PROCEEDINGS OF THE 34th CROP SCIENTISTS' MEET – HORTICULTURE 2018

The 34th Crop Scientist's Meet on Horticulture was held on 01.06.2018 at Seminar Hall I, TNAU, Coimbatore under the chairmanship of Dr. K. Ramasamy, Vice Chancellor, TNAU, Coimbatore. In connection with the Crop Scientist Meet, on 31.05.2018, the pre review meeting of the University Research Projects (URP) on Crop Improvement and Crop Management of all horticultural crops was taken up by Dr. K. Ramaraju, Director of Research, TNAU at Seminar Hall I, TNAU, Coimbatore. The pre review meeting began with an introduction by Dr. K. Ramaraju, Director of Research, who narrated the experiences and the expectations of the University especially in relevance to need based research. The pre review meeting on University Research Projects on Crop Protection aspects of horticultural crops was taken up at Centre for Plant Protection Studies, TNAU, Coimbatore by the Director (CPPS), TNAU, Coimbatore. The Deans of Horticultural Colleges, Coimbatore, Periyakulam & Trichy, Director (Crop Management), Director, (NRM), Special Officer (Seeds) and Director (CPMB) were present and extended assistance in reviewing the sub projects. Dr. M. Jawaharlal, Dean (Horticulture), HC&RI, Coimbatore presented the action taken on the recommendations made during the last meet. It was followed by presentations of the compiled report on research achievements on horticultural crops by the Heads' of the departments of Fruit Crops, Vegetable crops, Floriculture and Landscaping, Spices and Plantation crops and Medicinal and Aromatic Crops , HC&RI, TNAU, Coimbatore. Dr. V. Swaminathan, Dean, HC&RI, Periyakulam presented the action plan formulated for 2018 – 19 for fruits and vegetable crops while Dr. D. Saraladevi, Dean, HC&RI (W), Trichy presented the action plan for flower crops, spices and plantation crops and medicinal and aromatic crops.

After incorporating the suggestions made by Director of Research, presentations were made before the Vice – Chancellor on 01.06.2018 during the Crop Scientist Meet. Similarly, