TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

29th SCIENTISTS' MEET ON FORESTRY AND 10th SCIENTISTS MEET ON SERICULTURE

(May 2, 2019)

Lead Center

Forest College and Research Institute
Meetupalayam – 641 301

Directorate of Research
Tamil Nadu Agricultural University
Coimbatore 641 003

2019

PROCEEDINGS
29th SCIENTISTS MEET ON FORESTRY AND
10th SCIENTISTS MEET ON SERICULTURE
(May 2, 2019)

Pre review of Forestry and Sericulture projects was conducted at Seminar Hall I and Seminar Hall of Centre for Plant Protection Studies, respectively at TNAU, Coimbatore on the forenoon of 02.05.2019. Dean (Forestry) and Director of Research reviewed the progress of work of externally funded schemes, core projects and university research projects of Forestry. The Director (Centre for Plant Protection Studies) reviewed the progress of work of externally funded schemes, core projects and university research projects of Sericulture.

The 29th Scientists' Meet on Forestry and 10th Scientists' Meet on Sericulture was held on the afternoon of 02.05.2019 at the Seminar Hall – I, TNAU, Coimbatore, with a view to review the ongoing research projects in Forestry and Sericulture. Scientists involved in Forestry and Sericulture research from FC&RI, Mettupalayam, AC&RI, Madurai, AC&RI, Killikulam, ADAC&RI, Trichy, AC&RI, Kudimiyanmalai, AC&RI, Vazhavachanur, HC&RI, Periyakulam, DARS, Chettinad, Controllorate of Examinations, TNAU, Coimbatore, University Officers, Professor and Head of various departments attended the meeting. The meeting was chaired by Dr.N.Kumar, Vice Chancellor, TNAU, Coimbatore.

Dr.K.S.Subramanian, Director of Research, TNAU, Coimbatore, welcomed the gathering and presented the highlights of Forestry and Sericulture research. He emphasized the importance of Integrated Farming System, GIS and sensor based monitoring of Forest wealth and Wild life management. Further, the Director of Research insisted the need for development of value added products in Forestry and Sericulture and he threw light on the development of bio- herbicide from tamarind leaves and water use efficiency of *Prosopis juliflora.*

Dr. K. K. Suresh, Dean, FC&RI, Mettupalayam, presented the action taken report on the recommendations of 28th Scientists' Meet on Forestry and 9th Scientists' Meet on Sericulture. Research highlights of the concerned department were presented by the Professor and Head of Agroforestry, Forest Products and Wildlife, Forest Biology and Tree Breeding, Silviculture & NRM and Sericulture.

The Proceedings of 29th Scientists' Meet on Forestry and 10th Scientists' Meet on Sericulture 2019 are furnished under the following headings:

I. Department of Agroforestry

A. Decisions made on OFT
B. Research projects on Agroforestry
C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2020

II. Department of Forest Products & Wildlife

A. Decisions made on OFT
B. Research projects on Forest Products and Wildlife
C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2020

III. Department of Forest Biology and Tree breeding

A. Decisions made on OFT/MLT
B. Research projects on Forest Biology and Tree breeding
C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2020

IV. Department of Silviculture & Natural Resource Management

A. Decisions made on OFT
B. Research projects on Silviculture & Natural Resource Management
C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2020

V. Department of Sericulture

A. Decisions made on OFT
B. Research projects on Sericulture
C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2020

VI. CLOSING REMARKS & WAYFORWARD

VII. CONTACT DETAILS OF SCIENTISTS PARTICIPATED IN THE CSM

I. DEPARTMENT OF AGROFORESTRY

A. Decisions made on OFT

FOR ADOPTION

- Kadam MTP 1 variety for adoption
- Kapak Arachalur (MTPCP 18) will be proposed for variety release
- FCRI LL 15 – Subabul will be proposed for variety release
- CW 10 – identified for face veneering in plywood production
- Clonal technology for Kadam and African Mahogany

FOR OFT

1. *Toona ciliata* - TCO 2

Centres: one/two farmers field

Treatment details : Single clone with amplfied clonal test

Observations to be recorded : Plant height, basal diameter, GBH, Clean bole height, No. of branches.

2. Multifunctional Agroforestry model

Centres: KVK, Vamban, TNAU, Coimbatore and one/two farmers field

Treatment details: Location specific model will be developed

Obserbations to be recorded: Growth and yield parameters

B. Research projects on Agroforestry

Department	Centre	URP	University Core Project	AICRP	External Funded Project	Total
Agroforestry	FC&RI, Mettupalayam	1	2	3	3	9

C. REMARKS ON THE ONGOING UNIVERSITY RESEARCH SUBPROJECTS/AICRP/EXTERNALLY FUNDED PROJECTS

Sl. No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				

1	DCM/MTP/AGR/2016/001 Screening and evaluation of shade tolerant fodder crops in *Melia dubia* based silvipastoral system	Dr.K. Ramah Asst. Prof. (Agronomy)	November 2016 to October 2019	Project may be continued
2.	FCRI/CTN/FOR/2014/002 Development of suitable *Gliricidia* based alley cropping models for rainfed alfisol for sustainable soil health and crop production.	Dr. K.R. Ramesh Asst. Prof. (Forestry)	August 2014 to June 2019	Project may be closed and completion report shall be submitted on or before July 2019
University Core Project				
1	FCRI/MTP/FOR/2018/CP 041 Design and development of multifunctional agroforestry models for drylands	Dr.R. Jude Sudhagar, Assoc. Prof. (Forestry)	June 2018 to May 2021	Project may be continued
2	CARDS/MTP /AEX 2018/CP 167 Identification and documentation of ITKs among the tribes of The Nilgiris.	Dr.C. Cinthia Fernandaz, Assist. Prof. (Ag. Extn.)	February 2019 to November 2020	Project may be continued
External Funded Project / AICRP				
1	APB/FCRI/MTP/DTB/2014/R003 Inventory, Evaluation and Promotion of Plywood Genetic Resources in Tamil Nadu	Dr. K.T. Parthiban Prof. & Head (AF)	5 years	Project may be closed. However the trials may be continued through CIAF activities
2	CPL/FCRI/MTP/AGF/2017/R005 Improvement, Characterization and Utilization of tree species amenable for Composite Wood Technology (CWT)	Dr. K.T. Parthiban Prof. & Head (AF)	5 years (01.04.2017 to 31.03.2022)	Project may be continued
3	CIAF/FCRI/MTP/AGF/2016/R004 Consortium of Industrial Agroforestry(CIAF)	Dr. K.T.Parthiban Prof. & Head (AF)	01.04.2016 onwards	Project may be continued
4	AICRP/FOR/MTP/FOR/001 Assemblage of germplasm in *Ceiba pentandra*	Dr.P.Rajendran Assoc. Prof. (Forestry)	2007 onwards	Project may be continued

	AICRP/FOR/MTP/FOR/001 Performance evaluation of Silvipasture and hortipasture based Integrated Farming System	Dr K. Ramah Asst. Prof. (Agronomy)	November 2015 to October 2020	Project may be closed and new project may be proposed
	AICRP/FOR/MTP/FOR/001 Tribal Sub Plan (TSP) under AICRP on Agroforestry	Dr.P.Rajendran Assoc. Prof. (Forestry) Dr K. Ramah Asst. Prof. (Agronomy)	2016 onwards	Project may be continued

D. GENERAL REMARKS:

- Identification and collection of Kapok genotypes in Megamalai of Theni.
- Collection of Ainipala genotypes from HRS, Pechiparai.
- Scope of recommendations and inputs on policies of Agroforestry in Plantation sectors need to be explored.
- A hand book on all G.Os related to timber / exempted timber/ timber transit may be prepared for the benefit of farmers.
- Horsegram as an intercrop shall be included in the agroforestry experiment.
- Multifunctional circular agroforestry model shall be established at RRS, Aruppukottai; ARS, Kovilpatti, AC&RI, Killikulam and DARS, Chettinad.
- Impact study on the adoption of FC&RI released varieties in the farmers field shall be conducted.

