

5. NEW PROJECTS FOR APPROVAL

1. **PIC 01007 SI** : *Development of protocol for production of medically fit silk (cocoon, sericin, fibroin) for clinical purposes.*

Decision: Dr. Ravindra presented the project proposal. The committee suggested for revising the budget after re appropriating the head wise components.

(Action: Dr. Ravindra, Sci-C, SSC)

2. **PPA 01016 SI**: *Development of an agronomical package for tree mulberry cultivation for wide acceptance among the seri-farmers of Southern India*

Decision: Dr. Dhaneshwar Padhan presented the new project proposal. The committee advised the PI to modify the methodology by incorporating the farmer's practice into consideration with similar studies carried out in Sericulture college, Chintamani.

(Action: Dr. Dhaneshwar Padhan, Sci-B, Agronomy)

3. **PIE 01014 SI** : *Development of Distinctiveness, Uniformity and Stability (DUS) Descriptors for Mulberry (Morus spp) and their Validation - Phase III*

Decision: Mrs. M.R. Bhavya, presented the new project proposal. The committee approved and ratified the proposal for implementation as it is a continuous programme funded by PPV&FRA, New Delhi.

(Action: Mrs. M.R. Bhavya, Sci-B, Molecular biology)

4. **AIB 01011 SI** : *Development of multivoltine foundation crosses for productivity and high silk percentage*

Decision: Mrs. Soudaminy P.V. presented the new project proposal. The committee suggested to consult the breeders experienced in polyvoltine breeding to make use of the male moths to make it more economical and approved the project.

(Action: Mrs. Soudaminy P.V, Sci-D, MBL)

5. **AIB 01 009 MI**: *Evaluation of new bivoltine silkworm double hybrid TT21 X TT56 at farmers level for authorization and commercial exploitation*

Decision: Dr. S. Manthiramoorthy presented the new project proposal for ratification by the RAC. The committee approved and ratified the proposal for implementation.

(Action: Dr. S. Manthiramoorthy, Sci-D, BBL)

6. **PIC 01008 SI**: *Isolation, characterization of chitin/chitosan from silkworm pupal exuviae/ spent pupae and its commercial exploitation*.

Decision: Dr. K.N. Madhusudhan presented the new project proposal for ratification of the RAC. The committee approved and ratified the proposal.

(Action: Dr. K.N. Madhusudhan, Sci-D, BBL)

7. **BPS 01013 CN** : *Utilization and diversification of silkworm pupae products for human & animal consumption and composting.*

Decision: Dr. Y. Thirupathaiah presented the new project proposal for ratification by the RAC. The committee approved and ratified the multi institutional proposal for implementation with the suggestion to utilize the fund judiciously.

(Action: Dr. Y. Thirupathaiah, Sci-C, SW Physiology)

8. **AIT 01019 SI**: *Screening of drugs/Inhibitors to inhibit the PI3K-Akt pathway in Bombyx mori for controlling Nuclear Polyhedrosis Virus infection*

Decision: Dr. G. Mallikarjuna presented the new project proposal for ratification by the RAC. The committee approved and ratified the proposal for implementation without any modifications.

(Action: Dr. G. Mallikarjuna , Sci-C, SW Pathology)

9. **PRE 01010 MI** : *Development of Integrated Pest Management (IPM) module for leaf roller Diaphania pulverulentalis (Lepidoptera: Pyralidae) in mulberry*

Decision: Dr.S. Mahiba Helen presented the new project proposal for ratification of the RAC. The committee approved and ratified the proposal for implementation as proposed.

(Action: Dr. S. Mahiba Helen, Sci-D, PML)

10. **PPF 01017 SI** : *Economics of Mulberry Sericulture in South India*

Decision: Mrs. Joycy Rani Dasari presented the new project proposal for ratification of the RAC. The committee approved the proposal and informed that the budget is in higher side and need to be revised under travel component.

(Action: Mrs. Joycy Rani D, Sci-C, SEEM)

11. **PIN 01018 SI** : *Effect of Potassium Mobilising Bacteria Frateuria aurentia on growth and development of mulberry*

Decision: Dr. N.Dhahira Beevi presented the new project proposal for ratification of the RAC. The committee approved and ratified the proposal for implementation without any modifications.

