

**TAMIL NADU AGRICULTURAL UNIVERSITY**

**PROCEEDINGS**

**35<sup>th</sup> HORTICULTURAL SCIENTISTS' MEET 2019  
(April 24-25, 2019)**

**Lead Center**  
Horticultural College and Research Institute  
Coimbatore

Directorate of Research  
Tamil Nadu Agricultural University  
Coimbatore 641 003

**2019**

## PROCEEDINGS

### 35<sup>th</sup> HORTICULTURAL SCIENTISTS' MEET 2019 (April 24-25, 2019)

The 35<sup>th</sup> Horticulture Scientists Meet was held during April 24-25, 2019 at the Tamil Nadu Agricultural University, Coimbatore. **Dr. N. Kumar**, Vice Chancellor appreciated all the horticulture scientists for the accomplishments made during the year 2018-19. **Dr. K.S. Subramanian**, Director of Research, welcomed the gathering and briefly presented the research highlights of horticulture in the past one year. He flagged of various strategies for further improvement such as Conjunctive use of classic and molecular breeding methods to evolve varieties / hybrids in horticultural crops, Development of technology capsules for smart farming, vertical farming and roof gardening, Minimizing post-harvest losses in perishables using nanotechnologies, Establishment of Core themes and teams to manage nematodes and viral diseases and Mechanization for horticultural production systems and product development. **Dr. K.R. Ashok**, Director (CARDS) presented the production scenarios of horticulture in India and Tamil Nadu. The action taken reports on the previous Scientists Meet was presented by Dr. L. Pugalendi, Dean (Horticulture), HC & RI, Coimbatore . During the concurrent sessions, the technical directors and Deans of Horticulture Colleges had reviewed the on-going university research projects (114), action plan projects (2), core projects (12) and AICRP (12) besides Externally Funded Projects (14). During the plenary session on 25<sup>th</sup> April, 2019 the outcome of the review process was presented by the HODs **Dr. P. Paramaguru**, Dept. of Fruit Science, **Dr. R. Swarnapriya**, Vegetables Science, **Dr. S. Balakrishnan**, Dept. Spices & Plantation Crops and **Dr. K. Rajamani**, Dept. Floriculture & Landscape Architecture and in-charge for Medicial & Aromatic Plants besides **Dr. K. Prabakar**, Director (CPPS). During the conclusion of the event, the Vice Chancellor suggested the scientists to get ready with the required data for the variety release in December 2019.

## **The proceedings of the meet is furnished as below**

### **I. Fruit Science**

- A. General recommendations
- B. Remarks on the individual university research projects.
- C. Cultures under MLT/ART/FLD
- D. Action plan: 2019 – 2020

### **II. Vegetable Science**

- A. General recommendations
- B. Remarks on the individual university research projects.
- C. Cultures under MLT/ART/FLD
- D. Action plan: 2019 – 2020

### **III. Spices and Plantation Crops**

- A. General recommendations
- B. Remarks on the individual university research projects.
- C. Cultures under MLT/ART/FLD
- D. Action plan: 2019 – 2020

### **IV. Floriculture and Landscape Architecture**

- A. General recommendations
- B. Remarks on the individual university research projects.
- C. Cultures under MLT/ART/FLD
- D. Action plan: 2019 – 2020

### **V. Medicinal and Aromatic Plants**

- A. General recommendations
- B. Remarks on the individual university research projects.
- C. Cultures under MLT/ART/FLD
- D. Action plan: 2019 – 2020

### **VI. Plant Protection**

- A. General recommendations
- B. List of Projects (URP/AICRP/EFP)
- C. Remarks on the individual university research projects.
- D. Technologies for Adoption/Information
- E. Action plan: 2019 – 2020

### **VII. Closing remarks & way forward**

### **VIII. Participants**

## I. Fruit Science

### A. General Recommendations

#### Crop improvement

S.No	Remarks	Action & Centre
1.	In mango, dwarfing rootstocks available at Bengaluru regions of Karnataka may be collected and included in the existing germplasm. It may be utilized for grafting Imampasand & Banganapalli varieties	HC & RI, Periyakulam
2.	Salt tolerant mango root stocks may be collected from private farms and other sources and it may be included in the existing mango germplasm	HC & RI, Periyakulam
3.	In banana, multiplication of pre release culture H212 may be carried out through tissue culture in TNAU or in collaboration with private companies.	Dept. of Fruit Crops, HC & RI, Coimbatore
4.	Field multiplication of pre- release banana culture H96/7 may be carried out through nearby centers	Action-ARS, Bhavanisagar
5.	Released TNAU papaya CO8 variety has to be commercialized.	Dept. of Fruit Crops, HC & RI, Coimbatore
6.	Papaya pre-release culture (sel.C1-33) to be tested in Virinjipuram centre for PRSV resistance along with check Red Lady grown in Vellore and Tindivanam region	Dept. of Fruit Crops, HC & RI, Coimbatore ARS, Virinjipuram
7.	In grapes, re-standardize the rootstock growth and performance. Steps may be taken to boost up the growth of rootstocks to increase the cane girth.	GRS, Theni
8.	Students may be allotted to GRS, Theni to take up research work	HC & RI, Coimbatore & GRS, Theni
9.	GRS, Theni may concentrate on juice and table purpose varietal development	GRS, Theni
10.	In grapes, budsports available in the farmer's field may be identified and utilized in breeding programme	GRS, Theni
11.	Cost of economics may be worked out for 'Y' trellis training system and the suitable one taken for the farmers adoption	GRS, Theni
12.	In guava, half-sib population of Arka Kiran may be tested in Theni region	Dept. of Fruit Crops HC & RI, Coimbatore and HC & RI, Periyakulam
13.	In guava, the identified superior genotypes at HC & RI (W) Trichy may be vegetatively propagated and handed over to HC & RI, Periyakulam for conservation	Dept. of Fruit Crops HC & RI, Periyakulam & HC & RI (W), Trichy
14.	A package for nematode management in guava may be developed by involving scientists from nematology, microbiology, environmental science and soil science	Departments of Agrl. Microbiology, Environmental Science, Soil Science & Nematology
15.	In acid lime, the ploidy status of identified tetraploid mutant may be confirmed through flow cytometry.	Department of Fruit Crops, HC & RI, CBE

16.	Collection of elite avocado genotypes available at Vandiperiyar, Kerala may be done and included in the existing germplasm collection at HRS, Thadiyankudisai	HRS, Thadiyankudisai & Dr. A. Subbiah, Asst. Prof. (Hort.), GRS, Theni
17.	Identified superior jackfruit genotypes at AC&RI, Kudimiyamalai may be vegetatively propagated and handed over to VRS, Palur, and HC & RI, Periyakulam for conservation.	AC & RI, Kudimiyamalai, VRS, Palur & HC & RI, Periyakulam
18.	A team of scientists comprising of Horticulture, Pathology, Nematology, Soil Science and Environmental Science should visit the traditional mandarin growing areas of lower Pulney hills and assess the decline in productivity of mandarin over the past 15 years	HC & RI, Coimbatore, HC & RI, Periyakulam HRS, Thadiyankudisai and Director, CPPS
19.	Commercial cultivation of Kiwifruit may be demonstrated widely among the farmers of Upper Pulney hills (Kodaikanal) to enhance the income of the growers	HRS, Kodaikanal
20.	In Jamun, research on seedlessness, alternate bearing and growth regulator studies has to be taken up through PG research programme	HC & RI, Periyakulam
21.	Manila Tamarind types available at HC & RI, Periyakulam may be multiplied and distributed to RRS, Aruppukkottai, AC&RI, Killikulam and DARS, Chettinad for conservation and evaluation	RRS, Aruppukkottai, AC & RI, Killikulam and DARS, Chettinad
22.	Local ecotypes of wood apple may be collected and evaluated	HC & RI, Periyakulam

### **Crop Management**

<b>S.No</b>	<b>Remarks</b>	<b>Action &amp; Centre</b>
1.	The tissue culture protocol for multiplication of banana may be obtained from AC & RI, Killikulam and utilized at HC & RI, Coimbatore.	AC & RI, Killikulam and HC & RI, Coimbatore
2.	In mango & guava, mechanization may be introduced in HDP	HC & RI, Coimbatore Mango Research Station, Paiyur HC & RI, Periyakulam

## B. REMARKS ON ONGOING RESEARCH PROJECTS

### I. CROP IMPROVEMENT

<b>UNIVERSITY RESEARCH PROJECTS</b>			
<b>S.No.</b>	<b>Project Number, Title and Period</b>	<b>Investigator</b>	<b>Remarks</b>
<b>A.MANGO</b>			
<b>Department of Fruit Science, HC &amp; RI, Coimbatore</b>			
<b>1.</b>	<b>HCRI / CBE / HOR / FRU / 2014 / 005</b> Studies on rootstock evaluation and exploitation of polyembryonic rootstocks in mango Period: July, 2014- June, 2019	Dr. R.M.Vijayakumar	The project may be completed and completion report may be submitted.
<b>B.BANANA</b>			
<b>Department of Fruit Science, HC &amp; RI, Coimbatore</b>			
<b>2.</b>	<b>HCRI/CBE/HOR/ FRU/ 2012/001</b> Crop improvement in banana Period: Nov, 2015 – March, 2018	Dr.K.Soorianathasundaram	The completion report may be submitted and new project may be proposed for continuation.
<b>HC &amp; RI (W), Trichy</b>			
<b>3.</b>	<b>HCRI/TRY/FRU/BAN/2014/004</b> Screening of Banana genotypes for sodicity tolerance Period: June, 2014 – May, 2019	Dr. J. Auxcilia	The project may be closed and completion report may be sent.
<b>C. PAPAYA</b>			
<b>Department of Fruit Science, HC &amp; RI, Coimbatore</b>			
<b>4.</b>	<b>HCRI/CBE/HOR/FRU/2012/001</b> Crop improvement in papaya Period: Nov,2012 – March, 2018	Dr.K.Soorianathasundaram	The completion report may be submitted and a new sub-project may be proposed to evaluate the selected intergeneric and intervarietal hybrid progenies for yield, quality and PRSV resistance.
<b>D.GRAPES</b>			
<b>Grapes Research Station, Anaimalayanpatty</b>			
<b>5.</b>	<b>HCRI/TNI/HOR/GRP/2015/001</b> Collection, conservation and evaluation of grape ( <i>Vitis sp.</i> ) germplasm Period: June, 2015 – May, 2019	Dr. A. Subbiah	The project may be closed and completion report may be sent. A new project may be proposed for continuation.

S. No.	Project Number, Title and Period	Investigator	Remarks
<b>E.GUAVA</b>			
<b>Department of Fruit Science, HC &amp; RI, Coimbatore</b>			
6.	<b>HCRI/CBE/HOR/FRU/2013/003</b> Improvement of guava ( <i>Psidium guajava</i> ) through selection and inter-varietal hybridization Period: June, 2013 – July, 2021	Dr. D. Vidhya	The project may be continued. The existing half sib population may be further evaluated. The identified half sib progeny, PG-1-7 may be vegetatively propagated and further evaluated.
<b>HC &amp; RI (W), Trichy</b>			
7.	<b>HCRI/TRY/FRU/GUA/2014/001</b> Screening and evaluation of guava ( <i>Psidium guajava</i> ) germplasm for sodicity tolerance Period: Jan, 2014 – Dec, 2018	Dr. V.P.Santhi	The project may be closed and completion report may be sent.
<b>F. CITRUS – MANDARIN</b>			
<b>HRS, Yercaud</b>			
8.	<b>HCRI/YCD/HOR/FRU/2016/001</b> Survey, collection and evaluation of mandarin orange varieties under Shevaroy condition Period: Jan, 2017- June, 2021	Dr. S. Nanthakumar	The proposal for change of project leader may be submitted. The project may be continued.
<b>Citrus Research Station, Sankarankovil</b>			
9.	<b>HCRI/SAN/HOR/FRU/2017/001</b> Survey and identification of suitable acid lime genotypes for year round production. Period: April 2017 - March 2020	Dr. P.Nainar	The project may be continued and the existing genetic pool may be enriched.
10.	<b>HCRI/SAN/HOR/FRU/2018/001</b> Evaluation and identification of root stocks for improvement of yield and quality of acid lime ( <i>Citrus aurantifolia</i> Swingle.)` Period: October 2018 - September 2022	Dr. P.Nainar	The project may be continued as per the objectives.
<b>G.JACKFRUIT</b>			
<b>AC &amp; RI, Kudimiyamalai</b>			

<b>11.</b>	<b>HCRI/KDM/HOR/FRU/2016/001</b> Identification and evaluation of high yielding good quality jack genotypes suitable for dry tracts of Tamil Nadu Period: June, 2015 – May, 2019	Dr. R. Jayavalli	Identified promising genotypes may be vegetatively propagated and may be distributed to VRS, Palur and HC & RI, Periyakulam for conservation. The project may be closed and completion report may be sent.
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<b>S.No.</b>	<b>Project Number, Title and Period</b>	<b>Investigator</b>	<b>Remarks</b>
<b>H.POMEGRANATE</b>			
<b>HC &amp; RI (W), Trichy</b>			
<b>12.</b>	<b>HCRI/TRY/FRU/POM/2014/001</b> Screening and evaluation of Pomegranate ( <i>Punica granatum</i> ) accessions against sodicity tolerance under field conditions July, 2014 – June, 2018	Dr. V.P.Sanathi	The project may be closed and completion report may be sent.
<b>I. JAMUN</b>			
<b>Department of Horticulture, AC&amp;RI, Killikulam</b>			
<b>13.</b>	<b>HCRI/KKM/HORT/FRU/2015/001</b> Collection and evaluation of jamun ( <i>Eugenia jambolana</i> L.) varieties and eco types for higher yield and quality Period: June, 2015 –May,2020	Dr. M. I. Manivannan	The project may be closed and completion report may be sent.
<b>J.STRAWBERRY</b>			
<b>HRS, Ooty</b>			
<b>14.</b>	<b>HCRI/OTY/HOR/FRU/2018/001</b> Collection and evaluation of strawberry varieties suitable for Nilgiris Period: June,2017 – Aug,2019	Dr. S. Karthikeyan	The project may be continued.
<b>K.MANILA TAMARIND</b>			
<b>Dept. of Fruit Science, HC&amp;RI, Periyakulam</b>			
<b>15.</b>	<b>HCRI/PKM/HOR/FRU/2018/001</b> Survey, collection and evaluation of manila tamarind accessions Period: Oct, 2018 – Sep, 2021	Dr. K. Sankaranarayanan	The proposal for change of project leader may be submitted and the project may be continued.
<b>L. AVOCADO</b>			
<b>HRS, Thadiyankudisai</b>			



<b>16.</b>	<b>HCTI/TKD/HOR/FRU/2019/002</b> Evaluation of avocado genotypes for yield and quality under lower Pulney hills Period: Jan, 2019 – Dec, 2021	Dr. K. Sundaraiya	The project may be continued. Collections from Vandiperiyar region to be included.
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## II. CROP MANAGEMENT

S.No.	Project Number, Title and Period	Investigator	Remarks
<b>A.MANGO</b>			
<b>RRS, Paiyur</b>			
1.	<b>HCRI/PAI/HOR/FRU/2018/001</b> Studies on the yield and quality attributes in the paclobutrazol treated field of main and off season mango cv. Bangalora yield and quality Period: Aug,2018 – Dec,2021	Dr. S. Srividhya	The project may be continued.
2.	<b>HCRI/PAI/HOR/FRU/2018/002</b> Studies on the screening of mango polyembryonic rootstocks against drought stress. Period: Aug,2018 – Dec,2021	Dr. S. Srividhya	The deletion proposal may be submitted.
3.	<b>HCRI/PAI/HOR/FRU/2019/001</b> Studies on the production of quality rootstock in selected varieties of mango Period: Jan,2019 – Dec, 2021	Dr. L. Jeevajothi	The project may be closed and new project may be proposed for evaluation of pickle type mango varieties.
<b>B.BANANA</b>			
<b>Department of Plant Breeding &amp; Genetics, AC &amp; RI, Killikulam</b>			
4.	<b>CPMB/KKM/BIT/FRU/2017/001</b> Micropropagation protocol development for banana cultivars viz., Matti, Ney Poovan and Monthan Period: Feb, 2017 – Jan,2020	Dr. S. Merina Prem Kumari	The project may be continued.
<b>C.GUAVA</b>			
<b>Department of Fruit Crops, HC &amp; RI, Coimbatore</b>			
5.	<b>HCRI/CBE/HOR/FRU/2013/004</b> High density planting and canopy management in guava cv. Lucknow 49 Period: June,2013 – May,2019	Dr. M. Kavino	The project may be closed and completion report may be submitted.
<b>HC &amp; RI (W), Trichy</b>			
6.	<b>HCRI/TRY/FRU/GUA/2014/003</b> Standardization of fertigation schedule in High density planting of Guava cv. L – 49 under alkaline soil Period: June, 2014 – May,2020	Dr. J. Auxilia	The project may be closed and completion report may be submitted.

S.No.	Project Number, Title and Period	Investigator	Remarks
<b>D. CITRUS</b>			
<b>Citrus Research Station, Sankarankovil</b>			
7.	<b>HCRI/ SKL/HOR/ CIT/ 2016/001</b> Effect of organic manures on growth and yield of acid lime in Tirunelveli District Period: Jan, 2016 – Dec,2019	Dr. S. Muthulakshmi	The project may be closed and completion report may be sent.
8.	<b>HCRI/SAN/HOR/FRU/2017/002</b> Studies on effect of micronutrients on yield and quality of acid lime ( <i>Citrus aurantifolia</i> Swingle). Period: June 2017 to May 2020	Dr. P. Nainar	The project may be continued as per the objectives.
<b>E.SAPOTA</b>			
<b>Post Harvest Technology Centre, TNAU, Coimbatore</b>			
9.	<b>HCRI/CBE/HOR/FRU/2016/001</b> Developing a process for uniform ripening and enhancing the shelf life and quality of Sapota ( <i>Manilkara achras</i> ) Period: Aug,2016 – July,2019	Dr. K. Venkatesan	The project may be closed and completion report may be sent.
<b>F.PEAR</b>			
<b>HRS, Kodaikanal</b>			
10.	<b>HCRI/KDL/HOR/FRU/2017/001</b> Standardization of high density planting for higher productivity and quality in pear Period: Dec,2017 – Nov,2021	Dr. T. Saraswathi	The proposal for change of project leader to be submitted  The project may be continued as per the objectives.

### C. LIST OF CULTURES UNDER MLT / ART

S. No.	Crop	Name of the culture / Hybrid	MLT / ART	Centre
<b>Fruit Science</b>				
1.	Banana	H 212	MLT (ART I)	HC&RI, Coimbatore
2.	Banana	H 96 / 7	MLT	HC&RI, Coimbatore
3.	Banana	NPH 02-01	Sucker multiplication for MLT is in progress	HC&RI, Coimbatore
4.	Banana	H 531		HC&RI, Coimbatore

## D. ACTION PLAN FOR 2019-2020

### A. CROP IMPROVEMENT

<b>Crop: Mango</b>				
<b>Theme No. and Title</b>		<b>Theme No 1: Identification of traditional mango genotypes of Tamil Nadu for future breeding programme</b>		
<b>Project No. &amp; Title</b>		-		
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) and Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
1.	Survey, identification, documentation and conservation of elite seedling progenies of mango genotypes for economic parameters	<p><b>Region I</b> (Northern districts of TN) Dr. L. Jeevajothi Professor (Hort.)</p> <p>Dr. S. Srividhya Asst. Prof (Hort.)</p> <p><b>RRS, Paiyur</b></p> <p><b>Region II</b> (Southern districts of TN) Dr.J.Rajangam Professor (Hort.)</p> <p>Dr.M.Kavino Asst. Prof (Hort.)</p> <p><b>HC&amp;RI, Periyakulam</b></p>	<p>Survey, identification and documentation of high yielding seedling progenies of mango genotypes with special attributes <i>viz.</i>, <b>year round fruiting</b> / regular bearing / off-season bearing / high yield and quality/ suitable for pickling purpose (vadumangai / cut mango / chutney etc.)</p> <p>Establishment and maintenance of the identified genotypes in the germplasm block</p>	Identification of high yielding traditional genotypes with superior traits

<b>Crop: Banana</b>				
<b>Theme No. &amp; Title</b>		<b>Theme No 1: Improvement of banana through hybridization</b>		
<b>Project No. &amp; Title</b>		-		
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) &amp; Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
2.	To evaluate the existing banana hybrids for yield and quality with resistance to nematodes and <i>Fusarium</i> wilt	Dr. P. Paramaguru, Professor (Hort.)  Dr. C. Kavitha Asst. Prof. (Hort.)  Dr. S. K. Manoranjitham Assoc. Prof. (Pl. Patho.)  Dr. P. Vetrivelkai Asst. Prof. (Nema.)  <b>HC&amp;RI, Coimbatore</b>	<ul style="list-style-type: none"> <li>• Multiplication of new hybrids viz., H 914 and H 916 for conduct of MLT</li> <li>• Conduct of MLT / ART for identified pre-release cultures of banana viz., H 212, H 531, H 96/7 and NPH-02-01</li> <li>• Submission of variety release proposal for H212 and multiplication of planting material for H212.</li> </ul>	<i>Fusarium</i> and nematode resistant banana hybrid(s) developed with better yield and quality attributes will be multiplied and sent for MLT/ART and subsequently for variety release.
<b>Crop: ACID LIME</b>				
<b>Theme No. and Title</b>		<b>Theme No 1: Improvement of acid lime through breeding approaches</b>		
<b>Project No. &amp; Title</b>		-		
3.	Evaluation and identification of suitable varieties for 'year round' production	Dr. P. Nainar Professor (Hort.)	Evaluation and identification of suitable varieties for 'year round' production	Identification of suitable variety with 'year round' production.
4.	Evaluation and identification of rootstocks for improvement of yield, quality and salt tolerance in acid lime	<b>CRS, Sankarankovil</b>	Collection of rootstocks from CCRI, Nagpur and other institutes working in citrus and evaluation of the collected rootstocks.	Identification of rootstocks for improvement of yield, quality and salt tolerance in acid lime

<b>Crop: Mandarin Orange</b>				
<b>Theme No. and Title :</b>		<b>ThemeNo1: Collection and enrichment of mandarin orange germplasm</b>		
<b>Project No. &amp; Title</b>		<b>HCRI/YCD/HOR/FRU/2016/001 Survey, collection and evaluation of mandarin orange varieties under Shevaroy hills</b>		
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) and Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
5.	Evaluation of mandarin orange varieties suitable for Shevaroy hills	Dr. S.Nanthakumar Professor (Hort.)  <b>HRS, Yercaud</b>	Evaluation of the existing germplasm and identification of suitable varieties for Shevaroy hills.	Identification of high yielding mandarin orange variety suitable for Shevaroy hills.
<b>Crop: GRAPES</b>				
<b>Theme No. and Title</b>		<b>Theme No1 : Improvement of grapes through breeding approaches</b>		
<b>Project No. &amp; Title</b>		<b>-</b>		
6.	a. Evaluation of grapes ( <i>Vitis vinifera</i> L. & <i>Vitis labrusca</i> L.) varieties and clones for yield, quality and suitability for table, juice and raisin making  b. Identification of budsport of Muscat Hamburg.	Dr. A. Subbiah Asst. Prof.(Hort.)  Dr.S. Saraswathy, Professor (Hort.) <b>GRS, Theni</b>	Promotion of best performing varieties / clones suitable for table, juice and raisin making purposes combined with yield and quality.	Identified best performing varieties / clones will be popularized among grape growers of Tamil Nadu