E. ACTION PLAN (2019 - 2020)

Theme 1: Development of HYSR clones amenable for multifunctional Agroforestry systems

Theme leader	Dr.K.T.Parthiban, Prof. and Head		
Theme Activity	**Name of the Scientist(s) and Centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Inventory of new species based on wood quality Development of HYSR clones Development of Mass multiplication Technology	Dr.P.Rajendran, Centre: FC&RI	New genotypes / clones will be identified and evaluated Mini clonal technology will be standardized for various agroforestry trees	HYSR clones will be identified Protocol for mass multiplication will be delivered

Theme 2: Design and development of agroforestry models

Theme leader	Dr.K.T.Parthiban, Prof. and Head		
Theme Activity	**Name of the Scientist(s) and Centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Development of Multifunctional Agroforestry model (Provisional, Regulation, Cultural and Supporting Functions)	Dr.R.Jude Sudhagar, Dr.M.Murugesh, Dr.K.Ramah, Dr.P.Kumar Dr B. Sivakumar Centre: FC&RI	Development of Multifunctional Agroforestry models will be continued	Profitable multifunctional agroforestry model will be identified

Theme 3: Tree fodder studies and development of concentrate feed

Theme leader	Dr.K.T.Parthiban, Prof. and Head		
Theme Activity	**Name of the Scientist(s) and Centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Assemblage of potential Fodder trees Quality characterization Development of Tree fodder supplemented feed Concentrate	Dr.P.Rajendran Dr K. Ramah Dr.K.R.Ramesh Centre: FC&RI	Quality characterization will be assessed Development of feed concentrate	Potential fodder trees will be identified for adoption

Theme 4: Design and development of climate resilient agroforestry models

Theme leader	Dr.K.T.Parthiban, Prof. and Head		
Theme Activity	**Name of the Scientist(s) and Centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Development of Tree crop model for mitigation and adaptation to climate change	Dr.P.Rajendran Dr.K.Ramah Dr. M. Prabhu Centre: FC&RI	Observations on growth and climatic parameters will be continued	Productive model for changing climate will be identified

Theme 5: Impact studies (Productivity, Profitability, Socio-economic and Environmental impacts)

Theme leader	Dr.K.T.Parthiban, Prof. and Head		
Theme Activity	**Name of the Scientist(s) and Centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Establishment of linkages Assessment of socio- economic impact	Dr.C.Cinthia Fernandaz, Dr.K. Divya Centre: FC&RI	Enrolment of Consortium members will be continued Maintenance of data base will be continued Assessment for socio economic analyses will be continued	Establishment of linkages for promotion of consortia based agroforestry

II. DEPARTMENT OF FOREST PRODUCTS AND WILDLIFE

A. DECISIONS MADE ON OFT

FOR ADOPTION

***Ailanthus excelsa* as medium density plywood as core veneer**

- *Ailanthus excelsa* has maximum veneer recovery (60.95%), minimum veneer shrinkage (4.57%) and medium density of 711 Kg m^{-3}. In addition , it has the modulus of elasticity of 5024 N mm^{-2}, the modulus of rupture of 34.68 N mm^{-2} and glue shear strength of 1318 N mm^{-2} .As *Ailanthus excelsa* wood has shown nearer physical and mechanical properties to the IS 1708 standard, it could be used as medium density plywood as core veneer.

FOR INFORMATION

- The splint recovery in Kapok (*Ceiba pentandra*) in terms of number of splints is 16140 per kg of wood which is within the acceptable range. However the maximum density was 340.50 kg m^{-3} which is below the IS standard. The low density influences the fissility and breakage of the splints. Hence, Kapok could be used for manufacturing low grade match splint.

- The status of tiger corridor between Mudhumalai tiger reserve and Mukurthi National Park in Tamil Nadu lime lights that the grid numbering 3 to 36 is a potential tiger movement pathway. By monitoring grid pathways regularly and preventing human intervention, the tiger population could be protected in Nilgiri Biosphere Reserve.

- The habitat condition of Thengumaragada & Thalamalai area are highly suitable for Herbivores and Carnivores Population

- Among the ten tree species studied , *Swietenia macrophylla* showed higher level of resistance to termite, *Coptotermes formosanus* with the lowest percent of wood loss (1.8 %), survival rate (14.7 %) and wood consumption (0.4 mg/individual) after an exposure period of 21 days.

- Teak wood is highly susceptible to wood decay fungi belongs to the family Ganodermataceae, Polyporaceae and Xylariaceae. The moisture content of wood should be monitored regularly to protect the wood quality. Hence, Preservation and Management of wood decay fungi needs to be addressed to prevent loss in quality of wood.

- Based on the studies conducted on extraction of seed gum from *Cassia fistula* seed powder, it was found that the seed gum is soluble in hot and cold water. pH of *Cassia fistula* seed gum is 6.94, viscosity is 108 cP (1%) and swelling index is 2.21 which shows the suitability as thickening agent. The rheological properties (Flow properties) of seed gum showing the viscoelastic behaviour which indicate the suitability for use as hydrocolloid for probable use in the food industry.

- ECM fungi viz., *Laccaria and Lycoperdon* associated with the trees of *Casuarina and Cassia* were isolated using modified Melin-Norkans (MMN) medium. Application of

ECM Fungi @ 50 ml / bag has been found to improve the growth of *Casuarina* seedlings in nursery.

B. RESEARCH PROJECTS ON FOREST PRODUCTS AND WILDLIFE

Department	Centre	URP	University Core Project	External Funded Project	Total
Forest Products and Wildlife	FC&RI Mettupalayam	6	2	1	9

C. REMARKS ON THE ONGOING UNIVERSITY RESEARCH PROJECTS/AICRP/EXTERNALLY FUNDED PROJECTS

Sl. No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
1	FCRI/PKM/FOR/2016/ 001 Studies on the wood characterization of *Ceiba pentandra (*Kapok) for pulp wood, plywood and match wood production	Dr.I.Sekar Professor (Forestry)	Jan.2017 to Nov.2019	Project may be continued
2.	FCRI/MTP/FOR/2015/001 Baseline Survey on Biodiversity and Non wood Forest Products of Chitheri Hills of Eastern Ghats	Dr.K.Baranidharan Asst.Prof.(Forestry)	July 2015 to June 2018	Project may be closed and the completion report shall be submitted on or before July 2019
3.	No.AECRI/MTP/FAP/2016 /001 Optimization of process parameters and pretreatments for extraction of *Cassia fistula* seed gum for use as hydrocolloid	Dr.P.Sudha, Asst.Professor (F&APE)	Oct.2016 to Sep.2018	Project may be closed and the completion report shall be submitted on or before July 2019
4.	CPPS/MTP/ENT/2017/001 Investigation of the termite species infesting live trees	Dr.M.Suganthy, Assoc.Professor (Agrl.Ento.)	April 2017 to March 2020	Project may be continued
5.	NRM/MTP/AGM/2015/001 Studies on the diversity of Ectomycorrhizal fungal flora in the Mettupalayam range of Coimbatore Forest Division	Dr.M.Tilak Asst.Prof.(Agrl.Micro.)	Dec.2015 to June 2018	Project may be closed and the completion report shall be submitted on or before July 2019