(Action: Dr. N.Dhahira Beevi, Sci-D, RSRS, Salem)

12. **MFM 01020 CN:** *Development of Artificial Intelligence Empowered Multi-Sensor Approach for Gender Classification and Separation of Silkworm Cocoons*

Decision: Mr. S. M. Hukkeri presented the new project proposal for ratification of the RAC. The committee approved and ratified the proposal for implementation.

(Action: Mr. S. M. Hukkeri, Sci-D, SED)

6. REVIEW OF PROGRESS OF ON-GOING PROJECTS

There were 13 new projects including the multi institutional network project. These were presented by the concerned scientists during the session. Committed observed the progress and noted its outcome.

1. **PIC-3620**:*Engineering photosynthesis in mulberry for resilience to climate change: A C4 approach*

Decision: As Dr. Tanmoy Sarkar presented the progress to the committee and requested for extension of project period by six months. Expressing its apprehension on converting C3 mulberry to C4, the committee agreed for six months extension and advised the PI to send the request to CSB with justification details for extension.

(Action: Dr. Tanmoy Sarkar, Sci-C, MBG)

2. **PIB-3631**:*Primary yield evaluation for identification of superior mulberry hybrids with drought adaptive traits under sub-optimal irrigated condition*

Decision: Dr. Tanmoy Sarkar presented the progress the committee advised the Director to look into the delay in procuring the equipments proposed under the project.

(Action: Dr. Tanmoy Sarkar, Sci-C, MBG)

3. **PIB-3632**: *Evaluation of superior triploid genotypes for yield and adaptability under varied agro-climatic conditions*

Decision: Dr. S. Gandhi Doss, presented the progress and the committee suggested to include the overall budget of the project of all the centers in the progress/presentation.

(Action: Dr. S. Gandhi Doss, Sci-D, MBG)

4. **AICEM** : *Phase-IV: All India Coordinated Experimental Trial in Mulberry Phase-IV*
Decision: Dr. S. Gandhi Doss presented the progress. The committee noted the progress and advised to include the budget utilization details.

(Action: Dr. S. Gandhi Doss, Sci-D, MBG)

5. **PIB-3633** : *Development of highly productive and widely adapted mulberry using exotic and wild germplasm*

Decision: Dr. G.S. Arunakumar presented the progress of the project and the committee suggested to complete the project works as per milestones.

(Action: Dr. G. S. Arunakumar, Sci-C, Molecular Biology I Lab.)

6. **PRP 01015 SI** : *Identification, evaluation and inclusion of potential antagonistic microbes in Integrated Root Rot Disease Management in Mulberry*

Decision: Dr. G.S. Arunakumar presented the progress and informed that the project is just initiated and details on progress will be presented in future.

(Action: Dr. G. S. Arunakumar, Sci-C, Mulberry Pathology)

7. **PIC-3615**: *Mapping QTLs for alkalinity tolerance in Mulberry (Morus spp.)*

Decision: Mrs. M.R. Bhavya presented the progress of the project and the committee advised to complete the works as per milestones within the project period.

(Action: Mrs. Bhavya, M. R. Sci-B, Molecular Biology)

8. **PIN-3563**:*Evaluation of improved mulberry genotypes for yield potential, nutrient uptake and use efficiency under varied cultivation practices*

Decision: Dr. Dhaneshwar Padhan presented the progress of the project and the committee noted the progress.

(Action: Dr. Dhaneshwar Padhan., Sci-B, Agronomy)

9.1 **PIC 01003 CN -NW2a** : *Validation of a high density SNP genotyping array for QTL discovery by association mapping and bi-parental analysis in Mulberry*
9.2 **PIC 01 003 CN - NW2b**: *Discovery of QTL to drought adaptive traits by association mapping in mulberry*
9.3 **PIC 01003 CN -NW 2c** : *Identification of QTLs for yield associated traits in mulberry*
9.4 **PIC 01003 CN -NW2d** : *Identification of QTLs for nutrient use efficiency*
9.5 **PIC 01003 CN - NW2e**: *Sustaining Mulberry Yield: Identification of QTLs Conferring Resistance to Root Rot Disease by Linkage Mapping and Trait Introgression*
9.6 **PIC 01003 CN -NW3b** : *Development of new generation transgenic mulberry for drought stress tolerance and characterization of existing transgenic mulberry for confined field trials*
9.7 **PIC 01003 CN - NW4a**: *Comparative quantitative and qualitative analysis of secondary metabolites for identification of biomarkers responsible for feed quality in mulberry*