<b>Crop: PAPAYA</b>				
<b>Theme No. and Title</b>		<b>Theme No 1: Improvement of papaya through breeding approaches</b>		
<b>Project No. &amp; Title</b>		-		
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) &amp; Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
7.	Development of intergeneric hybrids with Papaya Ring Spot Virus tolerance	Dr.P.Paramaguru, Professor (Horticulture)  Dr. C. Kavitha Asst. Prof. (Hort.)  <b>HC&amp;RI, Coimbatore</b>	Evaluation of F <sub>7</sub> inter generic progenies for yield and quality along with PRSV tolerance	PRSV tolerant papaya hybrid with better yield and quality attributes
8.	Development of improved gynodioecious varieties for high yield, better quality attributes and PRSV tolerance	Dr.P.Paramaguru, Professor (Horticulture)  Dr. C. Kavitha Asst. Prof. (Hort.)  <b>HC&amp;RI, Coimbatore</b>	Evaluation and purification of already identified gynodioecious selection (CI-33) in F <sub>6</sub> generation and forwarding to MLT.	Improved gynodioecious papaya selections with better yield, fruit quality and PRSV tolerance.
<b>Crop: GUAVA</b>				
<b>Theme No. and Title</b>		<b>Theme No 1: Improvement of guava through breeding approaches</b>		
<b>Project No. &amp; Title</b>		<b>HCRI/CBE/HOR/ FRU/2013/003 Improvement of guava (<i>Psidium guajava</i>) through selection and inter-varietal hybridization</b>		
9.	Screening of open pollinated (OP) progenies and hybrid derivatives for red pulp, less / soft seeded and yield.	Dr. D. Vidhya Asst. Prof.(Hort.) <b>HC &amp; RI, Coimbatore</b>	Quality attributes and shelf life of superior OP selection Sel.PG 1-7 from Arka Kiran is to be studied.  Multiplication of planting materials.	Improved guava hybrid / OP progeny with pink pulp and high yield for commercial exploitation.
<b>Crop: JACK FRUIT</b>				



<b>Theme No. and Title</b>		<b>Theme No 1: Collection, evaluation and identification of high yielding and quality jackfruit</b>		
<b>Project No. &amp; Title</b>		-		
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) and Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
10.	Evaluation of identified jackfruit genotypes suitable for small family and urban markets	Dr. K. Nageswari Professor (Hort.) <b>VRS, Palur</b>  Dr.Subesh Ranjithkumar Asst.Prof. (Hort.), Dr.J.Rajangam Professor (Hort.) <b>HC &amp; RI, Periyakulam</b>	Identified gumless and small to medium sized jackfruit genotypes will be evaluated further for yield and quality attributes  Genotypes identified at AC&RI, Kudumiyamalai to be added into the existing collection	Identification of high yielding jackfruit genotype with good quality attributes
<b>Theme No. and Title</b>		<b>Theme No 2 : Multiplication and evaluation of identified promising jackfruit genotypes in Pudukkottai</b>		
<b>Project No. &amp; Title</b>		-		
11.	Multiplication, planting and evaluation of high yielding good quality promising jackfruit genotypes	Dr. R.Jayavalli, Asst. Prof. (Hort.), <b>AC&amp;RI, Kudumiyamalai</b>	<ul style="list-style-type: none"> <li>• Grouping of genotypes based on yield and fruit quality traits</li> <li>• Evaluation under each group for superiority in yield and fruit quality and identification of promising genotypes</li> <li>• Multiplication of promising genotypes through soft wood grafting</li> <li>• Close planting of promising genotypes at AC&amp;RI, Kudumiyamalai.</li> <li>• Supply of the planting materials to HC &amp; RI, Periyakulam and VRS, Palur.</li> </ul>	Identification of promising jack fruit genotype(s) with promising yield and quality attributes

<b>Crop: WOOD APPLE</b>				
<b>Theme No. and Title :</b>		<b>Theme 1: Identification of wood apple genotypes for high yield and quality</b>		
<b>Project No.&amp; Title</b>		-		
12.	Exploration, conservation and evaluation of wood apple genotypes	Dr.K.R..Rajadurai Assoc. Prof. (Hort.) <b>RRS, Aruppukotai</b>	The available genotypes will be evaluated for identifying a promising culture	Identification of wood apple genotype for commercial exploitation
<b>Crop: Bael</b>				
<b>Theme No. and Title :</b>		<b>Theme 1: Identification of bael genotypes for high yield and quality</b>		
<b>Project No.&amp; Title</b>		-		
13.	Exploration, conservation and evaluation of bael genotypes	Dr. K. R. Rajadurai Assoc. Prof. (Hort.) <b>RRS, Aruppukotai</b>	Accessions will be collected and evaluated along with available accessions for identifying a promising genotype	Identification of suitable bael genotypes for commercial cultivation
<b>Crop: AVOCADO</b>				
<b>Theme No. and Title :</b>		<b>Theme No 1: Collection and enrichment of avocado genotypes</b>		
<b>Project No. &amp; Title</b>		<b>HCRI/TKD/HOR/FRU/2019/002 Evaluation of Avocado (<i>Persia americana</i> M.) genotypes for yield and quality in the lower Pulney hills</b>		
<b>S. No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) and Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
14.	Collection and evaluation of avocado genotypes suitable for lower Pulney hills	Dr. K. Sundharaiya Asst. Prof.(Hort.) <b>HRS, Thadiyankudisai</b>	Survey on avocado genotypes in Vandiperiyar, Kerala region and enrich the existing germplasm and evaluation	Identification of best performing genotypes based on yield and quality parameters will be done

<b>Crop: Litchi</b>				
<b>Theme No. and Title :</b>		<b>Theme 1: Collection and evaluation of litchi genotypes / varieties suitable for lower Pulney hills for high yield and quality</b>		
<b>Project No. &amp; Title</b>		-		
15.	Collection and evaluation of litchi genotypes / varieties for lower Pulney hills	Dr.T.Thangaselvbai Professor (Hort.)  Dr. K. Sundharaiya Asst. Prof. (Hort.) <b>HRS, Thadiyankudisai</b>	Collection of litchi genotypes / varieties and evaluation	Identification of promising genotypes / varieties for commercial exploitation under lower Pulney hills and popularization will be done
<b>Crop: Strawberry</b>				
<b>Theme No. and Title :</b>		<b>Theme No 1: Collection and enrichment of strawberry genotypes</b>		
<b>Project No. &amp; Title</b>		<b>HCRI/OTY/HOR/FRU/2018/001 Collection and evaluation of strawberry varieties suitable for Nilgiris</b>		
16.	Collection and evaluation of genotypes suitable for the Nilgiris	Dr. S. Karthikeyan Asst. Prof.(Hort.)  <b>HRS, Ooty</b>	Evaluation of the genotypes in the existing strawberry germplasm	Identification of best performing genotypes based on yield and quality parameters
<b>Crop: Kiwifruit</b>				
<b>Theme No. and Title :</b>		<b>Theme No 1: Collection and enrichment of kiwifruit varieties</b>		
<b>Project No. &amp; Title</b>		-		
17.	Evaluation of genotypes suitable for lower Pulney hills	Dr. I. Muthuvel Assoc. Prof.(Hort.)  <b>HRS, Kodaikanal</b>	Evaluation of kiwifruit varieties already collected	Identification of best performing genotypes based on yield and quality parameters

## B. CROP MANAGEMENT

<b>Crop: MANGO</b>				
<b>Theme No. and Title : Optimizing the factors responsible for increasing the production</b>				
<b>S. No</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) and Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
1.	Evaluation of mango varieties under HDP	Dr. D. Vidhya Asst. Prof. (Hort.)  Dr. M.S. Aneesharani Prof. (Hort.) <b>HC &amp; RI, Coimbatore</b>	Initiation of the trial	Identification of mango variety suitable for HDP
2.	Climate resilient management techniques in mango	Dr. L. Jeevajothe Dr. S. Srividhya <b>RRS, Paiyur</b>	- Screening of rootstocks for salinity tolerance - Techniques for yield improvement in rainfed situation	Management strategies for climate resilience will be identified for mango cultivation
<b>Crop: GUAVA</b>				
<b>Theme No. and Title :</b>		<b>Canopy management and fertigation schedule in HDP &amp; UHDP in guava</b>		
<b>Project No. &amp; Title</b>		<b>HCRI/TRY/HOR/FRU/2014/003 Standardization of fertigation schedule in high density planting of guava cv. L – 49 under alkaline soil</b>		
<b>S. No.</b>	<b>Theme Activity</b>	<b>Name of the Scientist(s) and Centre</b>	<b>ACTION PLAN (2019-2020)</b>	<b>Deliverables</b>
3.	Standardization of fertigation schedule for HDP in guava cv. Lucknow-49 under alkaline soil	Dr. J. Auxilia Assoc. Prof. (Hort.)  <b>HC&amp;RI(W), Trichy</b>	Assessment of physio-chemical properties of soil under HDP guava cv. Lucknow-49	Technology of fertigation for HDP in guava cv.L.49 under sodic-alkaline soil conditions.

<b>Acidlime</b>				
<b>Theme No. and Title :</b>		<b>Strategies to improve productivity in citrus</b>		
<b>Project No. &amp; Title</b>				
4.	Management of citrus greening	Dr. P. Nainar Professor (Hort.)  <b>CRS, Sankarankovil</b> in Co-ordination with pathologist at AC & RI, Killikulam	Evaluation of strategies for citrus greening management	Identification of effective package for management of citrus greening
<b>Pear</b>				
<b>Theme No. and Title :</b>		<b>Optimizing the factors responsible for increasing the production</b>		
<b>Project No. &amp; Title</b>				
5.	Evaluation of different pear varieties under HDP	Dr. I. Muthuvel Assoc. Prof. (Hort.)  Dr. M. I. Manivannan Asst. Prof. (Hort.)  <b>HRS, Kodaikanal</b>	Planting of already collected pear varieties may be initiated.	Standardization of HDP for pear cultivation under lower pulney hills.

## II. Vegetable Science

### A. Recommendations

- Development of varieties akin to mundu type chillies. The Purification of already collected Mundu type chilli genotypes should be done at the Dept.of Vegetable Science, Periyakulam and VRS, Palur. Evaluation may be taken up at Ramnad (Professor & Head, Department of vegetable Science, TNAU, Coimbatore / Periyakulam and Professor & Head,VRS, Palur)
- Due to high temperature as a result of climate change pollen sterility is induced. Studies may be taken up to mitigate the above issue. (Professor & Head, Department of vegetable crops, TNAU, Coimbatore and Dept. of Crop Physiology, TNAU)
- Weed management technologies for vegetable production has to be standardized (Professor & Head, Department of vegetable Science, TNAU, Coimbatore and Professor & Head, Dept. of Agronomy, TNAU, Coimbatore)
- Focus should be given on the development of climate resilient and multiple resistant varieties in vegetables (Professor & Head, Department of vegetable Science, TNAU, Coimbatore; Professor & Head, Department of vegetable science, Periyakulam; Professor & Head, Department of vegetable Science, HC &RI (W), Trichy and Professor & Head, VRS, Palur)
- Location specific varieties / hybrids have to be developed in brinjal [Purple round-Manaparai Local Brinjal,HC &RI (W), Trichy; Purple round-Gnamedu Local Brinjal, VRS Palur; Patchai vari Brinjal-Dindigul Kottampatti local, HC&RI, Periyakulam and Bhavani local, HC &RI, Coimbatore)
- Identification of salt tolerant genotypes in Cassava have to be taken up (Professor & Head, TCRS, Yethapur)
- Crop specific multi-nutrient fertilizers have to be developed for cucurbitaceous vegetables (Professor & Head, Dept. of Vegetable Science, HC&RI, Coimbatore and Professor & Head, Dept. of SS&AC, Coimbatore)
- Organic Packages have to be developed for high value vegetable crops (Professor & Head, HRS, Ooty)

**B. Remarks on ongoing university research sub projects**

**Crop Improvement**

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
<b>I. CROP IMPROVEMENT</b>			
<b>I</b>	<b>BRINJAL</b>		
1.	CPBG/PAL/PBG/VEG/2018/001, Development of brinjal hybrids with high yield and nematode resistance. Period: <b>March 2017 to February 2022</b>	Dr. K. Sakthivel Asst. Prof. (PBG) Dr. I. Cannayane Asst. Prof. (Nematology) Dr. L. JeevaJothi Professor (Hort.) and Head VRS, Palur	<ul style="list-style-type: none"> <li>• The project may be deleted.</li> <li>• Enrich the brinjal accessions and maintain the germplasm collection.</li> </ul>
2.	HCRI/HOR/VEG/2014/001, Evolution and evaluation of high yielding non-spiny brinjal types with the quality characters of spiny Brinjal. Period: <b>November 2014 to October 2017</b>	Dr. S.Nanthakumar Professor and Head, HRS, Yercaud	<ul style="list-style-type: none"> <li>• Consumer preference should be assessed in Vellore and nearby three districts</li> <li>• ART should be restricted to that specific locations.</li> </ul>
3.	HCRI/TRY/HOR/VEG/BRI/2015/001, Collection, screening and breeding of brinjal under salt affected soils. Period: <b>April 2015 to March 2019</b>	Dr. V. Lakshmanan, Professor and Head Department of Vegetable Crops,HC&RI (W), Trichy	<ul style="list-style-type: none"> <li>• The project may be closed.</li> </ul>
4.	<b>HCRI/MDU/HOR/VEG/2018/001:</b> Collection, conservation and evaluation of <i>Solanum torvum</i> Swartz. genotypes for high alkaloid and less antinutritional content. Period: <b>April 2018 to March 2021</b>	Dr.A.Beulah Associate Professor (Hort.) Dept. of Horticulture Mrs.A.Kavitha Pushpam Asst. Prof. (Bio.chem) Dept. of Biotechnology AC & RI, Madurai	<ul style="list-style-type: none"> <li>• The project may be closed.</li> </ul>
<b>II.</b>	<b>CHILLI</b>		
5.	HCRI/CBE/HOR/VEG/2016/002 Screening of chilli germplasm for yield, quality and tolerance to Leaf Curl Virus. Period: <b>December 2016 to November 2019</b>	Dr.H.Usha Nandhini devi Asst. Prof. (Hort.)	<ul style="list-style-type: none"> <li>• The accessions in the germplasm should be purified. After attaining homozygosity crossing</li> </ul>

			may be initiated.
<b>III.</b>	<b>BHENDI</b>		
6.	HCRI/CBE/HOR/VEG/2019/001 Development of high yield F <sub>1</sub> hybrids with yellow vein mosaic virus (YVMV) and enation leaf curl virus resistance (ELCV) in bhendi <b>January 2019 – August 2024</b>	Dr.K.Shoba Thingalmaniyan, Asst. Prof. (Hort.), Dept. of Veg. Crops, HC & RI, TNAU, Coimbatore	<ul style="list-style-type: none"> <li>The collected accessions may be screened for YVMV and ELCV.</li> </ul>
<b>IV</b>	<b>BOTTLE GOURD</b>		
7.	CPBG/PAL/PBG/VEG/2015/004, Development of bottle gourd hybrids with small to medium sized cylindrical fruits suitable for local and export markets. Period: <b>October 2015 to September 2019</b>	Dr. K. Sakthivel, Asst. Prof. (PBG) VRS, Palur	<ul style="list-style-type: none"> <li>The project may be closed.</li> <li>The genotypes may be purified and maintained.</li> </ul>
<b>V</b>	<b>RIDGE GOURD</b>		
8.	HCRI/CBE/HOR/VEG/2014/003, Development of RIL's (Recombinant Inbred Lines) of cluster bearing, small fruited hermaphrodite ridge gourd [ <i>Luffa acutangula</i> (Roxb.)L], Period: <b>December 2014 to April 2019</b>	Dr. V.Rajashree, Asst. Prof. (Hort.) Dept. of Vegetable Crops, HC&RI, TNAU, Coimbatore	<ul style="list-style-type: none"> <li>Completion report should be submitted.</li> </ul>
9.	HCRI/MDU/HOR/VEG/2016/001, Developing F <sub>1</sub> hybrid in Ridge gourd with high yield and quality. Period: <b>Sep 2016 – Aug 2019</b>	Dr. V. Krishnamoorthy Asst. Professor (Hort). AC&RI, Madurai	<ul style="list-style-type: none"> <li>Heterosis should be studied.</li> <li>The source for viral resistance may be identified and included in hybridization programme.</li> </ul>
<b>VI</b>	<b>BITTER GOURD</b>		
10.	HCRI/PKM/HOR/VEG/2017/00, Development of F <sub>1</sub> hybrids in bitter gourd for better yield and quality. Period: <b>October. 2017 to September 2020</b>	Dr. R. Balakumbahan, Asst. Prof. (Horticulture) Dept. of Veg. Crops Dr. J. Sheela, Prof. (Plant Pathology) Dept. of Veg. Crops	<ul style="list-style-type: none"> <li>MDU-1 bitter gourd may be included.</li> <li>The virus resistance should be assessed before selecting parents for crossing.</li> </ul>
<b>VII</b>	<b>CUCUMBER</b>		
11.	HC&RI/KKM/HOR/VEG/2015/001 Survey, Collection and Evaluation of salad cucumbers ( <i>Cucumis sativus</i> L.) Period: <b>December 2015 to November 2018</b>	Dr.M.I.Manivannan Assistant Professor(Horticulture)	<ul style="list-style-type: none"> <li>The project may be closed.</li> <li>The genotypes may be maintained.</li> </ul>



<b>VIII</b>	<b>CASSAVA</b>		
12.	<b>HCRI/YTP/HOR/TAP/2017/001</b> Evaluation of suitable cassava variety for rainfed ecosystem in hilly areas of Tamil Nadu. Period: <b>August 2017 to August 2020</b>	Dr.P.S. Kavitha, Asst. Prof.(Hort.) TCRS, Yethapur	<ul style="list-style-type: none"> <li>• Drought tolerance parameters have to be assessed.</li> <li>• Starch content should be compared with H 165</li> </ul>
13.	Evaluation of cassava genotypes for salt tolerance <b>Nov 2017 –Dec 2019</b>	Dr. M. K. Kalarani Professor (Crop Physiology)	<ul style="list-style-type: none"> <li>• Salt level in the soil have to assessed from planting to harvest.</li> <li>• Project may be continued for one more year.</li> </ul>
<b>IX</b>	<b>AMARANTHUS</b>		
14.	<b>HCRI/TRY/HOR/VEG/2016/001,</b> Evaluation of underutilized leafy vegetables in salt affected soils for leaf yield and phytoremediation effect. Period: <b>January 2016 to March 2019</b>	S.Jeeva Professor (Hort.) HC&RI (W), Trichy.	<ul style="list-style-type: none"> <li>• The project may be closed.</li> </ul>
<b>X</b>	<b>GARLIC</b>		
15.	HC&RI/KDL/HOR/VEG/2017/001. Performance evaluation of garlic genotypes grown in open field and poly house condition for yield and quality Period: <b>Nov 2016 – Oct 2019</b>	Dr.T.Saraswathy Professor (Hort.) Dept. of Veg Crops	<ul style="list-style-type: none"> <li>• The project may be closed.</li> </ul>

## II. CROP MANAGEMENT

<b>S. No.</b>	<b>Project Number, Title and Period</b>	<b>Project Investigator and Centre</b>	<b>Remarks</b>
<b>I</b>	<b>BRINJAL</b>		
1.	HCRI/PLR/SST/VEG/2018/001 – Studies on effect of seed coating formulation for root traits and its influence on seed yield of Brinjal var. PLR (Br) 2 under varied fertilizer levels. Period: <b>August, 2018 – July, 2020</b>	V. Paramasivam Professor(SST) Vegetable Research Station, Palur	<ul style="list-style-type: none"> <li>• Deletion proposal may be sent.</li> </ul>

<b>II.</b>	<b>SNAKE GOURD</b>		
2.	SEED / PLR / SST / VEG / 2017 / 001 Standardization of seed extraction techniques for snakegourd ( <i>Trichosanthes cucumerina</i> L) and bottlegourd ( <i>Lagenaria siceraria</i> Mol.) Period: <b>January, 2017 to December, 2018</b>	V. Paramasivam Professor(SST) Vegetable Research Station, Palur	<ul style="list-style-type: none"> <li>The project may be closed and completion report may be sent.</li> </ul>
<b>III.</b>	<b>CUCUMBER</b>		
3.	HCRI/CBE/HOR/VEG/2018/001 Studies on the effect of fertigation in cucumber under polyhouse condition. Period: <b>2018– 2020</b>	Dr. G.V. Rajalingam Dept. of Veg Crops HC&RI, TNAU, Coimbatore	<ul style="list-style-type: none"> <li>The project may be closed with the available data.</li> </ul>
<b>IV.</b>	<b>ONION</b>		
5.	HC&RI/KKM/HOR/VEG/2015/002 Studies on influence of growth retardants in increasing yield and quality in bellary onion ( <i>Alium cepa</i> var. <i>cepa</i> ). Period : <b>December 2015 to November 2018</b>	Dr.M.I.Manivannan Assistant Professor(Horticulture)	<ul style="list-style-type: none"> <li>Mid-term correction have to be carried out to alter the time of spray and shelf life should be studied</li> <li>The results should be compared with NHRDF recommendations. Accordingly the project should be revised and continued.</li> </ul>
<b>V.</b>	<b>CASSAVA</b>		
6.	NRM / YTP / SAC / TAP / 2017 / 001 Evaluation of new micronutrient fertilizer mixture for increasing the productivity and starch content in cassava. Period: <b>March 2017 to February 2019</b>	Dr. S. Suganya, Asst. Prof. (SS&AC) Dr. D. Jegadeeswari, Asst. Prof. (SS&AC), TCRS, Yethapur.	<ul style="list-style-type: none"> <li>Recommended for OFT.</li> <li>OFT have to be done by Horticulturist and Physiologist.</li> </ul>

#### LIST OF AICRP PROJECTS

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
1	AICRP/HOR/VEG/008(05 D 32 AH) ICAR-All India Coordinated Research project on vegetable Science	Dr.V.Rajasree, Ph.D., Assistant Professor(Hort.)	To be continued

	AICRP /VC//HOR/PKM/VEG/001 Performance evaluation of vegetables including drumstick	Dr. P. Paramaguru, Prof. (Hort.) Dr.V.A.Sathiyamoorthy Assistant Professor(Hort.)	To be continued
2.	AICRP/HOR/CBE/VEG/009 All India Co-ordinated Research Project on Tuber Crops (D 32 AG)	Dr.K.Kamal Kumaran, AP (Hort.)	To be continued
3.	ICAR-AINP/HOR/CBE/VEG/001 All India Network Research Project On Onion and Garlic No. DR/P2/ICAR/AINP on Onion& Garlic/ ASO/ VEG/2018 dt.24.08.2018	Dr.R. Swarna Priya Professor & Head	To be continued
4.	AICRP/NRM/CBE/SAC/004 Amelioration of micro and secondary nutrients deficiency in crops for enhancing nutrient use efficiency: Optimization of rate of copper doses for improving onion yield	Dr. T.Chitdeshwari, Professor (SS&AC), Dept. of Soil Science & Agrl. Chemistry	To be continued
5.	AICRP/NRM/CBE/SAC/004 All India Coordinated Project on Micro and Secondary nutrients and polluted elements in soils and plants: Optimizing the zinc requirement of garlic	Dr. T.Chitdeshwari, Professor (SS&AC), Dept. of Soil Science & Agrl. Chemistry	To be continued

## LIST OF EXTERNALLY FUNDED PROJECTS

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
1	DBT/ CPMB/ CBE/ DPB/ 2017/ R027 Development of tospovirus resistant transgenic tomato plants expressing an anti-viral protein gene from <i>Bougainvillea spectabilis</i>	<b>PI</b> <b>Dr. B. Rajagopal</b> Assistant Professor Department of Fruit Crops, HC&RI, TNAU, Periyakulam <b>CO-PI</b> Dr. P. Renuka Devi, Associate Professor, Dept. of Sericulture, FC&RI, Mettupalayam	The project may be continued
2.	DST/HCRI/CBE/VEG/2018/R003 Exploitation of hybrid vigour for quality and yield improvement through marker assisted selection in cucumber ( <i>Cucumis sativus</i> L.)	<b>PI</b> <b>Dr. S. Praneetha,</b> Professor (Hort.), HRS, Yercaud <b>CO-PI</b> 1. Dr.V.Rajasree, Associate Professor (Hort.), Dept. of Vegetable crops, HC & RI, TNAU, Coimbatore-3. 2. Dr. N. Manikanda Boopathi, Assistant Professor (Biotechnology),Periyakulam	The project may be continued
3.	BRNS/HCRI/MDU/HOR/2017/R001 Isolation of short statured early maturing mutants in cluster bean ( <i>Cyamopsis tetragonaloba</i> L.) through gamma irradiation	<b>PI</b> <b>Dr. P. Balasubramanian</b> Assistant Professor (Horticulture) Krishi Vigyan Kendra Ramanathapuram <b>CO-PI</b> Dr. C. Vanniarajan Professor and Head Department of Plant Breeding and Genetics AC & RI, TNAU, Madurai	Stability of the mutant may be ascertained.