6.	CPPS/MTP/PAT/2017/001 Documentation, loss Assessment due to Wood Decay Fungi and their management	Dr.A.Sudha Asst.Prof.(Pl.Patho.)	Jan 2017 to Dec 2019	As the project leader was transferred, completion report was submitted for closing the project
University Core Project				
1	FCRI/MTP/FOR /2018/ CP100 Studies on suitability of *Ailanthus excelsa* and *Sterculia foetida* for plywood production	Dr.M.P.Divya Prof.&Head	Nov 2018 to Mar 2020	Project may be continued
2	FC&RI/MTP/FOR/2018/ CP040 Value added products of gum from trees grown in farm lands under different agroclimatic zones of Tamil Nadu	Dr.R.Ravi,AP (For.) Dr.K.Baranidharan, AP(For.) Dr.P.Sudha, AP(F&APE)	Sep.2018 to March 2021	Project may be continued
External Funded Project				
1	FC&RI/MTP/TNFD/F36 scheme NG Monitoring biodiversity and impact in critical habitats after removal and maintenance of invasive alien species and efficacy of maintenance works in Sathyamangalam Tiger Reserve	Dr.K.Baranidharan Asst.Prof.(Forestry)	April 2016 to March 2021	Project may be continued

D. GENETAL REMARKS

- Consortium of wood decay fungi may be developed for quick decomposition of organic waste.
- Analysis of mid gut microflora of termites shall be done.
- The microflora present in the elephant dung shall be assessed.
- Research towards resolving man animal conflicts near forest areas shall be focused.
- Research on value added forest products need to be strengthened.
- A study on removal of invasive species and introduction of native tree species for wildlife protection may be done.

E. ACTION PLAN (2019 - 2020)

Theme 1: Studies on the wood characterization in farm grown trees

Theme Leader	Dr. M. P. Divya, Professor & Head			
S. No.	**Theme Activity**	**Name of the Scientists and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
1	Studies on the suitability of *Ceiba pentandra* and *Sterculia foetida* for various industrial utility	Dr. M. P. Divya Dr. I.Sekar Centre: FC&RI	Testing the pulpwood suitability of kapok for pulp and paper production Assessing the plywood properties of *Sterculia foetida*	Suitability of pulpwood and plywood will be identified

Theme 2: Value addition of Non wood forest products

Theme Leader	Dr.I.Sekar, Professor (Forestry)			
S. No.	**Theme Activity**	**Name of the Scientists and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
1	Value addition of tree gum	Dr.R.Ravi Dr.P.Sudha Centre: FC&RI	Analysing the gum properties in *Vachellia nilotica* and *Ceiba pentandra* and Standardizing protocol for extraction of gum Extraction of seed gum from *Prospis juliflora* and *Delonix regia*	Development of gum powder as additive for industrial utility
2	Value addition of Bee products	Dr. M. Senthil Kumar Dr.I.Sekar Dr.M.P.Divya Centre: FC&RI	Extraction of Propolis, Bee wax and royal jelly from Indian bee colonies	Alternative bee products from Indian bees

Theme 3: Wood deterioration studies and their management

Theme Leader	Dr.M.Senthil Kumar, Asst. Professor (Agrl. Entomology)			
S. No.	**Theme Activity**	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
1	Bioecology , taxonomy and management of wood boring beetles in timber yard	Dr.M.Senthil Kumar M.Suganthy Centre: FC&RI	Biology and morphological characterization of wood boring beetles	Development of IPM modules for the management of wood boring beetle
2	Analysis of midgut microflora of termites	Dr.M. Senthil Kumar Centre: FC&RI	Collection of termites from different tree species, bioassay, isolation and characterization of gut microbes	The endosymbionts responsible for the digestion of food material in host selection will be identified

Theme 4: Wildlife Habitat Analysis

Theme Leader	Dr. K. Baranidharan, Assistant Professor (Forestry)			
S. No.	**Theme Activity**	**Name of the Scientists and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
1	Corridor assessment of Sathiyamangalam Tiger Reserve	Dr. K. Baranidharan Dr.R.Ravi Centre: FC&RI	Tiger corridor assessment in Thalavadi and Hasanur	Identification of New Corridor in Sathyamangalam Tiger Reserve
2	Habitat Analysis and Evaluation	Dr. K. Baranidharan Centre: FC&RI	Habitat analysis of Black buck in Sathiyamangalam Tiger Reserve	Identification of welfare factors of Black buck

III. DEPARTMENT OF FOREST BIOLOGY AND TREE IMPROVEMENT

A. DECISION MADE ON OFT

FOR ADOPTION

- Clonal Propagation techniques for mass multiplication of *Azadirachta indica*
- Clonal Propagation techniques for mass multiplication of *Bixa orellana*

FOR OFT

1. Annatto (*Bixa orellana)* - TNBi1 and KL Bi3

S.No	Genotype	Parentage	Yield/Plant (g)	Duration	Yield Increase Over		Special feautres
					Population Mean (g/pl	Genotype (Yield/Plant (g)	
1	TNBi1	Selection	678.15	Perennial	438.93	678.15	High yielding genotype adoptable for wider edapho climatic conditions
2	KABi3	Selection	612.85	Perennial	438.93	612.85	

Centres:

FC&RI, Mettupalayam, AC&RI, Killikulam and HC&RI, Periyakulam

Treatment details

S.No	Genotypes	FC&RI, Mettupalayam (No.of plant/genotypes	AC&RI, Killikulam (No.of plant/genotypes	HC&RI, Periyakulam (No.of plant/genotypes)
1	TNBi 1	2000	1000	1000
2	KLBi 3	2000	1000	1000

Obserbations to be recorded:

a) Plant Height (m)

b) Basal diameter (cm)

c) No. of branches

d) Fruit weight (Kg)

e) Individual plant yield (g)

FOR INFORMATION

- Dye Extraction Protocol for *Eucalyptus tereticornis (bark), Anogeissus latifolia (leaves) and Thespesia populnea (flowers)*
- Seed cube technology for *Tectona grandis*

- Presence of anticancerous compounds in the seed extract of *Bixa orellana,* and leaf extract of *Tectona grandis*

B. RESEARCH PROJECTS ON FOREST BIOLOGY AND TREE IMPROVEMENT

Department	Centre	URP	University Core Project	External Funded Project	Total
Forest Biology and Tree Improvement	FC&RI	4	4	3	11