Decision: Dr. B.N. Gnanesh presented the progress of the multi institutional network project with all the sub components and informed the committee that due to COVID-19 pandemic many of the collaborating partners have requested extension of the project period by six months in the IV TEC meeting held on 29-09-20. Accordingly DBT has conveyed approval of extension of project period by six months (up to December 2021) through email and advised to submit the revised milestones for the period. He also expressed his concern for delay in procuring the equipments proposed under the project due to administrative reasons. The committee agreed for six months extension and advised the Director to sort out the delay in purchase of equipments.

(Action: Dr. B.N. Gnanesh Ramanujan Fellow, Molecular Biology I Lab.)

10. **AIB 01004 MI** : *Development of multivoltine breeds with improved silk quality utilizing indigenous and exotic bivoltine breeds*

Decision: Dr. K.B.Chandrashekar presented the progress of the project and the committee noted the progress.

(Action: Dr. K. B. Chandrashekar, Sci-D, MBL)

11. **AIT-3628**: *Assessment of SNP in silkworm (Bombyx mori L) by Genotyping by sequencing and genome-wide association mapping of important commercial traits*

Decision: Dr. S. Manthiramoorthy presented the progress and informed that as the SNP genotyping and validation works could not be completed as per schedule due to administrative delay in approving outsourcing of sequencing. It was requested to DBT (IV TEC meeting held on 29-09-20) for extension of the project period by three months. DBT has conveyed approval of extension of project period by three months (up to March 2021). The committee agreed for extension and advised to complete the project within the extended period.

(Action: Dr. S. Manthiramoorthy, Sci-D, BBL)

12. **AIP 01006 SI**: *Identification of probiotic consortium to improve the productivity in mulberry silkworm, Bombyx mori*

Decision: Dr. Y. Thirupathaiah presented the progress and the committee suggested completing the works as per milestones.

(Action: Dr. Y.Thirupathaiah, Sci-C, SW Physiology)

13. **ARP 01012 SI** : *Development of a knowledge base on the silkworm diseases and pests and their management*

Decision: Dr.G. Mallikarjuna presented the progress made in the project and the committee advised to complete the work elements within the approved project period

(Action: Dr. A.V. Mary Josepha Shery, Sci-D, SW Pathology)

7. Technology trial :

The progress of the ongoing OSTs/OFTs was presented by the individual scientists. The committee advised SEEM division to coordinate the OST/OFT trials and present the

consolidated report in next meeting including budget utilization details and performance of the technology evaluated at Institute level/ RSRS, REC level and farmer's level.

(Action: Sci-D, SEEM)

On Station Trial (OSTs)

Dr. R. Meenal presented the progress of OST on Evaluation of newly developed silkworm double hybrids. The committee noted the progress and advised to present the comparative data with control and also the expenditure incurred.

(Action: Dr. R. Meenal , Sci-D, BBL)

Dr. Satish L presented the progress of OST on newly developed multi-viral tolerant bivoltine hybrids (RDIN1 and RDIN2). The committee noted the progress and advised to present breed wise data with control and also the expenditure incurred.

(Action: Dr. Satish L, Sci-C, BBL)

Dr. Bhuvaneswari E presented the progress of OST on Validation of Chawki feed supplement formulation. It was advised to include the data on the performance of CFSF at private CRCs to support the results.