## LIST OF CORE PROJECTS

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
1	<b>HCRI/PKM/HOR/VEG/2018/CP033</b> Development of F <sub>1</sub> hybrids in tomato with green shoulder, high keeping quality and resistant to TLCV	<b>Dr. V. A. Sathiyamurthy,</b> Associate Professor (Hort.) <b>Dr. J. Sheela,</b> Prof. (Plant Path)	To be continued
2.	<b>HCRI/CBE/VEG/2018/CP079.</b> Performance assessment of climate resilient F <sub>1</sub> hybrids in chilli ( <i>Capsicum annuum</i> L.) for drought tolerance and yield	<b>Dr.H.Usha Nandhini Devi</b> Asst.Prof.(Hort.), Dept.of Vegetable Crops	To be continued
3.	<b>HCRI/TRY/HOR/VEG/2018/CP030</b> Collection, evaluation and screening of small fruited bitter gourd, <i>Momordica charantia</i> L. var. <i>muricata</i> (Willd.) Chakrav. (Mithipakal) for high yield and anti-diabetic compounds under salt affected soil	<b>1.Dr. R. Neelavathi</b> Assistant Professor (Horticulture) Dept. of Floriculture and Landscape Architecture <b>2. Dr. V. Lakshmanan</b> Professor and Head Dept. of Vegetable Crops	To be continued
4.	<b>AECRI/ CBE/ PHT/ EFF/ 2018/ CP14.</b> Shelf life enhancement in Bhendi, Brinjal, Tomato and Currey leaf through postharvest application of Enhanced freshness formulation (EFF)	<b>Dr. V. Premalakshmi,</b> Assistant Professor (Horticulture) <b>Dr. M. Balakrishnan,</b> Associate Professor (F&APE), Centre for Post Harvest Technology, AEC & RI, TNAU, Coimbatore <b>Dr.K.S.Subramanian,</b> Director of Research	To be continued
5.	<b>SEC/PKM/SST/VEG/2018/CP156.</b> Effect of different growing conditions, pinching and chemical spray on seed yield and quality of annual moringa PKM 1	<b>Dr. P.Geetharani</b> Professor (SS&T) <b>Dr. N. Manikanda Boopathi</b> Assoc. Professor (Bio tech) Dept. of Biotechnology, Coimbatore	To be continued
6.	<b>NRM/CBE/SAC/VEG/2018/CP013</b> Developing and testing organically chelated micronutrient formulations for fertigation in vegetables on calcareous soils	<b>Dr.T.Chitdeshwari</b> Professor (SS&AC)	To be continued

## **C. Varieties / hybrids proposed for ART/MLT/FLD during 2019**

### **1. Onion Aca 15 (OFT)**

The Aca 15, is a selection from Puttarasal type and recorded the highest bulb yield of 22.84 t /ha which is 22.32 % increased yield over the check CO (On) 5. The bulbs of Aca 15 are bold and pink colored with 18.04 ° brix TSS. The duration of the crop is 65-70 days for bulb crop and 90 days for seed to bulb crop. Seed yield is 300 kg/ha. Seed material of Aca 15 and check variety CO (On) 5 had completed MLT/ART of Tamil Nadu and at present OFT at KVK Perambalur, KVK Ariyalur, KVK Karur, KVK Dindigul, KVK Tirupur, KVK Salem, KVK Trichy, KVK Cuddalore, Theni, Coimbatore **(Source: ANPROG /HOR/ CBE /VEG /001)**.

### **2. Tomato CTH 1 (OFT)**

It is a F<sub>1</sub> hybrid of LE 127 x LE 239. Fruits are flat round with green shoulder each fruit weighs about 75.3 g. The plant yields 32.1 fruits with mean fruit weight of 75.0 g. The yield potential of the hybrid was 96.0 t/ha which is 22.6 % increase over COTH 3 (78.3 t/ha) & 26.3 % increase over Lakshmi (76.0t/ha). It is moderately resistant to leaf curl (10.5 PDI). The TSS of the fruit is 6.30° brix and the ascorbic acid content is 30.43 mg/100 g and the shelf life extend up to 40 days at the storage temperature of 8°C. Seeds of CTH 1 along with check hybrids COTH 3 and Lakshmi had completed MLT/ART of Tamil Nadu and at present on OFT at RRS Paiyur, HC&RI PKM, Nachipalayam-Coimbatore, Sattakalpudhur Coimbatore, KVK Sandhiyur and KVK Papparapatti.

**(Source : AICRP/HOR/CBE/VEG/008)**

### **3. Brinjal hybrid derivative (HD 10-6-5-3) (ART)**

Brinjal hybrid derivative (HD 10-6-5-3) was selected from a cross Singampunari Local x Annamalai. This hybrid derivative is with a plant height of 85.16 cm with 22.17 branches/plant. Each plant bear 39.14 fruits and each weighing 47.50g. The fruit is white in colour with purple stripes which is locally called as Palgiri. The hybrid derivative showed 18.59 % and 36.64 % infestation by shoot and fruit borer respectively besides recording 18.45 % little leaf incidence and the yield increase over the check (CO2) was 30.4%.The culture is under ART .**(Source: ACMD /MDU/HOR /10/002)**.

#### **4. Non-spiny brinjal VMB-16-10(ART)**

The non-spiny brinjal (VMB-16-10) is the hybrid derivative. The plant height is 118.6 cm with 30.5 branches/plant. Each plant bear 95.5 fruits each weighing 120 g. The fruit is purple in colour with a potential yield of 2.3 kg /plant. The hybrid derivative showed 18.3 % and 23.3 % infestation by shoot and fruit borer respectively besides recording no little leaf incidence. The yield increase over the check (VRM(Br1)) was 25%. The culture is under ART **(Source:HCRI/VIJ/HOR/VEG/2014/001).**

#### **5. Cassava Me 681 (ART)**

It is a selection from Thondamuthoor -1. Plants are erect, tall growing and branching at the top. The inter nodal length is shorter and the leaf size is bigger with sufficient canopy. The tubers are long, cylindrical with pinkish white skin. The rind colour is also pink with creamy white. The flesh is white in colour. The mean tuber yield per plant is 6.28 kg with the starch content of 29.62% It is a dual purpose cassava accession suitable for edible purpose and for industrial use. Cassava mosaic virus grade is one to two. Harvesting can be done at 10 months. **(Source: AICRP /HOR /CBE /VEG/009).**

#### **6. Pumpkin Hybrid CPH1 (MLT I)**

It is a F<sub>1</sub> hybrid between Saras x Pusa Vishwas. Plants are medium viny. Fruits are small (1.0-1.5kg) and suitable nuclear families. The flat shape of the fruit is amenable for packing. The fruits are very rich in β carotene (89.6µg/g) with thick flesh (3.8cm). The flesh is deep orange with excellent cooking quality. The crop duration is 140-150 days with an average yield of 32-35t/ha.

### **Crop Management**

#### **1. Cassava Tonic**

**Cassava Tonic is the mixture of fermented organic manures and inorganic nutrients along with biocontrol agent.**

#### **Technology**

100 kg cowdung mixed in 200 lit water and filtered. Added 2.5kg of *Pseudomonas fluorescence* and 2.5 kg neem cake and kept for fermentation. In the fermented solution, added 0.5 % sulphate of potash, 0.9 % multi K (KNO<sub>3</sub>), 0.5 % MgSO<sub>4</sub>, 0.25 % ZnSO<sub>4</sub> and 0.5 % FeSO<sub>4</sub> and mixed well and made up to 500 lit with water and sprayed four times from one month after planting at 21 days interval.

#### **Benefits**

Cassava tonic is better in increasing 25-30 percent yield and 3 per cent starch content over control with grade 2 CMD incidence ( 1-10 %) and 3.5 BC ratio was witnessed by fellow farmers, NABARD AGMs, Chairman, Vice chairman and members of Tamil Nadu Sago and Starch Manufacturers Association (TNSSMA) and their feedback was highly encouraging and positive.

## D. ACTION PLAN

### a. Crop Improvement

<b>Theme No. 1: Development of climate resilient varieties in Vegetable Crops</b>						
<b>Development of climate resilient varieties in Chilli</b>						
<b>Sub theme 1: Development of variety akin to Mundu type of Ramnad</b>						
<b>No</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Characterization of chilli germplasm for yield, quality (capsaicin and ascorbic acid) and drought tolerance	Dept. of Vegetable Science, HC&RI, Coimbatore / Periyakulam  VRS, Palur	Pooling of genetic resources and screening	Characterization and performance assessment of collected genotypes	Confirmation trial	Identification of climate resilient genotypes

<b>Theme No. 1: Development of climate resilient varieties in Vegetable Crops</b>						
<b>Development of climate resilient varieties in Chilli</b>						
<b>Sub theme 2: Development of high yielding and drought tolerant hybrids in Chilli</b>						
<b>No</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Characterization and field screening of chilli germplasm for drought tolerance	Dept. of Veg Crops, HC&RI, Coimbatore	<b>Performance assessment of four F<sub>1</sub> hybrids</b> ➤ K1 x Virudhunagar Local ➤ Guntur Local x Aladippatti Local ➤ Thoppudapatti Local x G no.5 ➤ KKM 1 x Virudhunagar Local	Identification of superior hybrids	Performance evaluation of identified hybrid in different locations	Identification of superior hybrid with drought tolerance



<b>Theme No 2: Development of varieties with multiple resistance</b>						
<b>Development of varieties with multiple resistance in Bhendi</b>						
<b>Sub theme 1: Development of varieties with multiple resistance in Bhendi</b>						
<b>No</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Characterization and field screening of bhendi germplasm for yield, special morphological traits (slender, medium size, dark green pods and less pubescence), quality (less sliminess), YVMV and ELCV resistance	Dept. of Veg. Science, HC&RI, Coimbatore	The identified resistant genotypes <i>viz.</i> , AE 64, AE 66, AE 17, 14/4,14/5 and 14/10 will be used for developing hybrids	Development of F1 hybrids and artificial screening for YVMV and ELCV resistance	Identification of resistant hybrids and confirmatory evaluation	Identification of hybrids for high yield, YVMV and ELCV resistance

<b>Theme No 2: Development of varieties with multiple resistance</b>						
<b>Development of varieties with multiple resistance in tomato</b>						
<b>Sub theme 2: Development of F1 hybrids in tomato with resistance to TLCV</b>						
<b>No</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Evolving hybrids with resistance to TLCV in tomato	Dept. of Veg Science, HC&RI, Periyakulam	Twelve genotypes were crossed during 2018-19  The 128 hybrids developed will be evaluated	Evaluation of F1 hybrids	Confirmatory trial will be taken up	Identification of superior hybrid with high yield and TLCV resistance

<b>Theme No 3: Development of hybrids/varieties with high yield and quality</b>						
<b>Development of hybrids/varieties with high yield and quality in Bitter gourd</b>						
<b>Sub theme 1: Screening of germplasm and development of F1 hybrids in Bitter gourd</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1.	Characterization and field screening of bittergourd germplasm (Long and dark green fruits with prominent tubercles) and development of hybrids	Dept. of Vegetable Science, HC&RI, Periyakulam	Hybridization will be carried out with the selected parents viz, IC398610, IC85643, Paravai Local, MC 30, CO 1 and MC 105	Identification of best performing genotypes	Confirmatory trial will be taken up	Identification of high yielding hybrids in Bitter gourd

<b>Theme No 3: Development of hybrids/varieties with high yield and quality</b>						
<b>Development of hybrids/varieties with high yield and quality in Amaranthus</b>						
<b>Sub theme 2: Screening of germplasm for high yielding red type amaranthus and salinity tolerance</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1.	Characterization and field screening of amaranthus genotypes	Dept. of Veg Science, HC&RI, Coimbatore  HC & RI (W), Trichy	The performance assessment in terms of yield and quality of the identified red amaranthus genotypes along with the check will be taken up at HC & RI, Coimbatore  The identified amaranthus genotypes will be tested under saline and sodic soil along with quality assessment at HC & RI (W), Trichy	Seed multiplication and MLT	ART will be taken up	High yielding Amaranthus genotype will be developed

**Theme No 3: Development of hybrids/varieties with high yield and quality**

**Development of hybrids/varieties with high yield and quality in cluster bean**

**Sub theme 3: Development of dwarf mutant in cluster bean**

<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1.	Characterization of dwarf type cluster bean through mutation breeding	Dept of Horticulture, AC&RI, Madurai	Isolation of short statured early maturity mutant in cluster bean through gamma irradiation	Forwarding the selected genotypes for further generation	Confirmatory trial will be taken up	Non lodging, erect, determinate and synchronized maturity cluster bean mutant will be identified

**Theme No 3:Development of hybrids/varieties with high yield and quality**

**Development of hybrids/varieties with high yield and quality in Underutilized Vegetable Crops**

**Sub theme 4: Evaluation of medicinally important under utilized *vegetables for high yield and quality***

<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1.	Collection and evaluation of underexploited medicinally important vegetable crops	Dept. of Veg Science, HC&RI, Coimbatore Dept of Horticulture, AC&RI, Madurai HC&RI(W), Trichy	Collection and evaluation of <i>Cissus quadrangularis</i> and <i>Basella sp</i> (HC & RI, Coimbatore) Collection and evaluation of <i>Momordica cymbalaria</i> (AC and RI, Madurai) Collection and evaluation of <i>Momordica charantia</i> L. var. <i>muricata</i>	Identification of elite genotypes	Confirmatory trial	Identification of high yielding genotypes suitable for commercial cultivation

		(HC&RI(W), Trichy)			
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<b>Theme No 4: Development of location specific hybrids/varieties</b>						
<b>Development of location specific hybrids/varieties in Brinjal</b>						
<b>Sub theme 1: Development of location specific brinjal varieties</b>						
<b>No</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	<b>Development of Location specific brinjal genotypes</b> <ul style="list-style-type: none"> <li>• Purple round-Manaparai Local Brinjal,HC &amp;RI (W), Trichy</li> <li>• Purple round-Gnamedu Local Brinjal, VRS, Palur</li> <li>• Patchai vari Brinjal-Dindigul Kottampatti local, HC&amp;RI, Periyakulam</li> <li>• Bhavani local, HC &amp;RI, Coimbatore</li> </ul>	HC &RI (W), Trichy VRS ,Palur HC&RI, Periyakulam HC &RI, Coimbatore	Pooling of genetic resources of local types	Purification and identification of elite genotypes	Development of location specific varieties / hybrids	Location specific varieties/hybrids will be developed

<b>Theme No 5: Genetic characterization of vegetable germplasm</b>						
<b>Sub theme 1: Genetic characterization of vegetable germplasm</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1.	DUS characters	Dept. of Vegetable Science, HC&RI, TNAU, Coimbatore  CPMB, TNAU, Coimbatore	Phenological characters/screening for biotic and abiotic characters	Molecular marker based diversity analysis	Getting IC number from NBPGR	Documentation and characterization of trait specific genotypes in vegetable crops

**b. Crop Management**

<b>Theme No. 1: Development of Organic package for curcubitaceous / high value Vegetables</b>						
<b>Sub theme 1: Organic packages for bitter gourd</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Development of organic packages for bitter gourd	Dept. of Vegetable Science, HC&RI, TNAU, Coimbatore	Experiment on organic package for bitter gourd	Residual analysis and Confirmatory evaluation	Validation of the result	Standardization of organic package for Bitter gourd

<b>Theme No. 1: Development of Organic package for curcurbitaceous / high value Vegetables</b>						
<b>Sub theme 2: Organic packages for hill vegetables</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Development of organic packages for high value hill vegetables viz., Chinese cabbage, Broccoli and Lettuce	HRS, Ooty	Experiment on organic package for high value vegetables	Residual analysis and Confirmatory evaluation	Validation of the result	Standardization of organic package for high value hill vegetables

<b>Theme No. 2: Developing a holistic package for roof nutrition garden to urban dwellers</b>						
<b>Sub theme 1: Development of roof nutrition garden</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Development of models for roof nutrition garden	Dept. of Vegetable science, HC&RI, TNAU, Coimbatore	Standardizing package of practices for roof nutrition garden	Confirmatory evaluation	Demonstrations	Standardization of package of practices for roof nutrition garden

<b>Theme No. 3: Screening for salt tolerance in Cassava</b>						
<b>Sub theme 1: Screening of cassava accessions to salt injury in plains</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1.	Evaluation of cassava genotypes for salt tolerance	TCRS, Yethapur	The identified genotypes will be screened for salt tolerance due to irrigation water	Confirmatory evaluation will be taken up	Confirmatory evaluation will be taken up	Identification of suitable cassava genotypes for tolerance to salt injury

<b>Theme No. 4: Standardization of Agro-techniques in vegetables</b>						
<b>Sub theme 1: Standardization of spacing and pruning levels for high leaf yield in Moringa cv. PKM 1</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Standardization of spacing and pruning levels for high leaf yield in Moringa cv. PKM 1	Dept. of Vegetable Science, HC&RI, Periyakulam	Evaluation of different spacing and pruning levels in moringa	Performance assessment of different spacing and pruning levels for high leaf yield in Moringa cv. PKM 1	Confirmatory trial and OFT	Spacing and pruning level for high leaf biomass yield will be standardized



<b>Theme No. 4: Standardization of growth promoting formulations to enhance yield and quality in vegetables</b>						
<b>Sub theme 2: Customized Fertilizer for Bitter gourd</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	<p>Customized Fertilizer will be tested in 5 different agro-climatic zones of TN except high rainfall zone and Hilly zone (Test crop: Bitter gourd)</p> <p>Yield, quality and macro and micro nutrient uptake by the fruit will be assessed</p>	<p>Dept. of SS&amp;AC, Coimbatore</p> <p>Dept. of Vegetable Science, HC&amp;RI, TNAU, Coimbatore</p>	Field experiment will be initiated with different grades of multi-nutrient customized fertilizer for bitter gourd	Performance assessment of different grades of multi-nutrient customized fertilizer for increasing the productivity	Confirmatory trial and OFT	Crop specific and multi-nutrient customized fertilizer for bitter gourd will be developed.

<b>Theme No. 5: Post harvest technology</b>						
<b>Sub theme 1: Standardization of post harvest technologies in vegetables</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Standardizing post harvest technologies in vegetables	Dept. of Vegetable Science, HC&RI, TNAU, Coimbatore	Standardizing post harvest technologies to minimize residue in vegetables	Confirmatory evaluation and demonstration	Validation of the technology	Standardizing post harvest technologies for minimizing the residues in vegetables

<b>Theme No. 6: Integrated weed management</b>						
<b>Sub theme 1: Development of Integrated weed management for vegetables</b>						
<b>Sl. No.</b>	<b>Activity</b>	<b>Centers and Scientists</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>Deliverables</b>
1	Development of Integrated weed management for vegetables	Dept. of Vegetable Science, HC&RI, TNAU, Coimbatore Dept. of Agronomy, TNAU, Coimbatore	Experiments on Integrated weed management technologies in vegetables	Confirmatory evaluation	Large scale demonstration	Technology for weed management will be standardized

### **III. Spices and Plantation Crops**

#### **A. General Recommendations**

- The genetic identity of the turmeric culture BS 9 may be ascertained by conducting molecular characterization studies before recommending it for release (Action : ARS, Bhavanisagar)
- OFT may conducted for on farm decomposition of Cocoa leaf and cocoa pod husk waste (Action: Dept. of Spices and Pl. Crops, HC&RI, Coimbatore)
- Standardization of micro nutrients for cocoa grown under coconut eco system may be studied (Action : CRS, Aliyarnagar)

## 1. Remarks on the ongoing university research projects

S.No	Project No. & title and project period	Name of the Scientist	Remarks
<b>Crop Improvement</b>			
1.	HCRI/BSR/HOR/SPC/2015/003 Breeding of turmeric for high yield and quality Period: July 2015 to June 2018	Dr. P. Hemalatha Asst. Prof. (Hort.) ARS, Bhavanisagar	<ul style="list-style-type: none"> <li>• Completion report may be submitted</li> <li>• Turmeric germplasm may be maintained at</li> <li>• ARS Bhavanisagar</li> <li>• ART may be conducted.</li> <li>• The genetic identity of the turmeric culture BS- 9 may be ascertained by conducting molecular characterization studies before recommending it for release Action : ARS, Bhavanisagar)</li> </ul>
2.	HCRI/CBE/HOR/SPC/2016/007 Induction of variability in turmeric ( <i>Curcuma longa</i> L.) through gamma rays Period: June 2016 to May 2019	Dr. B. Senthamizh Selvi Asst. Professor (Hort.) Dept. of Spices & Plantn. Crops,HC&RI, Coimbatore	<ul style="list-style-type: none"> <li>• Completion report may be submitted for approval</li> </ul>
3.	HCRI/CBE/HOR/SPC/2015/003 Evaluation of ginger ( <i>Zingiber officinale</i> ) genotypes for high yield and resistance to soft rot suitable for Gudalur regions in Nilgiris district Period: June 2015 to May	Dr. S. Karthikeyan Asst. Prof. (Hort.) & Dr.S.Malathi Asst.Prof. (Pl. Path.), HRS, Ooty	<ul style="list-style-type: none"> <li>• Project may be completed and completion report may be submitted for approval</li> <li>• Germplasm of ginger may be maintained at Gudalur</li> </ul>
4.	CPBG/ALR/ PBG/ SPC/ 2013/ 001 Evaluation of ginger genotypes	Dr.V.Sivakumar AP (Hort.) CRS, Aliyarnagar	<ul style="list-style-type: none"> <li>• Project may be completed and completion report to be submitted for approval</li> </ul>

	under Coconut ecosystem Period: Dec 2014 to Nov 2018		
5.	CPBG/PKM/PBG/SPC/2018/001 Identification of coriander genotype with high yield and quality Period: Oct 2017 to Sep 2020	Dr. S. Santha Asst. Prof. (PB&G)	<ul style="list-style-type: none"> <li>• Project may be continued</li> </ul>
6.	HCRI/TKD/HOR/SPC/2019/001 Collection and evaluation of Black Pepper ( <i>Piper nigrum</i> L.) genotypes for yield and qualities under lower Pulney conditions. Period: Oct 2017 to Sep 2020	Dr. T. Thangaselvabai Professor & Head HRS, Thadiyankudisai	<ul style="list-style-type: none"> <li>• Project may be continued</li> </ul>
7.	HCRI/CBE/HOR/SPC/2014/003 Germplasm collection, evaluation and assessment of curryleaf genotypes for yield and quality parameters Period: June 2014 to May 2018	Dr. N. Shoba Professor (Hort.) Dept. of Spices & Plantn Crops, HC&RI, Coimbatore.	<ul style="list-style-type: none"> <li>• Project may be completed and completion report to be submitted for approval</li> </ul>
8.	HCRI/CBE/HOR/SPC/2014/003 Evaluation and characterization of coconut genotypes for yield and quality Period: Dec 2014 to Nov 2018	Dr. M. Mohanalakshmi Asst. Prof. (Hort.) Dept. of Spices & Plantn. Crops,HC&RI, Coimbatore	<ul style="list-style-type: none"> <li>• Project may be completed and completion report to be submitted for approval</li> <li>• A new research sub project may be formulated</li> </ul>
9.	HCRI/TRY/HOR/SPC/2014/005 Evaluation of coconut hybrids for high quality tender coconut Period: Oct 2014 to Sep 2019	Dr. K.S. Vijayselvaraj Asst. Prof. (Hort.) CRS, Veppankulam	<ul style="list-style-type: none"> <li>• The yield of nuts and quality of tender coconut water of the identified hybrids may be recorded.</li> <li>• The project may be continued</li> </ul>

<b>Crop Management</b>			
10.	HCRI/TDK/HOR/SPC/2013/003 A comparative study on non conventional method of bush management on yield and quality of black pepper ( <i>Piper nigrum</i> ) under lower pulney hills Period: Aug 2017 to July 2020	Dr. Sundharaiah Asst. Prof. (Hort.) HRS, Thadiyankudisai	<ul style="list-style-type: none"> <li>The project may be continued</li> </ul>
11.	NRM/ALR/SAC/SPC/ 2015 / 001 Standardization of micronutrient recommendation for cocoa under coconut intercropping systems Period: April 2015 to May 2019	Dr. C. Sudhalakshmi Asst. Prof. (SS&AC) CRS, Aliyarnagar	<ul style="list-style-type: none"> <li>The project may be completed and OFT may be conducted</li> </ul>
12.	HCRI/VRI/HOR/SPC/2016/001 Studies on canopy management in ultra high density planting system of cashew Period: June 2016 to May 2019	Dr.S.Velmurugan Asst. Prof. (Hort.) RRS , Virudhachalam	<ul style="list-style-type: none"> <li>Project may be completed and completion report to be submitted for approval</li> </ul>

### University core projects

S. No.	Project Number & Title	Project leader	Remarks
<b>Crop Improvement</b>			
1.	<b>HCRI/TRY/HOR/SPC/2018/CP029</b> Collection and evaluation of curry leaf ( <i>Murraya koenigii</i> spreng) genotypes for sodic soil <b>Period: 2018-2020</b>	Dr. D. Vidhya, AP (Hort.) HC&RI, TRY K. Gurusamy , AP (Biotech.), HC&RI, TRY	The Project may be continued
2.	<b>CPMB/CBE/PBT/2018/CP077</b> Aroma profiles of <i>Murraya koenigii</i> and <i>Coriandrum sativum</i> ecotypes <b>Period: 2018-2020</b>	Dr. V.P.Santhanakrishnan CPMB- Coimbatore	The Project may be continued
<b>Crop Management</b>			
Sl. No	Project leader and period	Project number and title	Remarks
3.	<b>HCRI/CBE/HOR/SPC/2018/CP020</b> Year round organic production of coriander for greens in shade net house <b>Period: 2018-2020</b>	Dr. S. Balakrishnan, P&H , SPC,CBE	The project may be continued
4.	<b>HCRI/PKM/HOR/SPC/2018/CP031</b> Effect of organic manures and Bio-stimulants on growth and yield of curry leaf ( <i>Murraya koenigii</i> ) <b>Period:2018-2020</b>	Dr. R. Chitra, AP (Hort.), PKM Dr. D. Janaki, AP(SS&AC),PKM	The project may be continued

5.	<p><b>HCRI/CBE/HOR/SPC/2018/CP083</b>  Effect of bio-stimulants and growth regulators on growth, yield and quality of coriander (<i>Coriandrum sativum</i>) and fenugreek (<i>Trigonella foenum-graecum</i>)  <b>Period:2018-2020</b></p>	Dr. A. Ramar Prof. (Hort.)SPC, CBE	The project may be continued
6.	<p><b>HCRI/TKD/HOR/SPC/2018/CP118</b>  Alternate standards (Non-living standards) for growing of black pepper (<i>Piper nigrum</i> L.) by using orthotropic shoots  <b>Period: 2018-2020</b></p>	<p>Dr. T. Thangaselvabai  P&amp;H , HRS, TKD  Dr. I. Yesu Raja, P(Path.), HRS, TKD</p>	The project may be continued
7.	<p><b>HCRI/CBE/HOR/SPC/2018/CP144</b>  Studies on in situ decomposition of coconut boles and roots retained in the soil  <b>Period: 2018-2020</b></p>	<p>Dr. S. Balakrishnan  P&amp;H , Dept. of SPC, TNAU, Cbe</p>	The project may be continued



### C. Cultures under MLT/ART/FLD

#### a. Culture identified for evaluation under MLT

SI. No.	CROP	MLT/ART	Name of the Department/ Station
1.	Turmeric	<b>ART</b> Culture - BS.9 Checks- BSR 1, BSR 2 & CO 2	Agricultural Research Station, Bhavanisagar
Name of the ART		OFT 1. On Farm decomposition of cocoa leaf litter and cocoa pod husk waste Dept. of Spices and Plantation Crops, HC&RI, Coimbatore 2. Standardization of chelated micro nutrients for cocoa grown under coconut ecosystem, ARS, Aliyarnagar	

#### b. Culture identified for evaluation under ART

SI. No.	CROP	ART	Name of the Department/ Station
1.	Coriander	<b>ART</b> Culture - CS 38 Check - CO (CR) 4	Department of Spices & Plantation Crops, HC&RI, Coimbatore
Number of ARTs		40 (Five locations/ District)	

Season – October – November

Duration – 45 days

## D. ACTION PLAN FOR 2019-2022

### A. CROP IMPROVEMENT

		Crop : Turmeric					
Theme No. and Title		Theme No 1 : Development of varieties in spices for high yield and quality Sub Theme I : Development of varieties of turmeric for high yield and high curcumin content through selection					
S.No.	Theme Activity	Name of the Centre		(2019-2020)	(2020-2021)	(2021-2022)	Deliverables
6.	Evaluation of clonal selection	ARS, Bhavanisagar & HC & RI, Coimbatore	The genetic identity of the turmeric culture BS 9 may be ascertained by conducting molecular characterization studies before recommending it for release (Action : ARS, Bhavanisagar)	Conducting ART with promising genotype BS - 9 along with check BSR-2 and CO 2	Evaluation of 5 nos. of identified genotypes for yield and quality along with check varieties BSR 2 and CO 2 at Coimbatore and Bhavanisagar	Submitting the variety release proposal	Identification of high yielding variety with high curcumin content

<b>Crop : Ginger</b>						
<b>Theme No. and Title</b>		<b>Theme No 1 : Development of varieties in spices for high yield and quality</b>				
		<b>Sub Theme II : Development of ginger varieties for high yield, quality and tolerance to soft rot through selection</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
7.	Evaluation of high yielding ginger genotype.	HRS, Ooty	Evaluation of high yielding ginger genotype ACC 578 in large scale area at Gudalur along with check for confirmation of high yield, quality and tolerance to soft rot	Continuation of large scale demonstration	Continuation of large scale demonstration	Identification of high yielding ginger variety suitable for open cultivation in Nilgiris

<b>Crop : Coriander</b>						
<b>Theme No. and Title</b>		<b>Theme No 1 : Development of varieties in spices for high yield and quality</b>				
		<b>Sub Theme III : Development of coriander varieties for high yield and quality</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
8.	Evaluation promising coriander genotypes and varieties for seed and leaf purpose	HC&RI, Coimbatore	Large scale demonstration of leafy coriander culture CS 38 along with CO (CR)4	Evaluation of coriander genotypes for high seed yield and essential oil content	Developing technologies for growing leafy spices under vertical garden	➤ Identification of coriander variety for high leaf and seed yield.
		HC&RI, Coimbatore / Periyakulam	Standardization of technology for growing spices for leaf purpose under vertical garden.	Continued	Continued	➤ Suitable technology for growing spices for leaf purpose under vertical garden will be standardised
		HRS, Thadiyankudisai	Evaluation of Potentiality of available Mexican cilantro under lower Pulney hills for herbage	Continued	Continued	➤ Suitability of coriander Mexican Cilantro for herbage yield

<b>Crop : Curry leaf</b>						
<b>Theme No. and Title</b>		<b>Theme No 1 : Development of varieties in spices for high yield and quality</b>				
		<b>Sub Theme IV : Development of curry leaf varieties for high yield, quality and tolerance to drought</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
9.	Development of curry leaf varieties.	HC&RI, Coimbatore, HC&RI (W), Trichy	Evaluation of curry leaf genotypes for high leaf yield and quality.	continued	continued	➤ Identification of curry leaf varieties for high yield and quality.
		HC&RI, Coimbatore,	Standardization of grafting technique in curry leaf for water deficit condition.	Grafting methodology will be standardised	Suitable root stock for water deficit condition will be identified	Identification of suitable rootstocks for water deficit condition.
<b>Crop : Nutmeg</b>						
<b>Theme No. and Title</b>		<b>Theme No 1 : Development of varieties in spices for high yield and quality</b>				
		<b>Sub Theme V : Development of varieties for high yield and quality in tree spices</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
10.	Development of varieties for high yield and quality in Nutmeg	HRS, Pechiparai, HRS, Thadiyankudisai, CRS, Aliyarnagar	Conducting MLT for Nutmeg culture MF 4 along with local check	Conducting MLT for Nutmeg culture MF 4 along with local check	Conducting MLT for Nutmeg culture MF 4 along with local check	Identification of high yielding nutmeg variety

<b>Crop : Coconut</b>						
<b>Theme No. and Title</b>		<b>Theme No 2 : Development of varieties in plantation crops for high yield and quality</b>				
		<b>Sub Theme I: Evaluation of existing germplasm and selection of superior genotypes for varieties with high yield and quality</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
11.	Development of DXT, TXD and DXD hybrids in coconut for high quality tender nut	CRS, Veppankulam and CRS, Aliyarnagar	Evaluation of existing hybrids of D x T, T x D and D x D for high quality tender nut	continued	continued	Development of hybrids in coconut for high quality tender nut

### **CROP MANAGEMENT**

<b>Crop : Coriander</b>						
<b>Theme No. and Title</b>		<b>Theme No 3 : Standardization of improved agro techniques for increasing the productivity of spices</b>				
		<b>Sub Theme I : Year round production of coriander for greens in shade net house</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
12.	Year round production of coriander for greens.	HC&RI, Coimbatore	Standardization of agro techniques for year round production of	Continued	continued	Developing agro techniques for year round production of

			coriander for leaf purpose under shade net			coriander for leaf in shade net house
<b>Crop: Curry leaf</b>						
<b>Theme No. and Title</b>		<b>Theme No 3 :</b> <b>Standardization of improved agro techniques for increasing the productivity of spices</b>  <b>Sub Theme II :</b> <b>Developing package of practices for organic production of curry leaf</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
13.	Developing package of practices for organic production of curry leaf	HC&RI, Coimbatore HC&RI, Periyakulam Dept. of Sustainable Organic Agriculture, Coimbatore and CPPS, Coimbatore	Standardization of cost effective sustainable organic cultivation practices in curry leaf for yield and quality	Standardization of agro techniques	Confirmation trial	Developing package of practices for organic production of curry leaf

<b>Crop : Cocoa</b>						
<b>Theme No. and Title</b>		<b>Theme No 4 :</b> <b>Standardization of decomposting technology in plantation crops</b>  <b>Sub Theme I :</b> <b>Standardization of on farm decomposting technology for cocoa leaf and pod waste</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>

14.	Standardization of on farm decomposting technology for cocoa leaf and pod waste	Dept. of Spices and Plantation Crops, HCRI, Coimbatore	Conducting OFT on farm decomposting technology for cocoa leaf and pod waste	Conformation trial	Large scale demonstration in farmers field	On Farm decomposition technology for cocoa leaf and pod husk waste will be standardized
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<b>Crop : Cocoa</b>						
<b>Theme No. and Title</b>		<b>Theme No 5 : Standardization of chelated micro nutrients for cocoa</b>				
		<b>Sub Theme I : Standardization of chelated micro nutrients for cocoa grown under coconut eco system</b>				
<b>S.No.</b>	<b>Theme Activity</b>	<b>Name of the Centre</b>	<b>(2019-2020)</b>	<b>(2020-2021)</b>	<b>(2021-2022)</b>	<b>Deliverables</b>
15.	Standardization of chelated micro nutrients for cocoa grown under coconut eco system	CRS, Aliyarnagar	Conducting OFT with Chelated micro nutrients formulations for cocoa grown under coconut eco system	Studies will be continued	Large scale demonstration in farmers field	Chelated micro nutrient formulation for cocoa will be standardized



## **IV. Floriculture and Landscape Architecture**

### **A. General remarks**

- 1) Breeding work in Floriculture may be strengthened. Breeding work on Jasmine, Hibiscus, Nerium, Ixora and Adenium may be taken up. (Action: All centres)
- 2) Projects may be formulated on the basis of requirements of farmers and specific regions (Action: All centres)
- 3) Projects may be formulated for crops occupying larger area rather than for crops grown in meagre area. (Action: All centres)
- 4) Achievements made at FRS, Thoivalai since inception may be submitted as a report to the Dean (Hort.), HC & RI, Coimbatore and the Director of Research, TNAU by Sep 2019.  
(Action: FRS, Thoivalai)
- 5) DUS characterization and molecular characterization may be done for all valuable plant collections. (Action: All centres)

## B. Remarks on ongoing University Research Projects

### (i) Crop Improvement

S. No.	Project No. & title and project period	Project leader	Remarks
1	HCRI/CBE/HOR/FLO/2017/002: Evaluation and clonal selection in underutilized jasmine species ( <i>Jasminum</i> spp.) Period: Sep 2017 - Aug 2020	Dr. M. Ganga HC & RI, Coimbatore	<ul style="list-style-type: none"><li>• Distinctiveness of the <i>J. multiflorum</i> culture Acc-Jm-1(KMD) may be confirmed through molecular characterization.</li><li>• Market acceptability of <i>J. nitidum</i> variety CO.1 Star Jasmine and <i>J. multiflorum</i> culture Acc-Jm-1(KMD) may be assessed.</li></ul>
2	HCRI/CBE/HOR/FLO/2013/006 Development of varieties in <i>Hibiscus rosa-sinensis</i> for high yield, quality and enhanced pigment content Period: Sep 2017 - Aug 2019	Dr. S.P. Thamaraiselvi HC & RI, Coimbatore	<ul style="list-style-type: none"><li>• The project may be closed and the completion report submitted with the salient findings.</li><li>• New project may be proposed.</li></ul>
3	HCRI/PKM/FLO/LOT/2015/001: Collection and evaluation of lotus and lily genotypes suitable for loose flowers and for landscaping Period: Jan 2015 - Dec 2018	Dr.J.Prem Joshua FRS, Thoivalai	<ul style="list-style-type: none"><li>• The project may be closed and the completion report submitted with the salient findings.</li><li>• New project may be proposed.</li></ul>

4.	HCRI/CBE/HOR/FLO/2015/007 Evaluation of celosia genotypes for yield and quality	Dr. P. Aruna HC & RI, Coimbatore	<ul style="list-style-type: none"> <li>• The correct method of naming accessions may be followed.</li> <li>• Maintenance of the accessions through vegetative propagation may be attempted</li> <li>• Grouping of collections based on flower colour may be done</li> <li>• The project may be closed and the completion report submitted with the salient findings.</li> </ul>
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**(ii) Crop Management**

<b>S. No.</b>	<b>Project No. &amp; Centre</b>	<b>Title of the subproject</b>	<b>Remarks</b>
1.	HCRI/CBE/HOR/FLO/2017/001 : Effect of foliar application of humic acid and silicic acid on growth, yield and quality of marigold ( <i>Tagetes erecta</i> ) cv. Coimbatore Local Yellow Period: Oct 2017 - Oct 2020	Dr. S. Subramanian HC & RI, Coimbatore	The project may be closed and the completion report submitted with the salient findings.
2.	HCRI/PKM/FLO/ORC/2015/001 Standardization of agro techniques for commercial cultivation of orchids under Thovalai conditions Period: Jan 2015 - Dec 2018	Dr. J. Prem Joshua FRS, Thovalai	The project may be closed and the completion report submitted with the salient findings.

3.	HCRI/OTY/HOR/FLO/2017/001: Assessment of the performance of gladiolus ( <i>Gladiolus grandiflorus</i> ) under Nilgiris conditions Period: May 2017 - Apr 2019	Dr. M. Ganga HC & RI, Coimbatore	The project may be closed and the completion report submitted with the salient findings.
4.	AICRP/NRM/CBE/SAC/002: AICRP on Soil test crop response Soil Test Crop Response Correlation Studies through IPNS for Chrysanthemum ( <i>Chrysanthemum indicum</i> ) Period: Apr 2017 - Mar 2020	Dr. S.Maragatham Dr. J. Balamurugan Dr. M. Gopalakrishnan DNRM, Coimbatore	The nutrient recommendation technique standardized may be recommended to the chrysanthemum belt in Salem District.

### C. Cultures under ART/MLT

#### MLT/ART of *Jasminum multiflorum* culture Acc.Jm-1(KMD)

As per the recommendations of the Crop Scientist Meet (Hort.) 2018, MLT and ART of the clonal selection Acc.Jm-1(KMD) of *Jasminum multiflorum* were laid as detailed below.

#### (a) MLT

MLT is in progress in the following 4 centres.

1. HC&RI(W), Trichy
2. Dept. of Floriculture & Medicinal Crops, HC&RI, Periyakulam
3. Dept. of Horticulture, AC & RI, Madurai
4. Agricultural Research Station, Bhavanisagar

#### (b) ART

ART is in progress in 10 farmers' fields at Coimbatore, Erode, Karur, Trichy, Salem, Namakkal and Theni Districts.

#### Merits of the culture Acc.Jm-1(KMD) of *Jasminum multiflorum*:

- Year-round flowering
- Profuse flowering in winter
- Good quality parameters
  - Bold buds
  - Attractive pink colour corolla
  - Pink corolla tube with contrasting green tinge at the base
  - Long corolla tube – suitable for easy harvesting and string making
  - Longer shelf life (flower buds remain unopened for 10 hours under room temperature and 52 hrs under cold storage at 7-8<sup>0</sup>C)
  - Higher fragrance level than Local White Kakada
- Attractive plant architecture (ideal as decorative ornamental also)

#### Performance of *J. multiflorum* selection Acc.Jm-1(KMD) (3½ year old plants)

S.No.	Jasmine genotype	Annual flower yield		*Consumer preference Scoring
		Per plant yield (kg/plant/yr)	Estimated yield (t/ha/yr)	
1.	Acc. Jm.1(KMD) ( <i>J. multiflorum</i> )	0.985	3.30	Excellent (4) (on par with CO.1 Jathimalli)
2.	Check variety CO.1 Jathimalli ( <i>J. grandiflorum</i> )	2.16	7.19	Excellent (4)

**\*Scores: Poor (1), Medium (2), Good (3), Excellent (4)**

## 2) Action Plan for 2019-20 on the identified themes

### I. CROP IMPROVEMENT

#### Theme 1: Breeding for development of improved varieties in Jasmine

S. No.	Activity	Centre & Scientists	Action Plan for Year 1 (2019-'20)	Deliverables
<b>Sub-theme 1: Development of improved varieties through clonal selection</b>				
i.	Collection, characterization and evaluation of <i>J. sambac</i> genotypes	Coimbatore Horticulturist Entomologist	<ul style="list-style-type: none"> <li>Survey and market analysis</li> <li>Identification and selection of promising types for commercial cultivation</li> </ul>	Selection of superior clones in <i>J. sambac</i>
ii	Screening of underutilized <i>Jasminum</i> sp.		<ul style="list-style-type: none"> <li>Evaluation of the clonal selection Acc.Jm-1(KMD) of <i>J. multiflorum</i> under MLT and ART</li> </ul>	Availability of superior clones of underutilized jasmine species for commercial cultivation
<b>Sub-theme 2: Development of improved varieties through mutation breeding</b>				
i.	Mutation breeding in <i>Jasminum</i> spp. for yield, quality and disease resistance	Coimbatore Horticulturist Pathologist	<ul style="list-style-type: none"> <li>Analysis of sensitivity of commercial and underutilized <i>Jasminum</i> species to mutagens</li> <li>Imposing mutation treatments</li> <li>Evaluation of <math>M_1V_2</math> and <math>M_1V_3</math> generations</li> </ul>	<ul style="list-style-type: none"> <li>Creation of variability through mutation breeding</li> </ul>

#### Theme 2: Evaluation of cut flower Chrysanthemum varieties under open field for use as loose flower

S. No.	Activity	Centre & Scientists	Action Plan for Year 1 (2019-'20)	Deliverables
<b>Sub-theme 1: Evaluation of ruling cut flower varieties under open field for suitability as loose flower</b>				
i.		Coimbatore Horticulturist Entomologist	<ul style="list-style-type: none"> <li>Evaluation of cut flower Chrysanthemum varieties under open field for use as loose flower and assessment of yield and quality</li> <li>Assessment of cost economics in comparison with protected cultivation for cut flower</li> </ul>	Availability of agro-techniques to grow cut varieties under open field for loose flower