C. REMARKS ON THE ONGOING UNIVERSITY RESEARCH SUBPROJECTS/AICRP/EXTERNALLY FUNDED PROJECTS

Sl. No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
1	CPBG/MTP/PBG/2017/001 Studies on reproductive biology of Annatto (*Bixa orellana* L.)	Dr. M.Umadevi Asst. Prof. (PBG)	January 2017 to December 2019	The objectives were accomplished and hence recommended for closure. Hence the completion report may be submitted on or before July 2019
2	FCRI/MTP/FOR/2015/002 Establishment of an Arboretum of rare and characteristic species of Western Ghats	Dr. S. Vennila Asst. Prof. (For.)	June 2015 to June 2020	To be continued for further assemblage of 100 species with additional funding
3	FCRI/MTP/FOR/2016/001 Screening of Indigenous tree species for pulp and paper production through physical, chemical and strength properties	Dr. S. Vennila Asst. Prof. (For.)	December 2016 to November 2018	The objectives were accomplished and recommended for closure. Hence the completion report may be submitted on or before July 2019
4	CPPS/MTP/NEM/2017/001 Characterization of host suitability of Annatto (*Bixa orellana* L.) to plant - parasitic nematodes (URP)	Dr.P.G.Kavitha Asst. Prof. (Nem.)	January 2017 to December 2019	Project may be closed and the completion report shall be submitted on or before July 2019

5.	FCRI/KDM/FOR/2016/001 Progeny evaluation for higher productivity in *Albizia lebbeck* L. (Benth.) for dry land agroforestry System	Dr. P. Rajendran Associate Prof. (Forestry)	July 2016 to June 2021	The project may be continued
University Core Project				
1	FCRI/MTP/FOR/2018/CP101 Development of Seed Cube Technology for mass propagation of teak (*Tectona grandis*)	Dr. R.Umarani Professor (SST)	2018 to 2020	To be continued with additional funds for the year 2019 -20
2	CPBG/MTP/PBG/2018/CP166 Screening of genetic resources of *Caesalpinia sappan* for wood dye	Dr. P. S. Devanand Asst. Prof. (PBG)	2018 to 2020	To be continued with additional funds for the year 2019 -20
3	Extraction, quantification and chemical characterization of leaf dye of Axle wood (*Anogeissus latifolia* (Roxb.ex DC)	Dr.M.Kiruba Asst. Prof. (For.)	2018 to 2019	To be continued with additional funds for the year 2019 -20
4	FCRI/MTP/FOR/2018/CP018 Genetic improvement and clonal propagation studies in *Santalum album*	Dr. S. Vennila Asst. Prof. (For.)	2018 to 2020	To be continued with additional funds (second year) for standardization of clonal propagation techniques for *Santalum album*
Externally Funded/ICAR Project				
1	TANII/ FCRI/ MTP/DTB/ 2016/ R004 Promotion, Commercialization, Post-Harvest Processing and Industrial Application of Annatto (*Bixa orellana* L.) as a Source of Natural Dye	**PI** Dr.K.Kumaran Professor & Head **CoPI** Dr. P. S. Devanand Asst. Prof. (PBG) Dr. M.Umadevi Asst. Prof. (PBG) Dr.P.Sudha Asst. Prof. (FP&E) Dr. S. Vennila Asst. Prof. (For.) Dr.P.Kumar Asst. Prof. (For) AC&RI, Killikulam	2016 to 2019	To be continued to complete the training workshop

2	EID/FCRI/MTP/DTB/2017/R005 Screening neem genetic resources for higher azadirachtin, establishment of field gene bank and industrial plantations	**PI** Dr.K.Kumaran Professor & Head (DFBT) **CoPI** Dr. P. S. Devanand Asst. Prof. (PBG) Dr. M.Umadevi Asst. Prof. (PBG)	2017 to 2022	To be continued to assemble neem germplasm from Rajasthan and Gujarat Further expansion of industrial plantation of neem over an area of 400 acres during 2019-20
3	AICRP/FOR/MTP/FOR/002 AICRP on Potential Crops	Dr. P. S. Devanand Asst. Prof. (PBG)	Since 1982	To be continued
4.	DST/AEC/KUM/2018/R008 Development of Technologies for Extraction and Dormancy Reduction of Teak Seeds	Dr.P. Masilamani Dean, ADAC&RI Trichy	23.08.2018 to 08.02.2021	The project may be continued

D. GENERAL REMARKS

- *Syzygium malaccense* may be explored for extraction of dye.
- Seed ball technique shall be attempted to increase the tree cover of FC&RI campus.
- The utility and properties of grain amaranthus and *Salina espanica* will be studied.
- Collection and assemblage of new trees from the nine forest types of Tamil Nadu to be taken up.

E. ACTION PLAN (2019 - 2020)

Theme 1: Collection, Assemblage and Evaluation of the germplasm of prioritized tree species

Theme leader	Dr.K.Kumaran, Professor and Head		
Theme Activity	**Name of the Scientist and centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Collection Assemblage and Evaluation of Natural dye yielding species	Dr.K.Kumaran Professor and Head Dr.P.S.Devanand Asst. Prof. (PBG) Dr.M.Kiruba Asst. Prof. (For) Dr.S.Vennila Asst. Prof. (For) FC&RI, Mettupalayam Dr.P.Kumar Asst. Prof. (For) AC&RI, Killikulam	Germplasm collection and establishment of the following species *Bixa orellana* *Wrightia tinctoria* *Biancaea sappan* *Anogeissus latifolia*	Superior genotypes with high dye content
Collection, assemblage and evaluation of	Dr.K.Kumaran Professor and Head Dr.P.S.Devanand	Germplasm collection and assemblage of *Azadirachta indica*	Superior genotypes with high oil and aza

Neem genetic resources	Asst. Prof. (PBG) Dr.S.Vennila Asst. Prof. (For) FC&RI, Mettupalayam Dr.P.Kumar Asst. Prof. (For) AC&RI, Killikulam		contents
Collection, assemblage and evaluation of *Simarouba glauca*	Dr.S.Vennila Asst. Prof. (For) Dr.K.Kumaran Professor and Head FC&RI, Mettupalayam	Germplasm collection and assemblage of *Simarouba glauca*	Screening of superior genotype with high oil content
Collection, assemblage and evaluation of genetic resources of potential crops	Dr.P.S.Devanand Asst. Prof. (PBG) Dr.K.Kumaran Professor and Head FC&RI, Mettupalayam	Germplasm collection, assemblage and evaluation of Amaranthus spp & *Salvia hispanica*	High yielding varieties in Amaranthus and *Salvia hispanica*

Theme 2: Genetic Improvement and Varietal Development

Theme leader	Dr.K.Kumaran, Professor and Head		
Theme Activity	**Name of the Scientist and centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Progeny Evaluation Trials in *Azadirachta indica*	Dr.K.Kumaran Professor and Head Dr.P.S.Devanand Asst. Prof. (PBG) Dr.M.Kiruba Asst. Prof. (For) Dr.S.Vennila Asst. Prof. (For) FC&RI, Mettupalayam	Evaluation of Progenies through multilocation progeny evaluation trials *viz.,* Mettupalayam Pathamadai Sivagangai Thiyagavalli	High yielding varieties in Neem and *Annatto*
Progeny Evaluation Trials in *Bixa orellana*	Dr.K.Kumaran Professor and Head Dr.P.S.Devanand Asst. Prof. (PBG) FC&RI, Mettupalayam Dr.P.Kumar Asst. Prof. (For) AC&RI, Killikulam	Mettupalayam Killikulam Periyakulam	