(Action: Dr. Bhuvaneswari, Sci-C, SW Physiology)

Dr. G. Mallikarjuna presented the progress of OST on Validation of M-LAMP technology. The committee advised to confirm the status of the samples which are positive (M-Lamp) by rearing them separately. Also meticulous planning is required to establish backward linkages with positive samples. Regarding the validation of the technology with Eri samples, it was suggested to collect moth samples from ESSPC, Hosur and complete the process. Similarly Tasar samples may get collected from nearby CSB units in Andhra Pradesh/Telengana. Further Director (Tech.) advised to take this technology for field use in next year on priority after completing the validation.

(Action: Dr. G. Mallikarjuna, Sci-C, SW Pathology)

On Farm Trial (OFTs):

Dr. K.B. Chandrashekar presented the progress of OFT on Evaluation of Improved PM - 4 line at Basic Seed Farm of Department of Sericulture, Karnataka and its cross breed at farmers level. The committee noted the progress and Director (Tech.) proposed that this PM-4 line identified should be put in the multiplication channel of DOSs.

(Action: Dr. K.B. Chandrashekar, Sci-D, BBL)

Dr. S. Manthiramoorthy presented the progress of OFT on Evaluation of new productive bivoltine hybrid at farmer's level. The committee noted the progress and advised to analyze the data with T-test and compare the performance.

(Action: Dr. S. Manthiramoorthy, Sci-D, BBL)

Dr. S. Manthiramoorthy presented the progress of OFT on Evaluation of NPV tolerant bivoltine hybrids at farmer's level. The committee suggested to ensure the involvement of RSRS staff available in the trial area instead of wholly depending on DOS for accurate results.

(Action: Dr.S.Manthiramoorthy, Sci-D, BBL)

The evaluation of G11 x G19 at farmer's level was not presented by the concerned scientist, as no trial were taken up yet and only the parental breeds were prepared and preserved. The trials will be taken up during the third quarter of 2021.

(Action: Dr. K.N. Madhusudhan, Sci-D, BBL)

8. Extension and other programmes:

Dr. N.G. Selvaraju, Sci-D and Head SEEM division presented the progress of ECPS and CPP progress and the committee noted the progress.

10. Capacity Building Training:

It was opined that that the CBT details and progress were already presented by Director during his presentation hence no separate presentation is required to save time.

Concluding remarks of RAC members

Dr. E. Sreenivasa Rao, Principal Scientist, IIHR, Bengaluru

He appreciated the efforts made by the Institute for the development of sericulture industry. He observed many projects presented during the session were on basic and applied aspects of sericulture but there is a need to undertake more projects on biotechnological aspects particularly marker assisted selection.

Dr. K. Narayanagowda, UAS, GKVK, Bengaluru

During the concluding remarks he expressed happiness over the ongoing programme of the Institute for the benefit of sericulture farmers in the country. He expressed extension discipline should have few projects and it will provide good information on the impact and percolation of technologies developed by the Institute. He also opined that if some invitees are called from the Sericulture College, Chintamani for the meeting, it could have been better for a fruitful interaction as they are also doing some works in the same discipline. He also suggested for the participation of CSRTI, Mysuru in Extension programmes like Krishimela, exhibition etc. organised by GKVK, Bengaluru for better exposure. There may be a MOU with UAS, Bengaluru and Sericulture College, Chintamani with the Institute for more collaborative work.

Prof. S. Janarthanan, Prof. and Head, University of Madras, Chennai

He has participated in the meeting through webex platform. He expressed his dissatisfaction as he could not attend the meeting in person due to the present COVID conditions. He felt that though quite a good number of biotechnological research are undertaken by the Institute, yet some more works on transcriptome aspects, new generation sequencing and MAS would be more appropriate.

Dr. H. K. Basavaraja, Scientist-E (Rtd.), CSB, Bengaluru

He appreciated the Director and his team for the remarkable efforts make in sericultural research in particular on silkworm breeding. He emphasised the need for the marker assisted selection in mulberry as well as silkworm improvement. He advised to select proper parents and use the highly segregating population for breeding resources. He also emphasised on need for discussion of testing of silk for International grading for proper interpretation in future.

Dr. R.K. Mishra, Director (Tech) & Director, NSSO, CSB, Bengaluru

Budget utilization in many of the CSB funded projects are very low and the projects are concluded with poor utility. This has to be improved to get better fund allocation for the coming years for the Institute as a whole. Hence, the concerned PIs should take due care in the utilization of budget.