## II. CROP MANAGEMENT

### Theme 1: Development of techniques for off-season flowering in Jasmine

S. No.	Activity	Scientists and Centre	Action Plan for Year 1 (2019-'20)	Deliverables
<b>Sub-theme 1: Standardization of off-season flowering in Gundumalli (<i>J. sambac</i>) through physiological intervention</b>				
i.	Inducing off-season flowering through pruning and use of growth regulators	<u>Coimbatore &amp; Madurai</u> Horticulturist Crop Physiologist	Standardization of pruning and growth regulator application	Availability of technology to induce off season flowering in Jasmine
<b>Sub-theme 2: Standardization of off-season flowering in Gundumalli (<i>J. sambac</i>) through manipulation of production system</b>				
i.	Inducing off-season flowering through protected cultivation	<u>Coimbatore</u> Horticulturist Crop Physiologist Plant Protection	Standardization of techniques for protected cultivation by optimizing following practices: <ul style="list-style-type: none"><li>• Protected structure (polyhouse/shadenet house)</li><li>• Pruning techniques</li><li>• Subjecting plants to soil moisture stress to induce flowering</li></ul>	Availability of technology to induce off season flowering in Jasmine

## Theme 2: Standardization of improved agro-techniques for commercial flower and ornamental crops

S. No.	Activity	Scientists and Centres	Action Plan for Year 1 (2019-'20)	Deliverables
<b>Sub-theme 1: Standardization of mass propagation protocols for tuberose</b>				
i.	Standardization of mass propagation protocols for tuberose through pro-tray technology and micropropagation	<u>Coimbatore</u> Horticulturist Biotechnologist	Validation of micropropagation protocol for tuberose	Availability of technologies for mass propagation of tuberose
<b>Sub-theme 2: Standardization of spacing and nutrient requirements for Ixora</b>				
i.	Standardization of spacing and nutrient requirement	<u>Trichy</u> Horticulture Soil Scientist	Standardization of spacing	Availability of spacing and nutrient recommendations for commercial cultivation of Ixora
<b>Sub-theme 3: Standardization of techniques for delaying bud opening in Nerium</b>				
i.	Standardization of techniques for delaying bud opening in Nerium	<u>Coimbatore</u> Horticulturist Soil Scientist Crop Physiologist	Standardization of techniques for delaying bud opening through pre-harvest application of growth regulators	Availability of techniques for delaying bud opening in Nerium for adoption by farmers
<b>Sub-theme 4: Development of agro-techniques for commercial cultivation of ornamental fillers</b>				
i.	Optimization of cultural techniques for potential ornamental filler crops ( <i>Dracaena</i> spp., <i>Eucalyptus</i> spp., <i>Asparagus</i> spp., Ferns [ <i>Nephrolepis</i> spp., <i>Rumohra</i> spp., <i>Adiantum</i> spp., <i>Pteris</i> spp., <i>Asplenium</i> spp., etc.)	<u>Coimbatore</u> <u>Yercaud</u> <u>Ooty</u> <u>Thovalai</u>  Horticulturists	<ul style="list-style-type: none"> <li>Optimization of growing conditions (open/protected), growing media, water, nutrition, etc.</li> <li>Working out cost economics</li> </ul>	Availability of cultural techniques for commercial cultivation of potential ornamental filler crops



## **V. Medicinal & Aromatic Crops**

### **A. General Recommendations**

- In *Solanum nigrum* , the promising genotype *Sn* 19 (Kallipalayam local ) is accepted for variety release during 2019-20
- In *Gloriosa superba*, micro tuber technology is accepted for technology release during 2019-20

## B. Remarks of the ongoing university research projects

S.No.	Project No. Title & Period	Name of the Scientist(s) & Centre	
<b>I.UNIVERSITY RESEARCH SUB PROJECTS</b>			
<b>A. CROP IMPROVEMENT</b>			
1.	HCRI/CBE/HOR/MED/2016/002 Characterization and evaluation of <i>Gymnema sylvestre</i> R.Br January,2016 to January,2019	Dr.L.Nalina Associate Professor (Horticulture) Dept.of Medicinal& Aromatic Crops, HC &RI, TNAU,Coimbatore	<ul style="list-style-type: none"> <li>Promising genotypes has to be proposed for multilocation trial.</li> </ul>
2.	<b>HCRI/CBE/HOR/MED/2016/002</b> Induced mutagenesis for improving the biomass in senna ( <i>Cassia angustifolia</i> )	Dr.I.Geethalakshmi Assistant Professor (Horticulture) Dept.of Medicinal& Aromatic Crops, HC &RI, TNAU,Coimbatore	<ul style="list-style-type: none"> <li>Sennoside content has to be estimated for mutants.</li> </ul>
<b>B.CORE PROJECT</b>			
1.	HCRI/CBE/HOR/MED/2018/CP021 Development of micro tuber technology for cost effective multiplication of quality planting material in <i>Gloriosa superba</i>	Dr.K.Rajamani Professor and Head Dr.I.Geethalakshmi, Assistant Professor (Hort.)	The project may be continued

**C. Action plan – 2019-2022**

**Crop improvement**

<b>Theme No.1 : Development of varieties in medicinal and aromatic crops for high yield and quality</b>						
<b>Sub theme I: Germplasm enrichment, evaluation and screening of Glory lily genotypes</b>						
<b>S. No.</b>	<b>Activity</b>	<b>Scientists and centres</b>	<b>Year 1 2019-20</b>	<b>Year2 2020-21</b>	<b>Year 3 2021-22</b>	<b>Deliverables</b>
1 .	Assembling and screening of promising Glory lily genotypes through clonal selection	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Survey and collection of promising genotypes	Evaluation of promising genotypes for morphological traits under field conditions	Studies on the performance of genotype	Identifying promising genotype for high yield and quality.
<b>Sub theme II. Development of variety in Gymnema for high yield and gymnemagenin content through selection</b>						
	Evaluation and clonal selection	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Proposing the promising genotype for MLT	Proposing the promising genotype for ART	Proposing the promising genotype for ART	Developing variety with high yield and gymnemagenin content
<b>Sub theme III. Development of variety in senna for high biomass through mutation breeding</b>						
	Induction of mutation in senna	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Fixing LD <sub>50</sub> and raising M <sub>1</sub> population	Raising M <sub>2</sub> progenies and identification of promising types	Evaluation of promising mutated progenies for yield and quality	Developing variety with high biomass and yield
<b>Subtheme V Development of variety in vetiver for high yield and oil content through selection</b>						
	Assembling and screening of promising vetiver genotypes and varieties through clonal selection	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Enrichment of vetivergenotypes and varieties	Evaluation of genotypes and varieties for yield and quality	Conducting confirmatory trial	Identification of promising genotype for high yield and oil content

<b>Subtheme VI Development of variety in palmarosa for high yield and oil content through selection</b>						
	Screening of palmarosa varieties suited to Tamil Nadu condition	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Collection and evaluation of varieties for yield and quality	Evaluation of varieties for yield and quality	Evaluation of varieties for yield and quality	Identification of palmarosa variety suitable for Tamil Nadu Condition
<b>CROP MANAGEMENT</b>						
<b>Theme 1. Standardization of propagation techniques for medicinal crops</b>						
<b>Sub theme 1. Standardization of micro tuber technology for glory lily</b>						
1.	Development of tubers in glory lily through seeds	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Proposed for technology release	-	-	Development of cost effective propagation technique in glory lily
<b>Sub theme 2. Standardization of propagation techniques for rare and endangered medicinal plants</b>						
	Standardization of propagation techniques for rare and endangered medicinal plants	Horticulturist, Dept. of Medicinal & Aromatic Crops Coimbatore	Collection and establishment of mother block of rare and endangered medicinal plants.	Standardization of propagation techniques	Confirmation of the experiments	Development of propagation techniques for rare and endangered medicinal plants

## VI. PLANT PROTECTION

The review of the University Research Projects pertaining to crop protection in Horticulture was conducted under the chairmanship of the Director (CPPS), TNAU, Coimbatore at Seminar Hall of the Department of Plant Pathology on 24.04.2019 and 25.04.2019. The Professor and Heads of the Department of Agricultural Entomology, Plant Pathology and Nematology co-chaired the review of the work done.

### A. General Recommendations

1. The proposed on farm trial on management of tea mosquito bug in guava may also be tested in Tea eco-system (Action: Professor & Head, Department of Agrl. Entomology, TNAU, Coimbatore)
2. Large scale demonstration on biological management of rhizome rot in ginger should be carried out in Gudalore areas of Nilgiris along with chemical management practice (Action: Dr.S.Sundaravadana, Dept. of Spices and Plantation Crops, TNAU, Coimbatore in colloboration with HRS, Ooty).
3. Large scale demonstration on management of root knot nematode, *Meloidogyne incognita* in tuberose should be carried out in Coimbatore and Kanyakumari districts (Action: Professor & Head, Dept. of Nematology, TNAU, Coimbatore: Dr. T.Senthilkumar Asst. Prof. (Nem.) FRS, Thovalai)
4. Management of root knot nematode in guava experiments should be carried out in newly planted and established guava orchards (Action: Professor and Head, Dept. of Nematology, TNAU, Coimbatore)
5. Any new microbial inoculants claimed the best by the scientists should have been identified up to species level. The cultures should be deposited at ICAR – NBAIMCC, Mau, Uttar Pradesh and accession number to be obtained. All microbial referral cultures should be deposited with Dept. of Plant Pathology, TNAU, Coimbatore for getting a common accession number (Action: Professor and Heads of Entomology/Plant Pathology/Nematology and all Plant Protection Scientists of TNAU)

### B. List of URP/AICRP/ERP

Crop	Agrl. Ent. (No.)	Pl. Path. (No.)	Nematology (No.)
<b>University Research Projects</b>			
Fruits	2	4	3
Vegetables	5	8	9
Flowers	-	1	1
Spices & Plantation crops	5	2	-
Medicinal & Aromatic Crops	-	2	-
<b>Total</b>	<b>12</b>	<b>17</b>	<b>13</b>
<b>AICRP Projects</b>			
Fruits	1	3	1a

Vegetables	-	1	1b
Flowers	-	-	-
Spices & Plantation crops	1	1	-
Medicinal & Aromatic Crops	1	1	-
<b>Total</b>	<b>3</b>	<b>6</b>	<b>1</b>
<b>Externally Funded Projects</b>			
Fruits	-	1	1
Vegetables	3	2	-
Flowers	-	-	-
Spices & Plantation crops	-	-	-
Medicinal & Aromatic Crops	-	1	-
<b>Total</b>	<b>3</b>	<b>4</b>	<b>1</b>

### C. Remarks on ongoing University Research Projects

S.NO	Project Details	Project wise remarks
<b>I. Fruits</b>		
<b>Entomology</b>		
S.No.	Project No., Title and PI	Remarks
1	<p><b>CPPS/MDU/PAT/FRU/2016/001</b>            Studies on diversity, temporal trend and integrated management of mite species infesting acid lime  <b>Period:</b> Sept.2016 to Aug.2019            Dr. C. Chinniah, Professor &amp; Head, Dept of Entomology, AC&amp;RI, Madurai</p>	This proposal may be closed and a new proposal submitted in the same line for botanical formulation development for the management of mites.
2	<p><b>CPPS/APK/ENT/FRU/2016/001b</b>            Eco-friendly management of subterranean Termites in arid zone fruit trees  <b>Period:</b> December 2016 to November 2019            Dr. D.S. Rajavel, Professor &amp; Head, RRS, Arupukottai</p>	This project may be continued.
<b>Plant Pathology</b>		
3	<p><b>CPPS/TDK/PAT/FRU/2016/001</b>            Biological control of wilt disease of hill banana incited by <i>Fusarium oxysporum</i> f.sp. <i>cubense</i>  <b>Period:</b> October 2016 to September 2019            Dr. I. Yesuraja, Professor (Pl. Path.) Thadiyankudisai</p>	The available cultures should be deposited in the Dept. of Plant Pathology and completion report should be submitted on or before 30.06.2019. New Project proposal may be proposed in Coconut <i>Ganoderma</i> disease in consultation with Professor and Head, CRS, Veppankulam.
4	<p><b>CPPS / CBE/ PAT/ FRU/2017/001</b>            Testing of evaluation and testing of Mahaffee spore trap for the detection of air borne inocula of grapevine mildews  <b>Period:</b> September 2017 – August 2020            Dr. K. Kamalakannan, Professor (Pl. Path.) TNAU, Coimbatore</p>	This project may be continued.
5	<p><b>CPPS/PAI/PAT/FRU/2016/001</b>            Management of gummosis and die-back of mango through fungicides and cultural practices.  <b>Period:</b> October 2016-September 2019            Dr. T. Anand, Asst. Prof. (Plant Pathology) RRS, Paiyur</p>	Results of the sub-project may be proposed for OFT. Completion report needs to be submitted on or before 30 <sup>th</sup> November, 2019.

6	<p><b>CPPS/APK/PAT/FRU/2013/001</b> Development of management strategies against damping off in custard apple, ber, manila tamarind, bael, aonla and wood apple. <b>Period:</b> August 2013 to July 2016 Dr. P. Mareeswari, Asst. Prof. (Pl. Path.)</p>	<p>New sub project has to be proposed on basal rot/ purple blotch in onion and other vegetable crops on or before 15.05.2019. Closer proposal may be submitted on or before 30th June, 2019.</p>
<b>Nematology</b>		
7	<p><b>HCRI/CBE/NEM/FRU/2014/003</b> Root knot nematode management in guava <b>Period:</b> Jan. 2015 - Dec. 2018 Dr. P. Vetrivelkai, Asst. Prof. (Nem.) HC &amp;RI, Coimbatore</p>	<p>Results of the sub-project may be proposed for OFT. Completion report should be submitted on or before 30<sup>th</sup> June, 2019.</p>
8	<p><b>CPPS/CBE/NEM/FRU/2017/001</b> Assessment of nematode induced fungal wilt complex in pomegranate (<i>Punica granatum</i> L.) and formulating biomanagement strategy <b>Period:</b> Jan. 2018 - Dec. 2021 Dr. K. Poornima, Professor and Head (Nematology), TNAU, Coimbatore</p>	<p>The project work may be continued.</p>
9	<p><b>CPPS/TRY/NEM/FRU/2018/CP094</b> Management of citrus nematode by liquid bio-products applied through drip irrigation system <b>Period:</b> September 2018 to August 2021 Dr. N. Seenivasan Assoc. Professor (Nematology)</p>	<p>This project may be continued.</p>
<b>II. Vegetables</b>		
<b>Entomology</b>		
10.	<p><b>CPPS/CBE/ENT/VEG/2018/002</b> Dissipation pattern of insecticides applied on tomato agro-ecosystem <b>Period:</b> April 2018 to March 2021 Dr. B. Vinothkumar, Assistant Professor (Agrl. Entomology), TNAU, Coimbatore</p>	<p>The project may be continued.</p>
11.	<p><b>CPPS/TRY/ENT/VEG/2016/001</b> Screening of bhendi entries/varieties and evaluation botanicals / newer insecticidal molecules for management of bhendi fruit borer complex <b>Period:</b> June 2016 - December 2019 Dr. M. Chandrasekaran, Asst. Professor (Entomology), HC&amp;RI (W), Trichy</p>	<p>The project may be continued up to Dec 2019 and carryout artificial screening including TNAU varieties with standard screening protocol. New Proposal should be submitted on or before 30.06.2019.</p>



12.	<p><b>CPPS/MDU/ENT/VEG/2017/001</b> Bio-ecology and management of tea mosquito bug, <i>Helopeltis</i> spp. (Heteroptera: Miridae) in moringa eco-system <b>Period:</b> June 2017- May 2020 Dr. K. Suresh, Asst Prof. (Agrl. Ento.) AC&amp;RI, Madurai</p>	The project may be continued. This project should be reoriented in consultation with Professor and Head, Dept. of Agrl. Entomology, Coimbatore and AC&RI, Madurai. Correlation with weather data and pest incidence studies should be carried out. Residue analysis for fruits and leaves should be carried out. Standard check profenophos and buprofezin may be included and lamda cylothrin may be deleted.
13.	<p><b>CPPS/PKM/ENT/VEG/2018/CP 157</b> Nano formulation for controlled release of parapheromone (cue lure) to manage fruit flies in cucurbits <b>Period:</b> January 2019 to December 2020 Dr. M. Kannan, Asst. Prof. (Agrl. Entomology) HC &amp; RI, Periyakulam</p>	The project may be continued.
14.	<p><b>CPPS/CBE/ENT/VEG/2018/001</b> Silicon induced resistance to pests of Brinjal <b>Period:</b> April, 2018 - May, 2020 Dr. E. Sumathi, Assoc. Prof. (Entomology) TNAU, Coimbatore – 3</p>	The project may be continued. The treatments and observations have to be revised in consultation with Professor and Head, Dept. of Soil Science and carryout the midterm corrections.
<b>Plant Pathology</b>		
15.	<p><b>CPPS/MDU/PAT/VEG/2017/002</b> Development and validation of endospore based formulation of <i>Bacillus</i> sp. for the management of major soil borne diseases of tomato <b>Period:</b> July, 2017 to June, 2020 Dr. S. Harish, Asst. Prof.(Plant Pathology), AC&amp;RI, Madurai</p>	The project may be continued. Culture confirmation work should be carried out through molecular methods.
16.	<p><b>CPPS/MDU/PAT/VEG/2017/001</b> Documentation of Begomoviruses infecting brinjal and their management <b>Period:</b> June 2017- May 2020 Dr. K. Kalpana AC &amp; RI, Madurai</p>	The project may be continued.
17.	<p><b>CPPS/CBE/PAT/VEG/2016/001</b> Combating pandal vegetable (Snake gourd) diseases by organic approaches. <b>Period:</b> June 2016- May 2019 Dr. S.K. Manoranjitham, Asst. Prof. (Plant Pathology), TNAU, Coimbatore</p>	The project may be closed and completion report should be submitted on or before 30 <sup>th</sup> June, 2019.

18.	<b>CPPS/CBE/PAT/VEG/2017/001</b> Evolving organic management strategies to combat fusarial wilt and <i>Peanut bud necrosis virus</i> disease in tomato. <b>Period:</b> August 2017 to August 2020 Dr. S.K. Manoranjitham, Asst. Prof.(Plant Pathology), TNAU, Coimbatore	The project may be continued. C:B ratio may be worked out.
19.	<b>CPPS/CBE/PAT/VEG/2017/001</b> Management of postharvest decay of carrot ( <i>Daucus carota</i> L. var. <i>sativus</i> ) through alternative strategies <b>Period:</b> July 2017 to June 2020 Dr.S. Vanitha, Prof. (Plant Pathology) TNAU, Coimbatore	The project may be continued. Organoleptic test and edibility may be studied.
20.	<b>CPPS/ VRM/ PAT/ VEG/ 2018/ 001.</b> Development of integrated disease management module for viral and phytoplasma diseases of brinjal. <b>Period:</b> January 2018 – December 2020 Dr. D. Dinakaran, Professor and Head ARS, Virinjipuram – 632 104	The project may be continued. Vector population may be counted and include entomologist as one of the project leader.
21.	<b>CPPS / CBE / PAT / VEG / 2018 / 001</b> Evaluation of micronutrients towards the development of an IPM strategy for the virus diseases management in cucurbitaceous vegetable, snake gourd. <b>Period:</b> April 2018 to March 2021 Dr. G. Karthikeyan, Professor (Pl. Pathology) TNAU, Coimbatore 641 003	The project may be continued. <i>Pseudomonas fluorescens</i> (Pf1) may be included for the integrated management. Boric acid may be used instead of borax.
22.	<b>CPPS/YTP/PAT/TUB/2018/001</b> Integrated management of cassava mosaic disease in tapioca Period: October 2018 to September 2021 Dr. M. Deivamani, Asst. Prof. (Pl. Pathology) Tapioca and Castor Research Station, Yethapur	Get silica gel based nanoparticle from Dept. of Nanoscience and Technology, TNAU, Coimbatore and their efficacy may be tested. Virus load may be assessed. The project may be continued. The project leader has to propose additional URP.
<b>Nematology</b>		
23.	<b>CPPS/CBE/NEM/VEG/2017/001</b> Biocontrol potential of egg parasitic fungus, <i>Purpureocillium lilacinum</i> against root knot nematode, <i>Meloidogyne incognita</i> on tomato. <b>Period:</b> Sep 2017 to Aug 2020 Dr. A. Shanthi, Professor (Nematology) TNAU, Coimbatore	Culture characterization work should be carried out through morphological viz., conidial viability, measurements, suitable media and colony growth and molecular methods. After confirmation of the organism, the project may be continued.
24.	<b>CPPS/CBE/NEM/VEG/2016/002</b> Biochemical basis of root knot nematode resistance in tomato and tuberose. <b>Period:</b> October 2016- September 2018 Dr.P. Kalaiarasan, Asst. Prof. (Nem.) TNAU, Coimbatore	Since the project duration is already over, completion report needs to be submitted on or before 31.05.2019. A new URP may be proposed.

25.	<p><b>CPPS/PKM/NEM/VEG/2016/001</b>  Management of brinjal pests using native entomopathogenic nematode and its symbiotic bacteria.  <b>Period:</b> May 2016- Feb. 2019  Dr. S. Prabhu, Asst. Prof. (Nematology) HC &amp;RI, Periyakulam</p>	Results of the sub-project may be proposed for OFT. Completion report needs to be submitted on or before 30 <sup>th</sup> June, 2019.
26.	<p><b>CPPS/CBE/NEM/VEG/2016-001</b> Enhancement of performance of nematode antagonistic bioagents, <i>Pochonia chlamydosporia</i> and <i>Pasteuria penetrans</i> for the management of sedentary endoparasitic nematodes of polyhouse cucumber  <b>Period:</b> Oct, 2018 - Sept. 2019  Dr. N. Swarnakumari, Asst. Prof. (Nem.) TNAU, Coimbatore</p>	Results of the sub-project may be proposed for OFT. Project may be continued upto September 2019 and the Completion report to be submitted on or before 30 <sup>th</sup> November, 2019.
27.	<p><b>CPPS/CBE/NEM/VEG/2018/CP019</b>  Developing bioformulations of bioagents and EPNs for the management of root knot nematode and ash weevil complex in brinjal  <b>Period:</b> Sep, 2018 - Aug. 2020  Dr. N. Swarnakumari, Asst. Prof. (Nem.) TNAU, Coimbatore</p>	Oil formulation development may be standardized along with scientist from Entomology/Pathology. The project may be continued.
28.	<p><b>CPPS /MDU/NEM/VEG/2015/001</b>  Management of root-knot nematode, <i>Meloidogyne incognita</i> on tomato using bioinoculants  <b>Period:</b> April 2015 to March 2018  Dr. K. Devrajan, Professor (Nematology)</p>	Since the project duration is over, completion report needs to be submitted on or before 30.06.2019.
29.	<p><b>CPPS/CBE/ NEM/ VEG/ 2018 /001.</b>  Biocontrol of root - knot nematode, (<i>Meloidogyne incognita</i>) in cucumber  <b>Period:</b> 2018- 2021  Dr. G. Jothi, Associate Prof. (Nematology) TNAU, Coimbatore-641003</p>	The project may be continued.
30.	<p><b>CPPS/PLR/NEM/VEG/2018/002:</b>  Survey and identification of nematode associated with vegetables in Cuddalore district.  <b>Period:</b> Nov 2018 to Oct 2021  Dr. K. Senthamizh, Asst. Prof. (Nematology) VRS, Palur</p>	The project may be continued.
31.	<p><b>CPPS/PLR/NEM/VEG/2018/001:</b>  Management of root-knot nematode <i>Meloidogyne incognita</i> in brinjal.  <b>Period:</b> Nov 2018 to Oct 2021  Dr. K. Senthamizh, Asst. Prof. (Nematology) VRS, Palur</p>	The project may be continued.