Theme 3: Development of seed cube technology for rapid propagation

Theme leader	Dr.R.Umarani, Professor (SS&T)		
Theme Activity	**Name of the Scientist and centre**	**Works to be carried out**	**Deliverable/ expected outcome**
Standardizing the enhancement techniques for improving seed germination and seed cube technology	Dr.R.Umarani Professor (SS&T) FC&RI, Mettupalayam	Standardizing the seed cube techniques for *Albizzia lebbek* *Azadirachta indica* *Pongamia pinnata* *Tamarindus indica* *Tectona grandis* *Thespesia populnea*	Seed cube techniques for rapid propagation and afforestation

IV. DEPARTMENT OF SILVICULTURE & NRM

A. DECISION MADE ON OFT

FOR ADOPTION

- Local yield table in Neem (*Azadirachta indica*) is developed for western agroclimatic zone
- Yield prediction model for Neem (*Azadirachta indica*) grown in western agroclimatic zone is developed
- Standard stem timber
- Y= (-0.65) + (0.006*Age) + (3.54* Diameter)
- Standard stem small wood
- Y= (-0.226) + (-0.013*Age) + (0.92*Diameter) + (0.097*No. of branches)
- Roasting of Tamarind seed at 105 degree Celsius for 10 min using seed roaster gives market preferred creamy white Tamarind Kernel Powder.
- Profenophos 50 EC @ 2 ml/litre is recommended for management of defoliators and sucking pest in *Ailanthus excelsa*.
- Azadirachtin 10,000 ppm @ 1 ml/litre is recommended for management of defoliators and sucking pest in *Ailanthus excelsa*.

FOR OFT

1.Precision silviculture techniques for *Neolamarckia cadamba* and other indigenous fast growing tree species.

Centres:

- Coimbatore district
- Thiruvannamalai district
- Sivagangai district

Treatment Details

T_1 - Irrigation level at 75 % PE and fertigation @ 100 % RDF (150:100:100 kg N,P and K ha-1

T_2 - Irrigation level at 100 % PE and fertigation @ 100 % RDF (150:100:100 kg N,P and K ha-1

T_3 - Irrigation level at 125 % PE and fertigation @ 100 % RDF (150:100:100 kg N,P and K ha-1

T_4 - Irrigation level at 100 % PE and fertigation @ 75 % RDF (150:100:100 kg N,P and K ha-1

T_5 - Irrigation level at 100 % PE and fertigation @ 100 % RDF (150:100:100 kg N,P and K ha-1

T_6 - Irrigation level at 100 % PE and fertigation @ 125 % RDF (150:100:100 kg N,P and K ha-1

T_7 - Control

Design: FRBD

Replication: No. of plants per Replications - 4

Observations to be recorded :

- Biometric parameters (Height, collar diameter, diameter at breast height, Number of branches etc.)
- Biochemical characters: Chlorophyll, A, Chlorophyll B, total Chlorophyll
- Plant nutrients: NPK uptake
- Soil Nutrients: NPK and Soil organic carbon

2. Identified promising tamarind varieties need to be tested by OFT and MLT.

Centres:

- Theni district
- Coimbatore district
- Thiruvannamalai district

Treatment Details

- Four tamarind clones
- **Check:** Tamarind PKM1

Design: FRBD

Replication: No. of plants per Replications - 3

Observations to be recorded :

- Biometric parameters namely Height, collar diameter, diameter at breast height, Number of branches etc.
- Flowering behaviour
- Fruit yield

3. Standardization of compatable host for promotion of sandal cultivation

Centres:

- Tuticorin district
- Coimbatore district
- Thiruvannamalai district
- Salem district

Treatment Details

T_1 - Sandal + *Acacia nilotica*
T_2 - Sandal + *Cassia siamea*
T_3 - Sandal + *Albizia saman*
T_4 - Sandal + *Wrightia tinctoria*
T_5 - Sandal + *Dalbergia sissoo*
T_6 - Sandal + *Albizia amara*
T_7 - Sandal + *Pongamia pinnata*
T_8 - Sandal + *Casuarina equisetifolia*
T_9 - Sandal + *Pterocarpus marsupium*
T_{10} - Sandal + *Albizia lebbeck*
T_{11} - Control

Design: RBD

Replication: No. of plants per Replications - 3

Observations to be recorded :

- Biometric parameters (Height, collar diameter, diameter at breast height, Number of branches etc.)
- Biochemical characters: Chlorophyll, A, Chlorophyll B, total Chlorophyll
- Plant nutrients: NPK

4. Promising identified *Neolamarckia cadamba* clones need to be tested by OFT and MLT.

Centres:

- Tuticorin district
- Coimbatore district
- Thiruvannamalai district
- Salem district

Treatment Details

Four Cadamba clones

Check: Cadam MTP1

Design: RBD

Replication: No. of plants per Replications - 3

Observations to be recorded :

- Biometric parameters (Height, collar diameter, diameter at breast height, Number of branches etc.)
- Testing for pulp wood quality

5. Management of *Eligma narcissus* in *Ailanthus excelsa* through stem treatment

Centres:

- Coimbatore district
- Trichy district
- Krishnagiri district

Treatment Details

T_1 - Swabbing the stem with grease

T_2 - Swabbing the stem with castor oil

T_3 - Swabbing the stem with coal tar

T_4 - Untreated control

Design: RBD

Replication: No. of plants per Replications - 5

Observations to be recorded :

- Number of pupae per stem
- Biometric parameters (Height, DBH and volume)

FOR INFORMATION

- The water requirement for Red Sanders is 0.68 litres / day / seedling at 100 % PE for the first year cultivation
- The water requirement for Red Sanders 1.05 litres / day / sapling at 100 % PE for the second year cultivation
- Seedless Tamarind variety is identified for exploiting pulp utility

- *Terminalia arjuna, Millingtonia hortensis, Hibiscus tiliaceus* and *Melia dubia* were found suitable for sewage water.
- Suitable Sandal host identified for initial stages of sandal establishment
  - Nursery stage: ***Alternanthera sessilis***
  - Initial field establishment: ***Sesbania grandiflora***
- *Helopeltis antonii* was recorded as potential sucking pest in *Ailanthus excelsa* causing complete drying of terminal shoots (First time documented in *Ailanthus excelsa*).
- Fulgorid bug, *Kalidasa lanata* Drury was documented as damaging sucking pest of *Ailanthus excelsa* in nursery (First time documented in *Ailanthus excelsa*).
- Eradication of *Acacia mearnsii* in natural forest promoted regeneration of 10 native tree species.
- Eradication of *Prosopis juliflor**a*** in natural forest resulted regeneration of six native tree species.
- Eradication of *Lantana camara* in natural forest promoted regeneration of 13 native tree species***.***

B. RESEARCH PROJECTS ON SILVICULTURE & NRM

Department	Centre	URP	University Core Project	External Funde Project	Total
Silviculture & NRM	FC&RI	03	03	05	11

C. REMARKS ON THE ONGOING UNIVERSITY RESEARCH PROJECTS / AICRP/ EXTERNALLY FUNDED PROJECTS

Sl.No	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
1	FCRI/MTP/FOR/2017/001 Studies on water requirement for early growth of *Pterocarpus santalinus*	Dr.S.Radhakrishnan Associate Professor (Forestry)	01.02.2017 to 31.01.2020	Nutrient uptake study need to be attempted Water spread and depletion estimation needs to be taken up. The project may be continued.