Dr. Mahadev B.Chetti, Vice Chancellor, UAS, Dharwad (Chairman)

Overall performance of the Institute is commendable. The Institute has very good number of patents in its credit and few are in queue, the same efforts should continue, he expressed. However, more number of research publications in NAAS rated journals are also to be targeted in future. Documentation and publicity are of key factors in research, quality photographs of high resolution on technologies should be made available for exhibiting in various forums as a part of popularization. Though efforts are made on organic mulberry cultivation and silk production, projects on zero budget natural farming are also to be proposed. Every scientist should engage in research, involve in teaching as training is also mandate of the institute. In view of climate change situation, research may be planned on climate resilient sericulture in mulberry and silkworm accordingly. The Institute may plan for diamond jubilee event next year in which all the technologies developed by the Institute may be documented. More awareness programmes may be conducted in areas like Gulbarga, Raichur, Bidar and Bellary areas. Policy makers may consider extending cocoon marketing

facilities in North Karnataka to support the farmers from the area. RAC meeting should be conducted once in every six months.

General points

- Project on grafting in mulberry to be made for poor rooters or varieties prone to root rot, root knot etc. and data on grafting may be generated.
- The Institute has made very good number of patents, many patent applications are filed and pending for allotment which is very good. However more number of research publications may also be made in NAAS rating Journals.
- Administration to support the timely purchase of equipments proposed under the projects.
- Budget utilization in general has to be improved in the projects to get better budget allocation for the coming years for the Institute as a whole.
- Though good number of patents and commercialization are achieved already, efforts should continue to get many more patents.
- Commercialization of Technologies should be done through "Agriinnovate India" of ICAR for speedy processing.
- Documentation and publicity are very important, quality photographs of high resolution on technologies should be made available for exhibiting in different forums and to popularize the technologies developed by the Institute. Directory of personnel worked in the Institute to be maintained.

The meeting ended with vote of thanks to the Chairman and members and DOS representatives, Scientists of the Institute and nested units.

CHAIRMAN
(Dr. Mahadev B. Chetti)
Vice Chancellor,
University of Agricultural Sciences
Dharwad

Annexure-I

List of members attended 45th Meeting of RAC held on 23rd December 2020

#	Name of the Member	
1	Dr. Mahadev B.Chetti, ViceChancellor, UAS, Dharwad	Chairman
2	Dr. Pankaj Tewary, Director, CSRTI-Mysuru	Member Convener
3	Dr. H. K. Basavaraja, Director (I/C) (Rtd.), CSB, Bengaluru	Members
4	Dr. E. Sreenivasa Rao, Principal Scientist, IIHR, Bengaluru	
5	Prof. S. Janarthanan, University of Madras, Chennai (through Webex)	
6	Dr. K. Narayanagowda, UAS, GKVK, Bengaluru	
7	Dr. R.K. Mishra, Director (Tech.) and Director, NSSO, CSB, Bengaluru	
8	Dr. K. Sathayanarayana, Sci-D and Head, RCS, CSB, Bengaluru	
9	Mr. N. Ramamoorthy, DD (Seed, Hosur) (Rep. DOS, TN) (through Webex)	
10	Smt. Arun Kumari, Addl.Director, (Rep. DOS, AP) (through Webex)	
11	Mr. L.V. Rama Reddy, Director, Hort. &.Sericulture DOS, Telengana, (through Webex)	
Members who sought leave of absence		
12	The Commissioner of Sericulture DOS, Karnataka	
13	The Commissioner of Sericulture, Govt. of Madhya Pradesh, Bhopal	
14	The Director DOS , Maharashtra, Nagpur	
15	Mr. Shaik lsmail, Reeler, Chikkaballapur, Karnataka	
16	Mr. Y. Shankar Reddy, Farmer, Palamaner, AP	