<b>III. Spices and Plantation</b>		
<b>Entomology</b>		
32.	<p><b>CPPS/ ALR /ENT/SPC/2015/002</b> Reaction of location specific new coconut hybrids (D x T, T x D &amp; T x T), Exotic, local Tall ecotypes and dwarf cultivars against coconut pests for exploitation of resistance <b>Period:</b> July 2015 – June 2018 Dr K. Rajamanickam, Professor (Agrl. Ento.), CRS, Aliyarnagar</p>	Since the project duration is over, completion report needs to be submitted on or before 31.05.2019.
33.	<p><b>CPPS/ ALR/ ENT/ SPC/ 2017 / 001</b> Studies on the population dynamics and management of Rugose spiralling whitefly, <i>Aleurodicus rugioperculatus</i> Martin in coconut <b>Period:</b> May 2017 to April 2020 Dr. M. Alagar, Asst. Prof.(Entomology), CRS, Aliyarnagar</p>	The project may be continued. Untreated control field may be compared. Yield loss should be assessed. Correlation with weather data and pest incidence studies should be carried out.
34.	<p><b>CPPS/MDU/ENT/EVA/2017/001</b> Evaluation of different bait material to attract termites and formulation of termite poison cake. <b>Period:</b> August 2017 to July 2020 Dr. K. Premalatha, Asst. Prof. (Agrl. Ento.)</p>	Project was permitted for presentation in the Non Crops Scientists Meet.
35.	<p><b>CPPS/CBE/ENT/SPC/2018/CP 018</b> Insect diversity studies and standardization of mass multiplication of potential natural enemies for curry leaf insect pests <b>Period:</b> September 2019- September 2021 Dr. N.Chitra, Assoc. Prof. (Agrl. Ento.) TNAU, Coimbatore</p>	The project may be continued. The potential parasitoids can be mass cultured in collaboration with biocontrol unit, Dept. of Entomology, TNAU, CBE. The taxonomic identity of the insects and parasitoids in curry leaf should be documented.
36.	<p><b>CPPS/ CBE/ ENT/ SPC/ 2018 / CP070</b> Biointensive management of Rugose spiralling whitefly, <i>Aleurodicus rugioperculatus</i> Martin in coconut <b>Period:</b> September 2018- October 2021 Dr. T. Srinivasan, Asst. Prof. (Agrl. Ento.) TNAU, Coimbatore</p>	The project may be continued.

<b>Plant Pathology</b>		
37.	<b>CPPS/ALR/PAT/SPC/2016/001.</b> Documentation of hot spot areas and optimization of management strategies for coconut root (wilt) disease in Tamil Nadu. <b>Period:</b> January 2016 – January 2019 Dr. E.Rajeswari Assoc. Prof. (Pl. Path.), CRS, Aliyar	Since the project duration is over, completion report needs to be submitted on or before 31.05.2019. Two new URPs may be proposed. .
38.	<b>CPPS/BSR/PAT/SPC/2019/001.</b> Studies on the effect of Silicon on the control of Rhizome Rot, Leaf Blight and Leaf Blotch of Turmeric <b>Period:</b> March 2019 – April 2022 Dr. Sangeetha Panickar, Professor (Path.) ARS, Bhavanisagar	The project may be continued.
IV		
<b>Medicinal and Aromatic Crops</b>		
<b>Plant Pathology</b>		
39.	<b>CPPS/CBE/PAT/MED/2018/001</b> <i>Bacillus</i> spp. mediated management of root rot diseases of <i>Gloriosa superba</i> <b>Period:</b> January 2018 to Dec.2020 Dr. P. Muthulakshmi, Assoc. Prof. (Pl. Path.), HC&RI, TNAU, Coimbatore	The project may be continued.
40.	<b>CPPS/CBE/PAT/MED/2016/001</b> Assessment of mycoflora and their toxins in medicinal plants and spice Products Dr. V. Paranidharan, Prof. (Pl. Path.), TNAU, Coimbatore <b>Period:</b> March 2016 to January 2019	The project may be continued up to July 2019. The findings may be given for information.
<b>V. Flower crops</b>		
<b>Nematology</b>		
41.	<b>ACRI/TRY/NEM/FLO/2014/001</b> Eco-friendly approaches for the management of root knot nematode in tuberose. <b>Period:</b> June 2014 -May 2017 Dr. T. Senthilkumar, Asst. Prof. (Nem.) ADAC &RI, Trichy	Since the project duration is over, completion report needs to be submitted on or before 30.06.2019.

## D. **TECHNOLOGIES FOR ADOPTION**

### **1. Mango Fruit Fly Trapping Technology**

Mass trapping of fruit flies @25 traps/ha during March - June (Main season) and August - November (Off season) reduced fruit fly incidence by 50% with savings upto Rs. 10,500/ha on plant protection chemicals.

### **2. Chemical management of tomato early blight caused by *Alternaria solani***

Application of propiconazole (0.1%) or hexaconazole (0.1%) on 30 and 50 days after planting was found to be effective in controlling early blight of tomato besides increasing fruit yield.

### **3. Management of root knot nematode *Meloidogyne hapla* in carrot**

Incorporation of mustard plants followed by application of neem cake @ 250 kg/ha along with *Purpureocillium lilacinum* @ 5 kg/ha significantly reduced the root knot nematode, *M.hapla* population by 47.08% and increased the carrot yield by 28.1% compared to untreated control.

### **4. Biointensive Integrated Pest Management module for curry leaf**

Integrated management package for psyllids and leaf roller in curry leaves was found effective. The components are

- Yellow sticky traps (30 X 15 cm) @ 50 ha<sup>-1</sup> for psyllids
- Light trap @ 1 ha<sup>-1</sup> for monitoring leaf roller moths
- Release of *Trichogramma chilonis* @ 5cc ha<sup>-1</sup> (2 releases at 35 and 50 days after pruning (DAP), *Chrysoperla zastrowi sillemi* @ 10,000 eggs ha<sup>-1</sup> (two releases at 40 and 55 DAP) to manage leaf roller.
- Use of NSKE 2.5% + mineral oil 0.25%, to manage psyllids and leaf roller
- Need based application:
- For psyllid : Thiamethoxam 25 WG @ 25 g a.i. ha<sup>-1</sup>
- For leaf roller: Chlorantraniliprole 18.5 SC @ 30 g a.i. ha<sup>-1</sup>
- Border cropping /intercropping with sorghum or cowpea to conserve natural enemies

## **5. Biological management of rhizome rot in ginger**

Rhizome dip in *Pseudomonas fluorescens* (0.1%) for 30 minutes along with soil application of *P. fluorescens* @ 2.5 kg/ha on 3, 5 and 7<sup>th</sup> months after planting was effective in the management of rhizome rot in ginger

## **6. Management of root knot nematode, *Meloidogyne incognita* in tuberose**

Application of *Pochonia chlamydosporia* as bulb treatment @ 1 kg/ha followed by soil application @ 2.5 kg/ha mixed with FYM significantly reduced the gall index of 1.3 and increased flower yield (by 46.34%) with a CB ratio of 1 : 2.75 compared with untreated control.

### **FOR ON-FARM TRIAL**

#### **OFT 1. Seasonal Incidence and intergraded management of citrus leaf mite (*Panonychus citri*)**

##### **Treatments proposed:**

T1-Basil Leaf extract @ 5%

T2-Citrus Fruit extract @ 5%

T3-Vitex Leaf extract @ 5%

T4: Propargite @2ml/l

T5:Untreated check

(T1-T3 are ethanolic extracts: Madurai centre will supply ethanolic extracts to all centres)

Design: RBD; Replications: 4 Variety: Local

Plot size: 3 trees/replications

##### **Observations to be recorded:**

No of mites/leaf from all 4 directions of the trees (20 leaves/tree)

No of eggs/leaf from all 4 directions of the trees (20 leaves/tree)

Phytotoxicity symptom on the leaf

Natural enemies' activity

Fruit yield/tree and CB ratio

**Coordinating Centre:** AC&RI, Madurai (Dr. C. Chiniah, Professor (Entomology))

##### **Participating Centres:**

TNAU, Coimbatore (Dr. R. Vishnupriya, Professor (Entomology))

CRS, Sankarankovil (Dr. Elanchezhiyan, Asst. Prof. (Entomology) from AC&RI, Kilikulam)

HC&RI, Trichy (Dr. R.P. Soundarrajan, Assoc. Prof. (Entomology))

## **OFT 2. Management of tea mosquito bug in Guava**

### **Treatments proposed:**

- T1-*Beauveria bassiana* (CFU  $1 \times 10^8$ ) @1 gm/litre (3 rounds of spray after noticing initial incidence at 15 days interval)
- T2-Profenophos 50 EC @ 1.5 ml/litre (3 rounds of spray after noticing incidence at 15 days interval)
- T3- Untreated check

**Design:** RBD; Replications: 7

### **Observation to be recorded:**

Fruits damage, weight of healthy and damaged fruits

Yield (kg/tree) and BC ratio

**Coordinating Centre:** RRS, Virudhachalam (Dr. S. Jeyaprabhavathi, Asst.Prof. (Entomology))

### **Participating Centers:**

HC&RI, Periyakulam (Dr. S. Irulandi, Asst. Prof. (Entomology))

AC&RI, Madurai (Dr. K. Suresh, Asst. Prof. (Entomology))

AC&RI, Vazhvachanur (Dr. Y.S. Johnson Thangaraj Edward, Professor (Entomology))

HC&RI (W), Trichy (Dr. M. Chandrasekaran, Asst. Prof. (Entomology))

## **OFT 3. Evaluation of Entomopathogenic Nematodes (EPNs) bacterial toxins against brinjal insect pests**

### **Treatments Proposed:**

T<sub>1</sub>- EPN bacterial toxin formulation @ 1ml/lit (to be repeated thrice 30,60 and 90 DAT)

T<sub>2</sub>- Farmers practice

T<sub>3</sub>- Untreated check

Design : RBD, Replications : 7, Variety: Ruling variety

### **Observations to be recorded:**

- Per cent damage of shoot and fruit borer and population of mealy bug, white fly, aphids, leaf hopper and *Epilachna* beetle,
- Yield (Kg/ha), Benefit cost ratio.

**Coordinating centre:** HC &RI, Periyakulam (Dr. S. Prabhu, Asst. Prof. (Nematology))

### **Participating centers:**

AC &RI, Coimbatore (Dr. E. Sumathi, Asso. Prof. (Entomology))

AC &RI, Madurai (Dr. K. Suresh, Asst. Prof. (Entomology))

HC &RI, Periyakulam (Dr. S. Irulandi, Asst. Prof. (Entomology))

AC &RI, Killikulam (Dr. G. Preetha, Asst. Prof. (Entomology))



#### **OFT 4. Management of red spidermites in Betelvine**

##### **Treatments proposed:**

T1-Foliar application of azadirachtin 10,000 ppm @ 1ml/lit of water followed by neem seed kernel extract 5 per cent after 15 days

T2-Farmers practice – propargite 2ml/lit of water

T3- Untreated check

**Design:** RBD; Replications: 7

##### **Observation to be recorded:**

Number of mites/25 leaves (five leaves/vine, 5 vines /replication)

Leaf yield, C:B ratio

Organoleptic test

**Coordinating centre:** TNAU, Coimbatore (Dr. T.Elaiyabharathi, Asst.Prof.(Entomology)

##### **Participating Centres:**

HC&RI, Periyakulam (Dr. M.Kannan, Asst.Prof.(Entomology)

ARS, Bhavanisagar (Dr. Sheela Venugopal, Asst.Prof.(Entomology)

ADAC&RI, Trichy (Dr. Sheeba Joyce Rosleen, Asst.Prof.(Entomology)

PHTC, TNAU, Coimbatore (Dr. G. Guru Meenakshi, Assoc.Prof. (Food Processing)

#### **OFT 5. Management of gummosis and die-back of mango**

##### **Treatments proposed:**

T1 – Removal of infected twigs and branches + three sprays of tebuconazole 25EC (0.1%) at 15 days interval

T2 - Farmers Practice-Three sprays of thiophanate methyl 70 WP (0.1%) at 15 days interval

T3 - Untreated check

- First spray at first fortnight of December

**Design:** RBD; Replications: 7, Variety: Bangalora

##### **Observation to be recorded:**

- Gummosis/die-back incidence (PDI)
- Fruit Yield (t/ha) and BC ratio

**Coordinating Centre:** TNAU, Coimbatore (Dr. T. Anand, Asst. Prof.(Plant Pathology)

**Participating Centres:**

TNAU, Coimbatore (Dr. S. K. Manoranjitham, Assoc. Prof (Pl. Patho) /

Dr. T. Anand, Asst. Prof. (Plant Pathology)

RRS, Paiyur (Dr. N. Indra, Asst. Prof. (Plant Pathology)

HC&RI, Periyakulam, (Dr. K. Manonmani, Asst. Prof.(Plant Pathology)

**OFT 6. Integrated management of citrus greening disease**

**Treatments proposed:**

T1 - 50% more than recommended dose of Phosphorus (RDP) + Tetracycline hydrochloride 600ppm + ZnSO<sub>4</sub> + FeSO<sub>4</sub> (200g each/tree)

T2 - Farmers practice – Tetracycline hydrochloride 500ppm

T3 - Untreated control

**Design:** RBD; Replications: 7

**Observations to be recorded:**

- Disease Incidence
- Fruit yield per plant
- C:B ratio

**Coordinating Centre :** HC&RI, Periyakulam (Dr. K. Manonmani, Asst. Prof. (Pl. Path.)

**Participating Centres :**

HC&RI, Periyakulam, Dr. K. Manonmani, Asst. Prof. (Pl. Path.)

HRS, Thadiyankudisai, Dr. K. Manonmani, Asst. Prof. (Pl. Path.)

CRS, Sankarankoil, Dr. Ram Jagadeesh, Asst. Prof. (Pl. Path.)

**OFT 7: Management of root knot nematode, *Meloidogyne enterolobii* in guava**

**Treatments proposed:**

T1 - *Purpureocillium lilacinum* @ 75g mixed with FYM @ 2.5kg, pressmud @ 2.5kg, neem cake @

125g/tree with marigold around tree basin

T2 - Farmers practice (carbofuran3G @ 60g/tree)

Design : Paired 'T' test, Replications : 14, Variety: L -49

**Observations to be recorded:**

- Initial and final nematode population soil (200cc) and root (5g) & No. of galls/ 5g root, No. of fruits / tree, Fruit weight (g),
- Yield: Kg/tree;
- C:B ratio.

**Coordinating centre:** HC &RI, TNAU, CBE (Dr. P.Vetrivelkai, Asst. Prof. (Nematology))

**Participating centres:**

AC &RI, Coimbatore (Dr. P.Kalaiarasan, Asst. Prof. (Nematology))

HC &RI, Periyakulam (Dr. S. Prabhu, Asst. Prof. (Nematology))

AC &RI, Vazhavachanur (Dr. P. Senthilkumar, Asst. Prof. (Nematology))

**OFT 8. Development of eco-friendly bioformulation for the management of chilli anthracnose****Treatments proposed:**

T1 - Thyme oil 5EC -1 %

T2 - Farmers practice - Carbendazim - 0.1%

T3 - Untreated control

Design: RBD; Replications: 7

**Observation to be recorded:**

- Percent Disease Index
- Yield
- C:B ratio

**Coordinating Centre :** TNAU, Coimbatore (Dr. A. Kamalakannan, Professor (Plant

Pathology) **Participating Centres:** TNAU, Coimbatore (Dr. M. Karthikeyan, Asst. Prof. (Plant Pathology))

RRS, Arupukottai (Dr. P. Mareeswari, Asst. Prof. (Plant Pathology))

AC&RI, Killikulam (Dr. N.Rajinimala, Asst. Prof. (Plant Pathology))

HC&RI, Periyakulam (Dr. K. Manonmani, Asst. Prof. (Plant Pathology))

**OFT 9: Biomangement of root knot nematode, *Meloidogyne incognita* on tomato****Treatments proposed:**

T<sub>1</sub> – *Purpureocillium lilacinum* @ 2.5Kg/ha mixed with FYM @ 250Kg/ha at the time of transplanting

T<sub>2</sub> - Farmers practice (Carbofuran 3G @ 1kg ai/ha)

Design : Paired 'T' test , Replications: 15, Variety: Co.3

**Observations to be recorded:**

- Nematode population in soil (200 cc) and root (5g),
- Root knot Index,
- Yield (t/ha)
- C:B ratio

**Coordinating centre :** TNAU, CBE (Dr. A.Shanthi, Professor (Nematology))

**Participating Centres:**

HC &RI, Periyakulam (Dr. S. Prabhu, Asst. Prof. (Nematology))

AC &RI, Trichy (Dr. P. Jayakumar, Asst. Prof. (Nematology))

VRS, Palur (Dr. K. Senthamizh, Asst. Prof. (Nematology))

**OFT10. Overall package for nematode management of root knot nematode, *Meloidogyne incognita* infesting cucumber under protected cultivation (as large scale demo)**

**Treatments proposed:**

Step 1-Removal of root biomass from previous crop

Step 2-Soil solarisation of moistened soil using transparent polyethene sheets 25 micron thickness for a period of 2-3 weeks during peak summer (May-June).

Step 3-Incorporation of bio enriched farm yard manure/ vermicompost or both @ 1 ton per acre polyhouse ( $2 \times 10^8$  for *P.lilacinum*, *P.chlamydosporia* and *T.asperillum* and  $2 \times 10^{12}$  for *P.fluorescens*). The FYM heap has to be moistened, mixed with bioagents and kept for 3-4 weeks in shade (mixing and moistening once in a week).

Step-4-Crop rotation (Cucumber to be rotated with more tolerant host, capsicum followed by good host tomato/ cucumber).

Step 5. New molecule (Fluopyram 400SC) @ 250g a.i/ha at One day after transplanting and 25 DAT can be demonstrated through drip.

Step-6. Drip application of liquid formulation of *Pochonia chlamydosporia* @ 0.25 ml/ m<sup>2</sup> (at the time of sowing to be repeated thrice at monthly intervals -30,60 and 90 DAS).

Design : RBD; Replications: 7 Variety : Ruling Variety

**Observations to be recorded:**

Nematode population in soil (200 cc) and root (5 g), Root knot Index

Yield (Kg/m<sup>2</sup>) and converted into t/ha,

C:B ratio

**Coordinating centre :** TNAU, CBE (Dr. N.Swarnakumari, Asst.Professor (Nematology))

**Proposed centers:**

AC &RI, Coimbatore (Dr. P. Kalaiarasan, Asst. Prof. (Nematology))

AC &RI, Coimbatore (Dr. G. Jothi, Assoc. Prof. (Nematology))

AC &RI, Vazhavachanur (Dr. P. Senthikumar, Asst. Prof. (Nematology))

## **OFT 11. Management of leaf blight in coconut**

### **Treatments proposed:**

T<sub>1</sub> – Root feeding with Tebuconazole @ 5 ml in 100 ml of water during Jan, April, July and October.

T<sub>2</sub> – Root feeding with Hexaconazole @ 2 ml in 100 ml of water during Jan, April, July and October.

T<sub>3</sub> – Root feeding with Carbendazim @ 2 g in 100 ml of water during Jan, April, July and October.

T<sub>4</sub> – Control

**Design** : RBD ; Replications: 5 (3 palms / replication)

### **Observations to be recorded:**

- Leaf blight incidence
- Nut Yield
- Residue analysis
- BC ratio

**Coordinating centre:** TNAU, CBE (Dr. E. Rajeswari, Assoc. Prof. (Plant Pathology), CRS, Aliyar nagar  
Dr.A.Suganthi, Asst.Prof. (Entomology), TNAU, Coimbatore

### **Participating centres:**

CRS, Veppankulam (Dr. M. Surulirajan, Asst. Prof. (Plant Pathology)

CRS, Aliyar nagar (Dr. E. Rajeswari, Assoc. Prof. (Plant Pathology)

### **FOR INFORMATION**

#### **1. Management of Citrus Leaf mite, *Panonychus citri***

- Foliar application of 3 rounds of neem oil 3 % at 15 days interval is effective against citrus leaf mite followed by citrus peel oil 3 % and citronella oil @ 3 %.
- Foliar application of 3 rounds of fenpyroximate 5EC @1.0 ml/lit and spiromesifen 22.9 SC @ 0.75 ml/lit are effective against the leaf mite

**2. A new low cost banana pulp fruit fly trap:** Food bait placed in indigenously developed (Rs.11/no.) trap @ 20g banana pulp/ trap attracts cucurbit fruit fly effectively (131 adults/ trap/ day).

#### **3. Protease inhibitors from plant sources for pest management**

- *Spodoptera litura* larvae fed with *Adenantha pavonina* (Red lucky seed) trypsin inhibitor (ApTI) + *Momordica charantia* trypsin inhibitor (McTI) (1:1) exhibited
  - weight reduction in larval (73.56%), pupal (53.67%) and adult (61.64%) stages
  - Prolonged larval and pupal duration and reduced adult life span

- Caused malformations in larva pupa and adult
- *Zinziber officinale* rhizome and *Momordica balsamina* seeds were found to possess trypsin inhibitory activity

#### **4. Influence of weather parameters on tea mosquito bug (TMB), leaf and blossom webber in cashew**

- Sunshine (hours) and max. temperature (°C) were positively correlated with TMB population
- Rainfall and rainy days were negatively correlated with TMB population
- Rainfall was negatively correlated with leaf and blossom webber damage

#### **5. Banker crops for Coconut Rugose Spiralling Whitefly management**

- *Annona muricata*, *Annona reticulata*, *Musa paradisiaca*, *Theobroma cocoa* housed higher numbers of encyrtid parasitoid *Encarsia guadeloupae*

#### **6. Mahaffee spore trap for detection of airborne inoculum of grapevine mildews**

- A low cost impaction spore trap was designed to detect air borne inocula of grape vine downy mildew.
  - A rapid highly sensitive detection technique, Loop Mediated Isothermal amplification Assay (LAMP) was developed for the detection of air borne inocula of grapevine downy mildew

#### **7. Characterization of FOC races associated with Banana Var. Grand Naine**

- Absence of FOC TR4 race in Tamil Nadu was confirmed by Polymerase chain Reaction with race 4 specific primer

#### **8. Antifungal efficacy of bacterial endophytes – *Brachybacterium paraconglomeratum* of banana against FOC– Race 1**

- Bacterial endophyte *B.paraconglomeratum* was effective in the suppression of FOC-Race 1
- Biomolecules produced by *B.paraconglomeratum* at the zone of inhibition were identified as valeric acid, clindamycin, phosphorothioic acid and 3ODeoxy-d-mannonic lactone.
- Scanning electron microscopic studies confirmed that bacterial endophytes *B. paraconglomeratum* colonized the rhizoplane, pseudostem and petiole. Besides, improved the root architecture.

#### **9. Endophytic bacteria against *Meloidogyne enterolobii***

Endophytic bacteria viz., *Bacillus subtilis* and *B.amyloliquifaciens* reduced the egg hatching and juvenile mortality of *M. enterolobii* and growth of *Fusarium oxysporum*. The compounds eluted from inhibition zone revealed hexadecanoic and vaccenic acid to be having antifungal and nematicidal properties.