2	NRM/MTP/ENS/2016/001 Development of biofloating technology for odour management in sewage water	Dr.M.Prasanthrajan Associate Professor (Environmental Science)	01.12.2016 to 30.11.2019	Screened tree species suitable for sewage need to be tested in mount planting technique under sewage lagoon. Rhizosphere micro flora of screened tree species may be studied. Evolving suitable biofloating techniques for sewage water. The project may be continued.
3	CPPS/MTP/ENT/TBB/2019/ 001 Development of tree based biopesticides for the management of diamond back moth, *Plutella xylostella*	Dr.M. Suganthy, Associate Professor (Agrl. Entomology)	01.01.2019 to 31.12.2021	Leaves of selected tree species were collected, shade dried and powdered for carrying out bioassay Powdered leaf samples were subjected to solvent extraction (ethanol, methanol and hexane) using soxhlet apparatus
University Core Project				
1	FCRI/MTP/FOR/2018/CP039 Developing modern Silvicultural practices for early establishment of Sandal (*Santalum album*)	Dr.S.Radhakrishnan Associate Professor (Forestry)	01.04.2018 to 31.03.2019	Permanent host for field establishment in sandal need to be studied

				with different tree species Supplementary nutrient requirement need to be tested. Rhizosphere micro flora for host compatibility may be studied. The project may be continued by submitting extension proposal
2	FCRI/MTP/FOR/2018/CP099 Standardizing precision silvicultural techniques for *Enterolobium cyclocarpum* and *Neolamarckia cadamba* clones for pulpwood utility	Dr. M. Sivaprakash Assistant Professor (Forestry)	01.04.2018 to 31.03.2019	Clonal multiplications of *Enterolobium cyclocarpum* need to be tested with seedling coppice. Seed sources of *Enterolobium cyclocarpum* need to be assembled. Identified source of *Neolamarckia cadamba* need to be multiplied for field testing. Field experiment need to be initiated. The project may be continued by submitting extension proposal.

3	FCRI/TRY/FOR/2018/CP097 Studies on the influence of precision silvicultural techniques on *Neolamarckia cadamba* (Roxb.) clones in Trichy	Dr. S.Manivasakan Asst. Professor (Forestry)	December 2018 to November 2021	Clonal multiplications of *Neolamarckia cadamba* was over. Field experiment need to be initiated. Project may be continued
External Funded Project				
1	IINRG/FCRI/MTP/DOS/2014/R002 Harvesting, processing and value addition of Tamarind seed gum	Dr.A. Balasubramanian Professor and Head	01.08.2014 to 31.03.2020	Intensive silvicultural management for tamarind under high density planting need to be continued Assemblage of tamarind germplasm needs to be continued. Value addition using tamarind gum as an additive to be taken up. Assemblage of tree gum garden need to be continued. The project may be continued.
2	GoTN/FCRI/MTP/DOS/2017/R009 Developing timber yield table for Neem and Albizia grown in western agro climatic zone of Tamil Nadu	Dr.A. Balasubramanian Professor and Head	01.02.2018 to 31.01.2019	The consolidation of data and developing yield table and yield model to be taken up and the work is to be completed within the project period. The project

				shall be closed and the completion report shall be submitted on or before July 2019.
3	PPV/FOR/MTP/SIL/2009/R001 Distinctiveness, Uniformity and Stability (DUS) test centre for Neem, Karanj, and Jatropha under PPV & FR Authority at FC&RI, TNAU, Mettupalayam	Dr.A. Balasubramanian Professor and Head	01.04.2018 to 31.03.2020	The DUS testing for varietal registration in Neem, Karanj, and Jatropha to be continued based on the funding from PPV&FR Authority The project may be continued.
4	GoTN/FCRI/MTP/DOS/2017/R007 Developing Growth Yield Table for seed stand and seed orchard of *Ailanthus excelsa* in Tamil Nadu	Dr.S.Radhakrishnan Associate Professor (Forestry)	01.02.2018 to 31.01.2019	Construction of yield table need to be taken up by utilising the biometric data collected for 10 age classes in 5 agro-climatic zones The seed yield for different age classes need to be documented The project shall be closed and the completion report shall be submitted on or before July 2019.
5	GoTN/FCRI/MTP/DOS/2017/R008 Study on Ecological succession in Invasive species eradicated forest areas	Dr.S.Radhakrishnan Associate Professor (Forestry)	01.02.2018 to 31.01.2019	The project shall be closed and the completion report shall be submitted on or before July 2019.

D. GENERAL REMARKS

- Precision silviculture models to be demonstrated in farmers' field.
- Characterisation and conservation of Tamarind tree in Alvarthirunagari Perumal temple may be taken up.
- Assessment of sandal population in Horticulture Research Station, Yercaud.
- Trees in connection with noise reduction/ transmission studies may be attempted.
- Management of insect pests in the farm plantations.

E. ACTION PLAN (2019 - 2020)

Theme 1: Production Silviculture

Theme leader	Dr. A.Balasubramanian, Professor & Head		
Theme Activity	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
Developing precision silvicultural techniques for farm grown tree species	Dr. A.Balasubramanian Dr. I.Sekar Dr. M.P.Divya Dr. P.Rajendren Dr. S.Radhkrishnan Dr. M.Sivaprakash Centre: FC&RI Dr. R.Jude Sudhagar AC&RI, Kudimiyanmalai Dr. B.Sivakumar AC&RI, Valavachanur	Establishing filed trial short and long rotational tree species Scheduling of water and nutrient Assessment of growth by recording biometric values	Precision silvicultural techniques will be developed for farm grown trees
Standardising precision silvicultural techniques for *Enterolobium cyclocarpum* and *Neolamarckia cadamba* clones	Dr. M.Sivaprakash Dr. A.Balasubramanian Dr. S. Umesh Kanna Dr. S. Manivasakan Centre: FC&RI	Establishing filed trail in different location Site specific water and nutrient scheduling Assessment of growth by recording biometric values	Location specific precision silvicultural techniques for *Enterolobium cyclocarpum* and *Neolamarckia cadamba* clones will be evolved
Developing intensive silvicultural management for Tamarind under high density planting	Dr. A.Balasubramanian Dr. S.Radhakrishnan Dr. M.Sivaprakash Dr. M.Suganthy Centre: FC&RI	Imposing Florien application for flower induction Imposing different pruning intensities Assessing flowering behavior and recoding floral biology	Precision Silvicultural techniques for Tamarind under high density planting technique will be standardized
Developing seedless tamarind source	Dr.A.Balasubramanian Dr. M.Sivaprakash Dr.S.Radhakrishnan Centre: FC&RI	Survey for seedless tamarind genetic resources Assembling clones of seedless tamarind	Seedless tamarind resource will be assembled and exploited for higher pulp yield