List of Participant Scientists CSRTI, Mysuru and its nested units for 45th RAC

Name	Designation	Section/Unit
Main institute		
Shri. N. G. Selvaraju	Scientist-D	CSRTI, Mysuru
Dr. S. Purushotham	Scientist-D	CSRTI, Mysuru
Dr . K. B. Chandrashekar	Scientist-D	CSRTI, Mysuru
Dr. S. Gandhi Doss.	Scientist-D	CSRTI, Mysuru
Dr. C.M. Babu	Scientist-D	CSRTI, Mysuru
Dr. Santha, P. C.	Scientist-D	CSRTI, Mysuru
Dr. M. Muthulakshmi	Scientist-D	CSRTI, Mysuru
Dr. R. Meenal	Scientist-D	CSRTI, Mysuru
Mrs. Anuradha H. Jingade	Scientist-D	CSRTI, Mysuru
Mrs. P.V. Soudaminy	Scientist-D	CSRTI, Mysuru
Dr. Mahibha Helen	Scientist-D	CSRTI, Mysuru
Dr. Manthiramoorthy, S.	Scientist-D	CSRTI, Mysuru
Shri. Shivakumar Hukkeri	Scientist-D	CSRTI, Mysuru
Dr. K.N. Madhu sudhan	Scientist-D	CSRTI, Mysuru
Dr. Ravindra Mattigatti	Scientist-D	CSRTI, Mysuru
Dr. N. Balachandran	Scientist-D	CSRTI, Mysuru
Shri M.N. Chandrashekar	Scientist-D	CSRTI, Mysuru
Dr. Vineet Kumar	Scientist-D	CSRTI, Mysuru
Dr. Mary Josepha, A.V. (through Webex)	Scientist-D	CSRTI, Mysuru
Dr. Tanmoy Sarkar.	Scientist-C	CSRTI, Mysuru
Dr.Thirupathaiah, Y.	Scientist-C	CSRTI, Mysuru
Shri Y.N.Sanath kumar	Scientist-C	CSRTI, Mysuru
Dr. Gayathri, T.	Scientist-C	CSRTI, Mysuru
Dr. Bhuvaneshwari, E.	Scientist-C	CSRTI, Mysuru
Mrs .Joycy Rani D	Scientist-C	CSRTI, Mysuru
Dr. Kusuma L	Scientist-C	CSRTI, Mysuru
Dr. V.Sobhana	Scientist-C	CSRTI, Mysuru
Dr. Ranjini M.S.	Scientist-C	CSRTI, Mysuru
Dr. Ravindra, A	Scientist-C	CSRTI, Mysuru
Dr. Arunakumar G. S.	Scientist-C	CSRTI, Mysuru
Dr. Mallikarjuna, G.	Scientist-C	CSRTI, Mysuru
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Dr. Dhaneshwar Pradhan	Scientist-B	CSRTI, Mysuru
Dr. Gnanesh, B. N.	Raman. Fell.	CSRTI, Mysuru
Dr. Amit Saha	Scientist-B	CSRTI, Mysuru
Dr. Divya Singh	Scientist-B	CSRTI, Mysuru
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Dr. G. S. Geetha	SRA(SS)	CSRTI, Mysuru
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Shri Munikrishnappa, H. M.	AD(SM)	CSRTI, Mysuru
RSRSs/RECs (through webex)		
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Dr. Nishitha Naik	Scientist-D	BSF, Hassan
Shri. S.B. Kulkarni	Scientist-D	RSRS, Kodathi
Shri. B. Vijaya Naidu	Scientist-D	RSRS, Anantapur
Dr. K. Praveen Kumar	Scientist-D	RSRS Mulugu
Shri .T.Sivasubramoniam	Scientist-D	RSRS, Ch.nagar
Dr. Venkatachalapathy	Scientist-D	REC, Palamaner
JRF/SRF/RA(In person)		
Lalitha kumari F	RA	CSRTI, Mysuru
P. Sowbhagya	SRF	CSRTI, Mysuru
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Jagadamba M.Y	Proj.Asst.	CSRTI, Mysuru
Harihitha C	Proj.Asst	CSRTI, Mysuru
Supriya M	JRF	CSRTI, Mysuru
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Harish kumar J	JRF	CSRTI, Mysuru
Pushpa Hamsi	Proj.Asst.	CSRTI, Mysuru
Shwetha Sharma	JRF	CSRTI, Mysuru