#### **10. Management of root knot nematode, *M.enterolobii* by non host, trap crop and repellent plants around the basin of guava**

Marigold, sunnhemp, onion and garlic were found to have repelling effects on root knot nematode, *M.enterolobii* when planted as basin crops in guava, while cowpea was found to be a good host and can be used as trap crop.

#### **11. New record of root knot nematode, *Meloidogyne arenaria* & *M.incognita* in mango**

Root knot nematode identified as *Meloidogyne incognita* and *M.arenaria* were observed in mango varieties surveyed in mango growing districts of Tamil Nadu. The cross section of

infested roots showed females lodged in cortex with giant feeding cells. This is a new record from Tamil Nadu.

**12. New record of root knot nematode, *Meloidogyne indica* in citrus var. Balaji – Coimbatore and Erode districts**

Stunted and chlorotic citrus plants var. Balaji when examined were found to lodge several females of root knot nematode which was identified as *M.indica* by morphological means. The galls were oblong in shape and many times roots were symptomless. This is a new record from Tamil Nadu.

**13. MAMP triggered immunity mediated through *Bacillus amyloliquefaciens* for the management of bud necrosis virus in tomato**

- MAMP clones with Flagellin and Elongation factor triggered the expression of MAPKKK1, transcription factor WRKY33 and the defense genes NPR1, PR1 responsible for ISR and suppressed the viral infection up to 63% .
- Biomolecules pentadecenoic acid, heptadecenoic acid, octadecenoic acid, pyrrolo, piperazinedione and tetradecenoic acid suppressed the symptom expression in the bud necrosis virus inoculated tomato plants.

**14. A new seed transmissible Bittergourd yellow mosaic virus (BgYMV)**

- Disease incidence ranged from 58 to 76%.
- Virus is identified as a new recombinant virus and named as Bittergourd yellow mosaic virus.
- BgYMV was sap transmitted to bitter gourd and whitefly transmitted to bitter gourd and ridge gourd.
- Virus is seed borne and seed transmitted.

**15. Management of virus diseases in snake gourd**

- Basal soil application of micronutrient mixture @ 2.5kg / ha each ferrous sulphate, zinc sulphate, copper sulphate, manganese sulphate and borax along with foliar application of micronutrient mixture (0.2 per cent of each ferrous sulphate, zinc sulphate, copper sulphate, manganese sulphate and 0.1 per cent borax) was found to be effective in reducing the virus disease incidence in snake gourd.

**16. Genetic diversity of GBNV infecting tomato and RNAi constructs for GBNV**

- There was no diversity among the GBNV isolates collected from different locations of Tamil Nadu.
- RNAi constructs targeting coat protein and replicase of GBNV are available

**17. Occurrence of Bittergourd - Cucurbit aphid - borne yellows virus (Polerovirus) in Coimbatore district**

**18. Inspection of Polyhouses for Plant Parasitic Nematodes**

A preliminary survey -has been carried out for occurrence of plant parasitic nematodes in polyhouse grown crops in Thally, Denkanikottai Taluk, Krishnagiri district of Tamil Nadu. Major nematode associated with Root Knot Nematode, *M. incognita*.

**19. New record of Little leaf of *Solanum trilobatum*, *Candidatus* Phytoplasma**

20. Emerging virus disease of liliium - *Plantago asiatica mosaic virus in liliium* was observed.
21. New record of Jasmine Rust – *Puccinia urticae* noticed in Coimbatore district
22. Emergence of *Tobacco streak virus* infecting Anthurium var. Medioria Red was recorded



#### D. Action plan (2019 -2020)

##### Theme Area:

1. Screening of germplasm and mechanism of resistance
2. Pesticide dynamics in horticultural crops
3. Pest, diseases and nematodes management in open/ protected cultivation
4. Invasive insect pests / diseases / nematodes monitoring

##### Theme 1: Screening of germplasm and mechanism of resistance

Action plan	Name of the Scientist and Centre	Activities (2019-20)	Deliverable/ expected outcome
Screening of bhendi entries/varieties against bhendi fruit borer (CONTINUED)	Dr. M.Chandrasekaran HC&RI (W), Trichy	Screening pre-release cultures obtained from the breeders under natural and artificial condition as per the standard screening methods and resistance levels Observations on the incidence of pests (sucking pests and fruit borers) under field screening and recording biochemical and biophysical	Identification of resistant donors Mechanism of resistance Integration in resistance breeding programmes
Evaluation of silicon induced resistance against pests of brinjal (NEW)	Dr. E. Sumathi Assoc. Prof. (Ento), TNAU, CBE	Identification of effective silicon sources for induced resistance in Brinjal against major pests Identification of mechanisms involved in induced resistance Observations on sucking and fruit and shoot borer population Pests population, Damage Yield and CB ratio	Dose of silicon

Screening of brinjal, tomato and bhendi accessions/ germplasms	Dr. K. Senthamizh , Asst. Prof. (Nematology) VRS, Palur Dr. P.Kalaiarasan, Asst. Prof. (Nematology) TNAU, Coimbatore	Screening of brinjal, tomato and bhendi accessions/ germplasms against root knot nematode will be continued under artificially inoculated conditions.	Identification of resistant sources
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## Theme 2: Pesticide dynamics in horticultural crops

Action Plan	Scientist in charge and Centre	Activities (2019-20)	Deliverable/ expected outcome
Monitoring of Pesticide residues	Dr. K. Bhuvaneshwari Prof. (Ento), Dept.of Entomology, TNAU, CBE  Dr.M.Paramasivam, Asst. Professor (SS&AC), Dept.of Entomology, TNAU, CBE  Dr.A.Suganthi Asst.Prof. (Ento.), Dept.of Entomology,TNAU, CBE	Collection of fruits, vegetables, spices from Tirupur, Pollachi, Pudukottai Sathyamangalam, and Karur and Tea from Kotagiri for residue analysis	Data on pesticide residue

Mitigating pesticide residue problem in curry leaf (CONTINUED)	Dr.K.Bhuvanewari Professor (Ento.), Dept.of Entomology, TNAU, CBE  Dr.S.Sridharan, Professor (Ento.), Dept.of Entomology,TNAU, CBE  Dr.A.Suganthi , Asst.Professor (Ento.), TNAU, CBE	Demonstration of IPM package in Puliyankudi belt  Conducting meetings / awareness training programmes on BIPM module and safe use of pesticides in major curry leaf growing areas of Tamil Nadu	Awareness among curry leaf farmers on IPM  Reduction in pesticide usage and pesticide free produce
Dissipation pattern of insecticides applied on tomato production system	Dr. B. Vinothkumar Asst. Prof.(Ento), Dept.of Entomology, TNAU, CBE	Dissipation pattern of major insecticides used in tomato  Observations to be recorded  Method validation will be	Dissipation pattern, half life and waiting period of commonly used insecticides will be assessed.

### Theme 3: Pest, diseases and nematodes management in open/ protected cultivation

Action Plan	Name of the Scientist and Centre	Activities (2019-20)	Deliverable/ expected outcome
Development of Integrated Management practices for anthracnose disease in mango	Dr. K. Manonmani, Asst. Prof. (Pl. Path.), Department of Fruit Crops, HC &RI,Periyakulam	Evaluation of biocontrol agents and fungicide molecules against anthracnose disease under field condition  Observations to be recorded <ul style="list-style-type: none"> <li>• Disease incidence</li> <li>• Fruit yield</li> <li>• BC Ratio</li> </ul>	Effective management package for managing the Mango anthracnose disease under field condition.

<p>Identification of pathogens and management of fruit rot diseases in manila tamarind and custard apple Monitoring of pests</p>	<p>Dr. P. Mareeswari, Asst. Prof. (Pl. Path.), RRS, Aruppukottai Dr. D.S. Rajavel Professor and Head, RRS, Aruppukottai</p>	<p>Evaluation of biocontrol agents and new fungicide molecules against fruit rot diseases under lab and field condition Observations to be recorded</p> <ul style="list-style-type: none"> <li>▪ Pest and Disease incidence</li> <li>▪ Fruit yield</li> </ul>	<p>Effective management package for managing the fruit rot diseases of manila tamarind and custard apple under field condition will be available.</p>
<p>Nematode management through biocontrol agents in fruit crops</p>	<p>Dr. P. Vetrivelkai Asst. Prof. (Nem.) HC &amp; RI, Coimbatore Dr. N. Seenivasan Assoc. Prof. (Nem.) AC &amp; RI, Madurai</p>	<p>Bio-management of nematode in guava, banana and citrus <b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>▪ Initial and final nematode population soil (200cc) and root (5g) &amp; No. of galls/ 5g root,</li> <li>▪ Fruit yield / tree, CB ratio.</li> </ul>	<p>Development of effective delivery method for nematode management.</p>
<p>Testing of newer chemical nematicides against nematodes</p>	<p>Dr. P.Kalaiarasan Asst. Prof. (Nem.) Dr. N. Swarnakumari Asst. Prof. (Nem.) TNAU, Coimbatore</p>	<p>Nematode management using newer nematicides in guava <b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>▪ Initial and final nematode population soil (200cc) and root (5g) &amp; No. of galls/ 5g root,</li> <li>▪ Fruit yield / tree, CB ratio.</li> </ul>	<p>Identification of newer nematicides for nematode management</p>

<p>Consortium of PGPR , growth hormone and Micronutrients will be formulated for managing root knot nematode, <i>M. enterolobii</i></p>	<p>Dr. K. Poornima Prof. &amp; Head (Nem.) Dr. P.Jeyakumar Prof. &amp; Head (CRP) Dr. P. Vetrivelkai Asst. Prof. (Nem.) Dr.S.K.Manoranjitham Assoc. Prof. (Pl. Patho.) Dr. D. Vidya, Asst. Prof. (Hort.) TNAU, CBE</p>	<p>Standardization of foliar spray of MN mixture and spot application of consortium of PGPR and organic amendments</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Shoot and root growth</li> <li>• Nematode population in 200 cc soil and 5g root</li> <li>• No.of galls /5g root</li> </ul>	<p>Rejuvenation and sustenance of yield in nematode infested guava orchards.</p>
<p>Bio-ecology and management of tea mosquito bug, <i>Helopeltis</i> spp. (Heteroptera: Miridae) in Moringa eco-system</p>	<p>Dr.K.Suresh, Asst.Prof. (Ento), AC&amp;RI, Madurai</p> <p>Dr.M.Kannan, Asst.Prof. (Ento), HC&amp;RI, Periyakulam</p> <p>Dr.T.Elaiyabharathi, Asst.Prof. (Ento), HC&amp;RI, Coimbatore</p>	<p>Evaluation of botanicals and bio-pesticides for the management of tea mosquito bug in moringa</p> <p>Evaluation of efficacy of new insecticides molecule against tea mosquito bug in moringa</p> <p><b>Observations to be recorded</b></p> <p>Population dynamics of TMB in moringa and other hosts correlated with weather parameters</p> <p>Population of TMB, Shoot damage (%) and Natural enemies</p> <p>Yield and C:B ratio</p>	<p>Effective botanical or biopesticide will be identified for the management of TMB in moringa</p> <p>Effective new insecticide molecule with effective dose will be identified</p>

<p>Nano formulation for controlled release of parapheromone (cuelure) to manage fruit flies in cucurbits</p>	<p>Dr. M. Kannan Asst. Professor (Agrl. Ento.) HC &amp; RI, Periyakulam</p>	<p>Synthesis and characterization of nano parapheromones formulations to trap fruit flies in cucurbits</p> <p><b>Observations to be recorded</b></p> <p>Field evaluation of nano parapheromone formulations for effective monitoring and mass trapping of fruit flies in cucurbits</p>	<p>Effective mass trapping method Correct timing of pest management strategies</p>
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<p>Characterization of FOC race associated with banana Var. Grand Naine</p>	<p>Dr. A.Kamalakaran, Professor, Department of Plant Pathology, TNAU, Coimbatore</p> <p>Dr. K. Manonmani, Asst. Prof. (Pl. Path.), Department of Fruit Crops,</p>	<p>Race level identification of FOC by using VCG analysis and volatile spectrum analysis</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>- Monitoring of TR4 race in TN</li> <li>- VCG analysis</li> <li>- Risk Assessment</li> </ul>	<p>Monitoring of movement of TR 4 race of FOC in Tamil Nadu</p>
<p>Documentation and molecular characterisation of whitefly species complex of vegetables in Tamil Nadu</p>	<p>Dr. S. Mohankumar Director, CPMB</p> <p>Dr. M. Murugan Prof (Ento)</p> <p>Dr. V.Balasubramani Prof (Ento)</p> <p>Dr.S.Jeyarani Prof (Ento)</p>	<p>Collection of whitefly species from seven agro ecological zones of Tamil Nadu in horticultural crops.</p> <p>Taxonomic and molecular characterization</p> <p><b>Observations to be recorded</b></p> <p>Percent whitefly incidence</p>	<p>Identification and establishment of whitefly species complex</p>

	<p>Dr.N.Chitra Asso. Prof (Ento) Dr.T.Elaiyabharathi, Asst Prof (Ento)</p>	<p>Disease expression (if any) Relative abundance of whitefly species Morphological confirmation based on taxonomic key Molecular confirmation through mt COI</p>	
<p>Documentation and molecular characterisation of Thrips species complex of vegetables in Tamil Nadu</p>	<p>Dr. S. Mohankumar Director, CPMB Dr. M. Murugan, Prof (Ento) Dr. V. Balasubramani Prof (Ento) Dr.S.Jeyarani Prof (Ento) Dr. N. Chitra Asso. Prof (Ento) Dr. D. Rajabaskar Asst.Prof (Ento)</p>	<p>Collection of thrips species from seven agro ecological zones of Tamil Nadu in horticultural crops.  Taxonomic and molecular characterization <b>Observations to be recorded</b> Percent thrips incidence Disease expression (if any) Relative abundance of thrips species Morphological confirmation based on taxonomic key Molecular confirmation through mt COI</p>	<p>Identification and establishment of thrips species complex</p>

Development and validation of endospore based formulation of <i>Bacillus</i> sp. for the management of major soil borne diseases of tomato	Dr. S. Harish Asst. Professor (Pl.Path.) AC & RI, Madurai	Standardisation of endospore formulation and dosage optimisation for <i>Bacillus</i> .  Observations to be recorded  Efficacy and shelf life of formulations <ul style="list-style-type: none"> <li>- CFU of formulation at different intervals</li> <li>- Per cent diseases reduction</li> </ul>	Development of endospore-based formulation of <i>Bacillus</i> sp. for the management of major soil borne diseases of tomato
Organic management strategies to combat fusarial wilt and peanut bud necrosis virus disease in tomato	Dr. S.K.Manoranjitham Assistant Professor (Pl.Path), TNAU, CBE	Beneficial biocontrol <i>Bacillus subtilis</i> (PBC12) will be evaluated for fusarial wilt and bud necrosis disease in tomato.  Observations to be recorded <ul style="list-style-type: none"> <li>• Disease incidence (%)</li> <li>• Fruit yield (t/ha)</li> </ul>	Effective organic method of management for fusarial wilt and Peanut bud necrosis virus disease.
Documentation of viruses infecting brinjal and development of integrated disease management for viral and phytoplasma diseases	Dr. D. Dinakaran Professor and Head, ARS, Virinjipuram	Survey on the brinjal diseases and to study the extent of damage  Screening of newer insecticides and plant products for the management of insect vectors of viral and phytoplasma diseases of brinjal	Characterization and development of IDM module for the management of viruses in brinjal
	Dr. G. Karthikeyan Professor (Pl. Path.) TNAU, Coimbatore	Characterization of viruses infecting brinjal <ul style="list-style-type: none"> <li>- Molecular, serological and biological</li> </ul>	



	Dr. K. Kalpana Assistant Professor (Plant Pathology), AC& RI, Madurai	Field testing of bioagents , botanicals and insecticides for the management of virus disease complex affecting brinjal  <b>Observations to be recorded</b> <ul style="list-style-type: none"> <li>• Disease incidences (%)</li> <li>• Fruit yield (t/ha)</li> </ul>	
Management of major diseases of onion in rainfed region	Dr. P. Mareeswari, Assistant Prof. (Plant Pathology), RRS, Aruppukottai	Bioagents viz., <i>Bacillus</i> , <i>Pseudomonas</i> and <i>Trichoderma</i> along with recommended fungicide will be evaluated against major diseases – Basal rot, Purple blotch and twister blight  <b>Observations to be recorded</b> <ul style="list-style-type: none"> <li>- Disease severity (%)</li> <li>- Yield ( t/ha)</li> </ul>	Validated biocontrol packages will be made available to the farmers.
Integrated management of cassava mosaic disease in tapioca	Dr. M. Deivamani, Asst. Prof. (Pl. Pathology) Tapioca and Castor Research Station, Yethapur	Screening of newer insecticides, silica gel based nanoparticle and bio-products for the management of cassava mosaic disease of tapioca  <b>Observations to be recorded</b> <ul style="list-style-type: none"> <li>- Disease severity (%)</li> <li>- Yield ( t/ha)</li> </ul>	Validated IDM packages will be made available to the farmers.

Development of nematode management strategies under protected cultivation	<p>Dr. N.Swarnakumari Asst. Prof. (Nem.)</p> <p>Dr. P. Kalaiarasan Asst. Prof. (Nem.)</p> <p>TNAU, Coimbatore</p>	<ul style="list-style-type: none"> <li>• Evaluation of <i>P. chlamydosporia</i> oil based formulation against <i>M. incognita</i> on cucumber</li> <li>• Evolving INM module for the management of root knot nematode in cucumber</li> </ul> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (200 cc) and root (5 g), Root knot Index</li> <li>• Yield (Kg/m<sup>2</sup>), CB ratio</li> </ul>	Development of nematode management strategy for protected cultivation
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Nematode management in vegetable crops	<p>Dr. A. Shanthi, Professor (Nem.)</p> <p>Dr. G. Jothi Assoc. Prof. (Nem.)</p> <p>TNAU, Coimbatore</p> <p>Dr. K. Senthamizh Asst. Prof. (Nem.)</p> <p>VRS, Palur</p> <p>Dr. T. Senthilkumar Asst. Prof. (Nem.)</p> <p>HRS, Pechiparai</p>	<p>Biocontrol agents for the management of nematodes in tomato, cucumber, brinjal, and bhendi.</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (200 cc) and root (5g), Root knot Index</li> <li>• Yield (t/ha) and CB ratio</li> </ul>	Development of nematode management for vegetables under open field conditions.
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	<p>Dr. S.Prabhu Asst. Prof. (Nem.) HC &amp;RI, Periyakulam</p> <p>Dr. P.G Kavitha Asst. Prof. (Nem.) TNAU, Coimbatore</p>	<p>Botanicals for management of root knot nematode in tomato, brinjal and bhendi</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (200 cc) and root (5g), Root knot Index,</li> <li>• Yield (t/ha)</li> </ul>	
<p>Testing of newer chemical nematicides against root knot nematodes</p>	<p>Dr. P.Kalaiarasan Asst. Prof. (Nem.)</p> <p>Dr. N. Swarnakumari Asst. Prof. (Nem.) TNAU, Coimbatore</p>	<p>Nematode management using newer nematicides in tomato and cucumber</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (200 cc) and root (5g), Root knot Index,</li> <li>• Yield (t/ha)</li> </ul>	<p>Identification of newer nematicides for root knot nematode management</p>
<p>Nematode management in tuberose</p>	<p>Dr. P. Vetrivelkai Asst. Prof. (Nem.) HC &amp; RI, Coimbatore</p>	<p>INM module for the management of root knot nematode in tuberose</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (200 cc) and root (5g), Root knot Index,</li> <li>• Flower yield (g/plant)</li> <li>• Stalk length (cm)</li> </ul>	<p>Development of INM module for nematode management.</p>

<p>Studies on the population dynamics and management of Rugose spiralling whitefly, <i>Aleurodicus rugioperculatus</i> Martin in coconut</p>	<p>Dr. S.Jeyarajan Nelson, Prof (Ento)  Dr. S. Balakrishnan Prof.&amp; Head (Spices &amp; Pl.Crops)  Dr.Venkatesan, Prof &amp;Head, CRS, Aliyarnagar  Dr.V. G. Mathirajan, Asst.Prof. (Ento), CRS, Veppankulam  Dr. T. Srinivasan Asst. Prof. (Ento)  Dr.G.Preetha, Asst.prof. (Ento), AC&amp;RI, Killikulam  Dr. M.Alagar Assistant Prof.(Ento)  Dr. G. Srinivasan AC&amp;RI, Madurai</p>	<p>Assessing the yield loss caused by RSW in coconut  Validation of Integrated management strategies against RSWF in coconut  <b>Observations to be recorded</b>  No. of nuts, size of nuts, thickness of copra is to be compared in IPM and control plots  Correlation of weather factors with pest infestation  Identification of alternate host plants suitable for RSW to mass multiply parasitoid <i>Encarsia</i></p>	<p>Management strategies for Rugose spiralling whitefly  Conducting awareness training programmes on management of RSW in coconut</p>
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<p>Molecular characterization of coconut <i>Aleurodicus rugioperculatus</i> and <i>Encarsia guadeloupae</i></p>	<p>Dr. S. Jeyarajan Nelson Dr. N. Muthukrishnan AC&amp;RI, Coimbatore Dr. M. Alagar CRS, Aliyarnagar Dr. G. Preetha AC &amp;RI, Killikulam, Dr. S. Irulandi HC&amp;RI, Periyakulam Dr. G. Srinivasan AC&amp;RI, Madurai Dr. Chandrasekaran HC&amp;RI, Trichy, Dr. V.G. Mathirajan CRS, Veppankulam, Dr. Jeyaprabhavathi RRS, Virudhachalam</p>	<p>Collection of nymphs and adults of rugose spiralling whiteflies and parasitoids from coconut and sending to Department of Agrl. Entomology, TNAU, Coimbatore Observation to be recorded Incidence of RSW Morphological and molecular confirmation through mt COI</p>	<p>Confirmation of species/race identity of Tamil Nadu population</p>
<p>Integrated management of storage pests in Coriander</p>	<p>Dr. R. Arulprakash AC&amp;RI, Coimbatore</p>	<p>Externally funded project will be proposed</p>	<p>Ecofriendly management strategies</p>

IPDM capsule in cashew	<p>Dr. S. Jaya Prabhavathi, Asst.Prof. (Entomology)</p> <p>Dr. G. Senthilraja, Asst.Prof. (Plant Pathology)</p> <p>RRS, Vridhachalam</p>	<ol style="list-style-type: none"> <li>1. Prophylactic measure of removal of loose barks and swabbing the trunk with coal tar + kerosene @ 1: 2 ratio or neem oil 10% or lime 100 g/l to prevent egg laying of CSRB</li> <li>2. Swabbing of Bordeaux paste for gummosis</li> <li>3. Extraction of grubs in and around damaged portion (stem and root), scooping of soil and drenching with monocrotophos 36 SL or Profenophos 50 EC @ 30 ml/20 l followed by earthing up and soil application of phorate 10 G @ 100 g /tree for CSRB.</li> <li>4. Spray schedule viz., first spraying with monocrotophos 36 SL or Profenophos 50 EC @ 2 ml/l at flushing stage, second spraying with Lamda cyhalothrin 5 EC @ 1 ml/l at flowering and third spraying with Acephate 50 WP @ 2 g/l or Chlorpyriphos 20 EC @ 2.5 ml/lit. of water at fruit set stage for TMB and other foliar pests on need basis.</li> <li>5. Spraying Bordeaux mixture 1% after pruning for die-back.</li> </ol> <p><b>Observations to be recorded</b></p>	Effective IPDM capsule in cashew will be developed
Studies on the effect of Silicon on the control of Rhizome Rot, Leaf Blight and Leaf Blotch of Turmeric	<p>Dr. Sangeetha Panickar Professor (Path.) ARS, Bhavanisagar</p>	<p>Effect of different silicon sources will be tested against turmeric diseases</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Disease incidence (%)</li> <li>• Yield (kg)</li> </ul>	Potential Silicon source will be identified for management against turmeric diseases