Development of pest management strategies against insect pests of *Ailanthus excelsa*	Dr.M.Suganthy Dr.A.Balasubramanian Dr. M. Senthil Kumar Centre: FC&RI	Level of parasitisation / predation by natural enemies of major pests of *A. excelsa* will be recorded and possibility of utilizing them in pest management will be studied. Tritrophic interaction of pests and natural enemies in ailanthus ecosystem will be studied.	Identification of potential bio-control agents in Ailanthus pest management
Yield estimation in Albizia grown in western agro-climatic region	Dr. A.Balasubramanian Dr. M.Sivaprakash Dr. S.Radhakrishnan Dr. R. Ravi Kumar Centre: FC&RI	Recording biometric values of Albizia for different age class Construction of yield table	Yield table will be developed for Albizia Yield prediction model will be developed for Albizia

Theme 2: Conservation Silviculture

Theme leader	Dr. S. Radhakrishnan, Associate Professor		
Theme Activity	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
Developing silvicultural techniques for the conservation and promotion of Red sanders and Sandal	Dr. S.Radhakrishnan Dr. A.Balasubramanian Dr. M.Sivaprakash Dr. S. Umesh Kanna Centre: FC&RI Dr. P. Kumar AC&RI, Killikulam	Compatible host for sandal for early field establishment will be evaluated. Water requirement for early growth of Red sanders will be determined. Supplementary nutrient requirement for sandal will be assessed. Rhizosphere micro flora will be estimated for host compatibility in sandal	Comprehensive silvicultural strategies for Sandal cultivation will be evolved especially for early growth stages Water scheduling for Red sanders will be standardized to promote early growth
Assemblage of lesser known gum yielding trees	Dr.A.Balasubramanian Dr. S.Radhakrishnan Centre: FC&RI	Establishing tree gum garden Growth assessment of trees	Lesser known gum yielding trees will be promoted among tree growers.

Assemblage of Acacia species for exploiting gum yielding potential	Dr. M.Sivaprakash Dr. A.Balasubramanian Dr. S. Vennila Dr. M.Kiruba Dr. S. Umesh Kanna Centre: FC&RI Dr. B. Sivakumar AC&RI, Valavachanur	Different Acacia species will be established Diameter class suitability for gum tapping will be assessed	Different Acacia species will be assembled for exploiting gum yielding potential
Developing silvicultural strategies for exploiting gum tapping in Neem and *Acacia leucopholea*	Dr. S.Radhakrishnan Dr. A.Balasubramanian Dr. M.Sivaprakash Centre: FC&RI	DBH will be recorded Grouping of trees for different diameter class Assessing gum yielding by imposing gum booster treatment	Silvicultural strategies will be evolved for gum tapping in Neem and *Acacia leucopholea*
Protection of tree varieties in Neem, Pungam and Jatropha through PPFRA regulations	Dr. A.Balasubramanian Dr. S.Radhakrishnan Dr. M.Sivaprakash Centre: FC&RI	Recording DUS descriptors for the verities filed by PPVFRA Conducting DUS test for the mandatory crops	DUS testing will be done based on PPVFRA regulation for the mandatory crops

Theme 3: Forest And Climate Resilience

Theme leader	Dr. M. Prasanthrajan, Associate Professor (Env. Science)		
Theme Activity	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
Development of bio floating techniques for water pollution control	Dr. M. Prasanthrajan Centre: FC&RI	Development of bio floating techniques for water pollution control Growth parameters and Rizhosphere microflora of identified tree species will be recorded Screened tree species suitable for sewage will be tested in mount planting technique under sewage lagoon.	Biofloating techniques for water pollution control
Screening of indigenous tree species for urban air pollution abatement	Dr.A.Balasubramanian Dr. M.Prasanthrajan Dr. S.Radhakrishnan Centre: FC&RI	Air Pollution Tolerance Index of indigenous trees will be recorded	Suitable tree species for urban planting

DEPARTMENT OF SERICULTURE

A. Decisions made on OFT

FOR OFT

1. Effect of probiotics on the yield parameters of silkworm cocoon

Centres:

Three farmers field at Annur, Avinashi and Udumalpet

Treatment Deatils

T1: Saccharomyces boulardii 3%
T2: Lactobacillus rhamnosus 3 %
T3: Untreated control
Design : CRBD
Replications : 7
Silkworm : Bivoltine

Observations to be recorded:

a) Larval weight
b) Cocoon weight
c) Pupal weight
d) Shell weight
e) Shell ratio
f) Effective rate of rearing

FOR INFORMATION

- Feeding the silkworm larvae with mulberry leaves treated with mineral combination of Zinc @ 100 ppm + Magnesium @ 200ppm + Potassium @ 100 ppm significantly improved larval weight (15.58%), cocoon weight (15.00%), shell ratio (13.85%) and effective Rate of Rearing (8.43%) of silkworm over the control
- Application of probiotics Lactobacillus rhamnosus and Saccharomyces boulardii @ 3% to CSR 2 hybrids silkworm larvae signifivantly increased the commercial characteristics *VIZ.,* cocoon weight, pupal weight , shell weight and shell ratio.

- Silkworm excreta @ 400g/plant was found to be superior and recorded the highest mulberry growth and yield parameters VIZ., shoot length(98.7 cm), number of branches per plant (9.45), number of leaves per branch (27.67), internodal length (3.87 cm), 100 leaves weight (440.3g)and leaf yield (12,608 kg/ha/year) and was followed by silkworm excreta, 300g/plant
- Silkworm excreta @ 400g/plant recorded the highest silkworm economic traits viz., larval weight2.76(g), cocoon weight 1.41(g), shell weight 0.21(g), shell ratio 17.51 (%) and cocoon yield (147 kg/ha/harvest) and was followed by silkworm excreta 300g/plant.

B. RESEARCH PROJECTS ON SERICULTURE

Department	Centre	URP	University Core Project	External Funded Project	Total
Sericulture	FC&RI Mettupalayam	05	05	-	10

C. REMARKS ON THE ONGOING UNIVERSITY RESEARCH SUB PROJECTS/ AICRP/EXTERNALLY FUNDED PROJECTS

Sl. No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
1	CPPS/MTP/SER/2016/001 An economic analysis of cocoon production in traditional and non-traditional sericulture areas of Tamil Nadu	Dr.S.Susikaran Asst. Prof (Sericulture)	July 2016 to Jun 2019	The project shall be closed and the completion report shall be submitted on or before July 2019
2	CPPS/MTP/SER/2017/001: 428 Value addition to Mulberry Silkworm Rearing Waste and their impact on both Mulberry and Silkworm	Dr.R.Shanmugam Asst. Prof (Sericulture)	May 2017 to Apirl 2020	The objectives may be discussed with Director (CMS), Director (NRM) and the suggestions may be included before laying out next trial.
3	CPPS/MTP/SER/2017/001: 497 Effect of minerals on growth and development of silkworm, *Bombyx mori L.* and their impact influence on cocoon economic traits	Dr.K.A.Murugesh Asst. Prof (Sericulture)	May 2017 to Apirl 2020	The silk characters may be studied. The project can be continued
4	CPPS/MTP/SER/2018/CP102 Enhancement of quantitative and qualitative traits in mulberry through mutation breeding	Dr. P. Mangammal Asst. Prof (Sericulture)	November 2018 to October 2020	The Director (CPBG), TNAU and Sugarcane Breeding Institute may be approached for gamma irradiation facilities.
5	FCRI/MTP/SER/2018/CPO42 Effect of probiotics on growth and development of silkworm, *Bombyx mori L.*	Dr.P.Priyadharshini Asst. Prof (Sericulture)	SEptember 2018 to August 2021	The microbial load in the formulation of probiotics should be given.
6	NRM/MTP/ENS/SER/2018/001 Standardization of the dose of additives and inoculums for combined seri-waste composting	Dr.P.Jothimani Asst. Prof (ENS)	July 2018 to June 2021	The experiments carried out should be discussed with Director (NRM), TNAU,Coimbatore
7	FCRI/MTP/SER/2018/CPO43 Evaluation of pharmaceutical properties of sericin	Dr.P.Priyadharshini Asst. Prof (Sericulture)	September 2018 to August 2021	The project can be continued.