<p>Studies on the management of storage pathogens in Coriander</p>	<p>Dr. S.Sundravadana Asst. Professor Plant Pathology, Dept of Spices and Plantation HC&amp;RI, (TNAU), Coimbatore</p>	<p>Isolation of pathogens from the coriander seeds in storage</p> <p><b>Management</b></p> <p>Pre harvest spray with safer fungicides and biocontrol agents.</p> <p>Screening of Botanicals for the management of storage pathogens.</p> <p><b>Observations to be recorded</b></p> <p>Identification of pathogen in coriander seed during storage</p> <p>Residue analysis</p>	<p>Effective Management measure for storage pathogens will be developed</p>
<p>Management of die back and gummosis diseases in Cashew</p>	<p>Dr. G.Senthilraja Asst. Professor Plant Pathology, RRS, Virudhachalam</p>	<p>Field testing of newer molecules of fungicides for the management of die back and gummosis in Cashew</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Disease incidence</li> <li>• Yield/ha</li> </ul>	<p>Effective management package for die back and gummosis diseases in Cashew will be developed</p>
<p>Nematode management in pepper</p>	<p>Dr. T. Senthilkumar Asst. Prof. (Nem.) HRS, Pechiparai</p>	<p>Biomangement of nematodes in pepper and medicinal coleus.</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (250 cc) and root (5g)</li> <li>• yield (kg/vine)</li> </ul>	<p>Potential biocontrol agents identified for the nematode management.</p>

<p><i>Bacillus</i> mediated management of root rot diseases of <i>Gloriosa superba</i></p>	<p>Dr.P.Muthulakshmi Assoc. Prof. (Pl. Path.), TNAU, Coimbatore</p>	<ul style="list-style-type: none"> <li>• Effective <i>Bacillus</i> sp. will be tested against root rot pathogens under pot culture conditions.</li> <li>• Development of suitable delivery system</li> </ul> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Disease incidence (%)</li> <li>• Tuber yield (kg).</li> <li>• Population dynamics of <i>Bacillus</i></li> </ul>	<p>Potential <i>Bacillus</i> sp. will be identified for management of root rot diseases of <i>Gloriosa superba</i></p>
<p>Assessment of mycoflora and mycotoxin contamination in medicinal plants and spice product</p>	<p>Dr. V. Paranidharan Professor (Plant Pathology), TNAU, Coimbatore</p>	<p>Impact of aflatoxin producing <i>Aspergillus</i> will be assessed in medicinal &amp; spice produce and quantification of aflatoxin content will be carried out by HPLC.</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>- Mycotoxin Contamination Level</li> <li>- Assessment of Mycoflora contamination</li> </ul>	<p>Impact of mycotoxin contamination in the medicinal plant and spice produce will be assessed.</p>
<p>Nematode management in medicinal coleus</p>	<p>Dr. N. Swarnakumari Ast. Prof. (Nem.) TNAU, Coimbatore</p>	<p>Biomangement of nematodes in medicinal coleus.</p> <p><b>Observations to be recorded</b></p> <ul style="list-style-type: none"> <li>• Nematode population in soil (200 cc) and root (5g), root knot index</li> <li>• yield (kg/vine)</li> </ul>	<p>Potential biocontrol agents identified for the nematode management.</p>



## IV Closing Remarks & Way Forward

### Vice Chancellor

Recommendations	Centre
Technical programs may be finalized with the share of 20% for basic research, 70% for farmers need based research, 10% for agro based industrial research needs	All centres
Focused research on developing Climate resilient varieties/drought mitigation technology may be included.	All centres
New Projects may be proposed on need based research on priority areas	All scientists
Publication strength may be improved	All scientists
One article should be published in high rated journals	Ph.D Students, All scientists
Collaborative Research Projects may be formulated in Horticultural crops to maintain Soil health	NRM & Dean (Hort.), All scientists
Importance may be given for research on dry land Horticulture	RRS - Aruppukottai and DARS Chettinad
Students strength may be utilized to rejuvenate the old and senile orchards in farmers field	Fruits Crops, CBE & PKM
The crops which require less water and nutrients may be identified and promoted	<ul style="list-style-type: none"> <li>• RRS, Aruppukottai</li> <li>• HRS, Thadiyankudisai for Subtropical Zone</li> <li>• HRS, Ooty, and Kodaikanal for Temperate Zone</li> <li>• TCRS, Yethapur and DARS, Chettinad for arid zone</li> </ul>
Possibility of mechanization may be explored in HDP of fruit crops	AEC & RI, Coimbatore.
IC number may be obtained for the available germplasm accessions as per the NBPGR norms in the active Germplasm sites (as per the Expert committee proceedings) identified for different crops.	Germplasm centers
Establishing Phytochemical laboratory at Dept. of Medicinal and Aromatic Plants, HC & RI, Coimbatore has to be expedited to strengthen the research activities of Medicinal Crops	Dept. of Medicinal and Aromatic Plants, HC & RI, Coimbatore

## VII. Participants

<b>Horticultural college and Research Institute, TNAU, Coimbatore</b>	
<b>Office of the Dean (Horticulture), HC&amp;RI, Coimbatore</b>	
1.	Dr. L. Pugalendhi, Dean (Horticulture)
2.	Dr. S. Subramanian, Professor (Horticulture)
3.	Dr. T. Sumathi, Asst. Professor (Horticulture)
<b>Department of Fruit Science, HC&amp;RI, Coimbatore</b>	
4.	Dr.P.Paramaguru, Professor and Head
5.	Dr.R.M.Vijayakumar, Professor (Horticulture)
6.	Dr.S.K.Manoranjitham,Asst.Professor (Pl. Path)
7.	Dr.C.Kavitha, Assistant Professor(Hort.)
8.	Dr.K.B.sujatha,Assistant Professor(Crop Physiol.)
9.	Dr.P.Vetrivelkali,Assistant Professor(Nem.)
10.	Dr.D.Vidhya, Assistant Professor (Hort.)
<b>Department of Vegetable Science, HC&amp;RI, Coimbatore</b>	
11.	Dr. Swarnapriya, Professor and Head
12.	Dr. T. Saraswathi. Professor (Hort.)
13.	Dr. A. Sankari, Associate Professor (Hort.)
14.	Dr. V. Rajshree, Associate Professor (Hort.)
15.	Dr. G.V. Rajalingam, Assistant Professor (Horticulture)
16.	Dr. H. Usha Nandhini Devi
17.	Dr. K. Shoba Thingalmanian, Asst Prof. (Horticulture)
18.	Dr. M. Karthikeyan, Assistant Professor (Pl. Path.)
19.	Dr. C. Thangamani, Asst. Professor (Horticulture)
20.	Dr. B. K. Savitha, Asst. Professor (Horticulture)
<b>Department of Spices and Plantation Crops, HC&amp;RI, Coimbatore</b>	
21.	Dr.S.Balakrishnan, Professor & Head
22.	Dr.N.Shoba, Professor (Hort.)
23.	Dr.A.Ramar, Professor (Hort.)
24.	Dr.M.Mohanalakshmi, Asst. Prof. (Hort.)
25.	Dr.B.Senthamizh Selvi, Asst. Prof. (Hort.)
26.	Dr.V.Jegadeeswari, Asst. Prof. (Hort.)
27.	Dr.S.Sundaravadana, AP(Patho.)
<b>Department of Floriculture and Landscape Architecture, HC&amp;RI, Coimbatore</b>	
28.	Dr.K.Rajamani, Professor & Head
29.	Dr.M.Ganga, Associate Professor (Hort.)
30.	Dr.P.Aruna, Assistant Professor (Hort.)
31.	Dr.S.P.Thamaraiselvi, Assistant Professor (Hort.)
32.	Dr. M. Velmurugan, Assistant Professor (Hort.)
33.	Dr.K.Hemaprabha, Assistant Professor (Bio.tech.)
<b>Department of Medicinal and Aromatic Plants, HC&amp;RI, Coimbatore</b>	
34.	Dr.J.Suresh, Professor (Hort.)
35.	Dr. L. Nalina, Associate Professor (Hort.)
36.	Dr.P.Muthulakshmi, Associate Professor (Pl. Path.)
37.	Dr.S.Padmapriya, Assistant Professor (Hort.)
38.	Dr. T. Elaiyabharathi, Assistant Professor (Agrl. Ento.)

<b>Directorate of Extension Education, Coimbatore</b>	
39.	Dr.M.Jawaharlal, DEE
<b>Controllorate of Examination, Coimbatore</b>	
40.	Dr.K.Soorinathasundaram, Controller of Examination
41.	Dr. M. Kavitha, Asst. Professor (Hort.)
<b>Directorate of ODL, Coimbatore</b>	
42.	Dr. M. Ananthan, Director of ODL
<b>College of Agricultural Technology, Theni</b>	
43.	Dr. M. Theradimani, Dean, CAT, Theni
<b>Horticultural Scientists in other Directorates</b>	
44.	Dr. I. Geetalakshmi, Asst. Professor (Hort.), AEC&RI, TNAU, Coimbatore
45.	Dr. S. Haripriya, Asst. Professor (Hort.), Dept. of Nano Science and Technology, TNAU, Coimbatore.
<b>Horticultural College &amp; Research Institute, Periyakulam</b>	
46.	Dr.T.Arumugam, Dean
47.	Dr. J. Rajangam, Prof. & Head (Fruit Crops)
48.	Dr. G. Janavi, Prof. & Head (Vegetable Crops)
49.	Dr. S. Muthulakshmi, Prof. & Head (Floriculture & Medicinal Plants)
50.	Dr. R. Sankaranarayanan, Professor (Hort.)
51.	Dr. V.A. Sathiyamurthy, Assoc. Prof. (Hort.)
52.	Dr. C. Subesh Ranjith Kumar, Assoc. Prof. (Hort.)
53.	Dr. M. Kavino, Asst. Prof. (Hort.)
54.	Dr. R. Chitra, Asst. Prof. (Hort.)
55.	Dr. R. Balakumbahan, Asst. Prof. (Hort)
56.	Dr. S. Muthuramalingam, Asst. Prof. (Hort)
57.	Dr. V. Premalakshmi, Asst. Prof. (Hort)
58.	Dr. P. Arul Arasu, Asst. Prof. (Hort)
59.	Dr. P. Geetharani, Prof. (SST)
60.	Dr. V. Vani, Asst. Prof. (HSC)
61.	Dr. S. Santha, Asst. Prof. (PBG)
62.	Dr. S. Irulandi, Asst. Prof. (Ag. Ento.)
63.	Dr. S. Prabhu, Asst. Prof. (Nema.)
64.	Dr. K. Manonmani, Asst. Prof. (Pl. Path.)
<b>HRS, Kodaikanal</b>	
65.	Dr. I. Muthuvel, Assoc. Prof. & Head
66.	Dr. M.I. Manivannan, Asst. Prof. (Hort.)
<b>HRS, Pechiparai</b>	
67.	Dr. A. Jaya Jasmine, Professor and Head
68.	Dr. T. Prabhu, Asst. Prof.(Hort.)
69.	Dr. T. Senthilkumar, Assistant Professor (Nematology), HRS, Pechiparai
<b>CRS, Sankarankovil</b>	
70.	Dr. P. Nainar, Prof. & Head
<b>HRS, Thadiyankudisai</b>	
71.	Dr.T.Thangaselvabai, Professor & Head
72.	Dr.K.Sundharaiya, Asst. Prof. (Hort)

<b>GRS, Theni</b>	
73.	Dr. S. Saraswathi, Prof. & Head
74.	Dr. A. Subbiah, Asst. Prof. (Hort.)
<b>FRS, Thovalai</b>	
75.	Dr. K.J. Prem Joshua, Prof. & Head
76.	Dr. G. Ashokkumar, Asst. Prof. (Hort.)
<b>RRS, Arupukottai</b>	
77.	Dr. D.S. Rajavel, Professor and Head
78.	Dr. K.R. Rajadurai, Assistant Professor (Hort.)
79.	Dr. P. Mareeswari, Asst. Prof. (Pl Pathology)
80.	Dr. J. Rajkumar, Asst. Prof. (CRP)
<b>Agricultural College &amp; Research Institute, Killikulam</b>	
81.	Dr. R. Arulmozhiyan, Prof. & Head
82.	Dr. C. Ravindran, Asst. Prof. (Hort.)
<b>Dept. of Horticulture, AC&amp;RI, Madurai</b>	
83.	Dr. A. Beulah, Assoc. Prof. (Hort.)
84.	Dr. M. Palanikumar, Asst. Prof. (Hort.)
<b>AC &amp;RI, Madurai</b>	
85.	Dr. J. Ramalingam, Prof and Head (Biotech)
86.	Dr. M. Shanthi, Professor and Head, Dept. of Agrl. Entomology
87.	Dr. J. Jayaraj, Professor (Agrl. Ento.)
88.	Dr. M. Murugan, Professor (Agrl. Ento.)
89.	Dr. C. Chinniah, Professor (Agrl. Entomology)
90.	Dr. K. Suresh, Asst. Professor (Agrl. Entomology)
91.	Dr. S. Harish, Asst. Prof. (Pl. Path.)
92.	Dr. K. Kalpana, Asst. Prof. (Pl. Path.)
<b>Horticultural College &amp; Research Institute for Women, Trichy</b>	
93.	Dr.D.Sarala Devi, Dean
94.	Dr. S. Parthiban, Prof. and Head, Dept. of Fruit Science
95.	Dr. V. Lakshmanan, Prof. and Head, Dept. of Vegetable Science
96.	Dr. S. Jeeva, Prof. and Head, Dept. of Flori & Landscape Architecture
97.	Dr. K. Rajappan, Professor (Pl. Path)
98.	Dr. J. Auxilia, Assoc. Prof. (Hort.)
99.	Dr. C. Indurani, Assoc. Prof. (Hort.)
100.	Dr. V.P. Shanthi, Asst. Prof. (Hort.)
101.	Dr. K. Kumanan, Asst. Professor (Hort.)
102.	Dr. R. Neelavathi, Asst. Professor (Hort.)
103.	Dr. M. Chandrasekaran, Asst. Professor (Entomology)
<b>ARS, Pattukottai</b>	
104.	Dr. M. Tamil Selvan, Assistant Professor (Horticulture)
<b>CRS, Veppankulam</b>	
105.	Dr. A. Karthikeyan, Prof. & Head
106.	Dr. R. Marimuthu, Professor (Agronomy)
107.	Dr. V.G. Mathirajan, Assistant Professor (Agrl. Entomology)
108.	Dr. K.S. Vijai Selvaraj, Asst. Prof. (Hort.)
109.	Dr. A. Selvarani, Asst. Prof. (Agronomy)
110.	Dr. M. Surulirajan, Assistant Professor (Plant Pathology)

<b>RRS, Vridhachalam</b>	
111.	Dr. S. Velmurugan, Asst. Prof. (Hort.)
112.	Dr. S. Jayaprabavathy, Asst. Prof. (Entomology)
113.	Dr. K. Karunanithi, Professor (Pl. Path.), RRS, Vridhachalam
<b>AC&amp;RI, Kudimiyamalai</b>	
114.	Dr. R. Jayavalli, Asst. Prof. (Hort.)
<b>VRS, Palur</b>	
115.	Dr. K. Nageswari, Professor and Head
116.	Dr. K. Senthamizh, Assistant Professor (Plant Nematology)
117.	Dr. S. Ganapathy, Assistant Professor (Plant Breeding and Genetics)
<b>Coconut Research Station, Aliyarnagar</b>	
118.	Dr. K. Venkatesan, Prof. & Head
119.	Dr. K. Rajamanickam, Prof. (Agrl. Entomology)
120.	Dr. V. Sivakumar, Asst. Prof. (Hort.)
121.	Dr. Alagar, Asst. Prof. (Agrl. Ento.)
122.	Dr. C. Sudhalakshmi, Asst. Prof. (SS&AC)
123.	Dr. C. Ushamalini, Associate Professor, CRS, Aliyarnagar
124.	Dr. E. Rajeswari, Asso. Professor (Pl. Patho), CRS, Aliyarnagar
<b>Horticultural Research Station, Yercaud</b>	
125.	Dr. S. Nanthakumar, Professor and Head
126.	Dr. S. Praneetha, Professor (Hort)
127.	Dr. M. Anand, Assistant Professor (Hort)
<b>Horticultural Research Station, Ooty</b>	
128.	Dr. D. Keisar Lourdusamy, Associate Professor and Head
129.	Dr. S. Karthikeyan, Asst. Prof. (Hort.)
<b>TCRS, Yethapur</b>	
130.	Dr. P.S. Kavitha, Asst. Prof. (Hort.)
131.	Dr. M.K. Kalarani, Professor (CRP)
132.	Dr. M. Deivamani, Asst. Professor (Pl. Pathology)
<b>RRS, Paiyur</b>	
133.	Dr. L. Jeevajoithi, Prof. (Hort.)
134.	Dr. S. Mohamed Jalaluddin, Professor, (Agricultural Entomology)
135.	Dr. S. Srividhya, Asst. Prof. (Hort.)
136.	Dr. N. Indhra, Assistant Professor (Plant Pathology)
<b>ARS, Bhavanisagar</b>	
137.	Dr.N.K.Prabhakaran, Professor and Head
138.	Dr. Sangeetha Panicker, Professor (Plant Pathology)
<b>Department of Sustainable Organic Agriculture, TNAU, CBE</b>	
139.	Dr. E. Somasundaram, Professor and Head
140.	Dr. K. Ganesan, Assistant Professor (Agrl. Entomology)
<b>Department of Seed Science and Technology, TNAU, CBE</b>	
141.	Dr. J. Renugadevi, Professor (SST)
142.	Dr. K. Raja, Associate Professor (SST)
143.	Dr. S. Lakshmi, Associate Professor (SST)
144.	Dr. T. Anandh, Asst. Professor (Pl. Path.)

<b>Department of Soil Science &amp; Agrl. Chemistry</b>	
145.	Dr. T. Chitdeshwari, Professor (SS&AC)
146.	Dr. D. Jegadeeswari, Assoc. Prof. (SS&AC)
147.	Dr. J.Balamurugan, Asst. Professor (SS&AC)
148.	Dr. M.Gopalakrishnan, Asst. Professor (SS&AC)
<b>Centre for Plant Molecular Biology and Biotechnology, TNAU, Coimbatore</b>	
149.	Dr. S. Mohankumar, Director, CPMB&B
150.	Dr. R. Gnanam, Professor and Head
151.	Dr. N. Kumaravadivel, Professor and Head
152.	Dr. D. Uma, Professor and Head (Biochemistry)
153.	Dr. D. Sudhakar, Professor
154.	Dr. K.K. Kumar, Associate Professor
155.	Dr. N.Manikandaboopathi, Associate Professor
156.	Dr. P. Meenakshisundaram, Assistant Professor
157.	Dr. V.P. Santhanakrishnan, Assistant Professor
158.	Dr. M. Jayakanthan, Asst Prof (Bioinformatics)
<b>TNAU, Information and Training Centre, Chennai</b>	
159.	Dr. S. Suganya, Asst. Professor (Soil Science)
<b>Plant Pathology, TNAU, Coimbatore</b>	
160.	Dr. S. Nakkeeran, Professor ( Plant Pathology), TNAU, Coimbatore
161.	Dr. S. Vanitha, Professor ( Plant Pathology), TNAU, Coimbatore
162.	Dr. P. Renukadevi, Associate Professor ( Plant Pathology), Mettupalayam
163.	Dr. M. Muthamilan, Professor and Head, Dept. of Plant Pathology, TNAU, Coimbatore.
164.	Dr. G. Karthikeyan, Professor (Pl. Path.), TNAU, Coimbatore
165.	Dr. V. Bharanitharan, Professor (Pl. Path.), TNAU, Coimbatore
166.	Dr. Yesuraj, Professor (Pl. Path.), RRS, Ramanathapuram
167.	Dr. G. Thiribhuvanamala, Assoc. Professor (Pl. Path.), TNAU, Coimbatore
<b>Agricultural Entomology, TNAU, Coimbatore</b>	
168.	Dr.N.Sathiah, Professor and Head, Dept. of Entomology, TNAU, Coimbatore
169.	Dr. B. Vinothkumar, Asst Professor (Agrl Entomology), TNAU, Coimbatore
170.	Dr.T.Srinivasan, Asst. Prof. (Agrl. Entomology), Dept of Millets, TNAU, Coimbatore
171.	Dr. N. Chitra, Associate Professor (Agrl. Entomology), Dept. of Entomology, TNAU, Coimbatore
172.	Dr. E.Sumathi, Associate Professor (Agrl. Entomology), Dept. of Entomology, TNAU, Coimbatore
173.	Dr. D. Rajabaskar, Asst. Professor (Agrl. Entomology), Dept. of Entomology, TNAU, Coimbatore
174.	Dr. A. Suganthi, Assistant Professor (Agricultural Entomology), TNAU, Coimbatore
175.	Dr. R. Vishnupriya , Professor(Entomology), Dept. of Entomology, TNAU, Coimbatore
176.	Dr. S.Jeyarajan Nelson, Professor (Entomology), Dept. of Entomology, TNAU, Coimbatore
177.	Dr. K. Bhuvaneshwari, Professor of Entomology, Dept. of Entomology, TNAU, Coimbatore
178.	Dr.S.Sridharan, Prof (Entomology), Dept. of Entomology, TNAU, Coimbatore
179.	Dr.V.Balasubramani, Professor (Ento.), Dept. of Entomology, TNAU, Coimbatore
180.	Dr.S.Jeyarani, Professor (Ento.), Dept. of Entomology, TNAU, Coimbatore

<b>Department of Nematology, TNAU, Coimbatore</b>	
181.	Dr. K. Poornima, Professor and Head
182.	Dr. A. Shanthi, Professor (Nematology)
183.	Dr. B. Anita, Professor (Nematology)
184.	Dr. K. Devrajan, Professor (Nematology)
185.	Dr. G. Jothi, Associate Professor (Nematology)
186.	Dr. P. Kalaiarasan, Assistant Professor (Nematology)
187.	Dr. N. Swarnakumari, Assistant Professor (Nematology)
<b>Forest College and Research Institute, Mettupalayam</b>	
188.	Dr. G. Umopathy, Professor (Entomology), Mettupalayam
189.	Dr. M. Prabu, Assistant Professor (Hort.), Mettupalayam
<b>KVK, Ramanathapuram</b>	
190.	Dr.P.Balasubramanian, Asst.Prof. (Hort.)
<b>Adhiparasakthi Horticultural College, Kalavai</b>	
191.	Dr. M. Kannan, Dean,
<b>RVS Horticultural College, Sempatti</b>	
192.	Dr. P. Irene Vethamoni, Dean,

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Dean (Hort.)