8	CPPS/MTP/SER/2019/CP155 Application of Amino acids as exogenous modulator for enhancing productivity and quality of raw silk	Dr.K.A.Murugesh Asst. Prof (Sericulture)	January 2019 to December 2021	The project objectives should be discussed and refined as per the guidance of Director (CMS), TNAU, Coimbatore
9	CPPS/MTP/SER/2019/CP155 Application of oil cakes and assessment of their impact on mulberry crop and silkworm	Dr.R.Shanmugam Asst. Prof (Sericulture)	December 2018 to November 2021	The mechanism of aminoacids in improving the economic traits of silk worm may be elaborated. The project can be continued
10	NRM/MTP/SAC/2019/001 Status and dynamics of soil nutrients and carbon sequestration potential with organic manures in mulberry growing soil	Dr.R.Rajeswari Asst. Prof (SS&AC)	March 2019 to February 2022	The project can be continued. The project details should be discussed with Director (CMS)

D. GENERAL REMARKS

- Mulberry gardenand germplasm collection may be established in the area to be allotted at ARS, Bhavanisagar.
- Preparatory works for the establishment of field laboratory for silkworm rearing may be carried out.
- Nutrient management studies in mulberry shall be taken up.
- Value added products in sericulture shall be strengthened.
- Mulberry booster shall be developed.

E. Action Plan 2019-2020

Theme 1: Host plant production and management

Theme Leader	**Dr.S.V.Krishnamoorthy**		
Theme Activity	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
Utilization of resources for enhancing mulberry leaf yield	Dr.R.Jayaramasoundari Assistant Professor (SS&AC) Dr.P.Mangammal Asst. Prof (Sericulture) Dr.S.Susikaran Asst. Prof (Sericulture)	Enhancing leaf yield potential of mulberry through low cost soil amendments	Best identified soil amendments will be used for increasing leaf yield

Assembling, evaluation of genetic resources of mulberry	Dr.P.Mangammal Asst. Prof (Sericulture) Dr.R.Shanmugam Asst. Prof (Sericulture)	Mulberry breeding work should be intiated Studying the effect of different mutagens on morphological and growth parameters of mulberry	The suitable mulberry clone for Tamil Nadu condition will be identified
Management of mulberry root rot with endophytes	Dr.P.Renukadevi Associate Professor (Plant Pathology)	Exploring mulberry endophytes for the management of mulberry root rot and growth promotion	Effective management of mulberry root rot will be attained
Studies on soil nutrient dynamics of mulberry	Dr.R.Rajeswari Assistant Professor (SS&AC)	Status and dynamics of soil nutrients and carbon sequestration potential with organic manures in mulberry growing soil will be studied	.Efficient fertilizer usage will be obtained to improve mulberry leaf yield

Theme 2: Silkworm production and management

Theme Leaders	**Dr.S.V.Krishnamoorthy**		
Theme Activity	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
Effect of probiotics on growth and development of silkworm, *Bombyx mori L.* "	Dr.P.Priyadharshini Asst. Prof (Sericulture)	To study the impact of probiotics on enzyme activity of silkworm races. Exploring silk worm gut bacterial microbial community for immunity and enhance cocoon production	Economic traits of silkworm will be improved
Effect of minerals on growth and development of silkworm, *Bombyx mori L.*and their impact influence on cocoon economic traits	Dr.K.A.Murugesh Asst. Prof (Sericulture)	Studying the effects of mineral combination on cocoon and silk related traits. Analysing the protein content in silk gland and cocoon	Increase in cocoon quality and yield

Evaluation of different eco-races of eri silkworm	Dr. S. Susikaran Asst. Prof (Sericulture) Dr.P. Mangammal Asst. Prof (Sericulture)	To evaluate the different eco- races of eri silkworm	Suitable eri-silkworm will be identified

Theme 3 Value addition in Sericulture

Theme Leaders	**Dr.G.Umapathy**		
Theme Activity	**Name of the Scientist and centre**	**Work to be carried out**	**Deliverables / Expected outcome**
Value addition to Mulberry Silkworm Rearing Waste and their impact on both Mulberry and Silkworm	Dr.R.Shanmugam Asst. Prof (Sericulture) Dr.P.Jothimani Assistant Professor (Env.Sciences)	To study the impact of seriwaste-compost on mulberry leaf yield and silkworm economic traits. To assess the physio-chemical and biological properties of seri waste applied soil	Increase of mulberry leaf yield and silkworm economic traits

29th Forestry and 10th Sericulture Scientists Meet 2019

Vice Chancellor Remarks

- Impact analysis of the released varieties to be studied
- Consortium to be prepared in consultation with Professor and Head, Floriculture and Landscape Architecture for decomposing the fallen leaves/twings/debris in Agroforestry system
- Intervention may be made on the invasive weeds like *Lantana Camera*
- Pruning study can be taken up in Neem with different spacing
- Aerial seeding of Teak and other tree species seeds with seed ball developed by Seed Technologist for revival of forest area in FC&RI, Mettupalayam Campus. Sowing to be taken up in first week of August, 2019. Photographic documentation to be done both during before sowing and after sowing for germination/establishment during end of August, 2019.
- Survey to be taken up for the oldest sandal wood plantation for host plant survival.
- Farmers observed Tamarind trees in the village named "Alwar Thirunagiri" near Thiruchendur with larger leaflets without seed set. The area may be visited for collection and regeneration
- Studies on the prevention of the damages by peacock and wild boar to be taken up.
- Studies on forestry by products need to be taken up
- Area will be allocated at ARS, Bhavanisagar for field trials in Sericulture.

Director of Research

Way Forward

- Augment forestry tree breeding / conservation programs
- Standardize agro-techniques to promote forest wealth (Seed ball, precision agriculture, clonal propagation, companion cropping)
- Integrated Farming System (IFS) for forestry can be evolved
- Value addition to forestry process & products
- Develop GIS / Sensor based monitoring systems to assess forest wealth and wild life management
- Strengthen research & development activities in sericulture

VII. CONTACT DETAILS OF SCIENTISTS PARTICIPATED IN THE CSM

Sl. No.	Name of the Scientist	Mobile No.	E mail ID
I.	**Department of Agroforestry**		
1	Dr. K.T. Parthiban Professor and Head	8870808289	ktparthi2001@ gmail.com
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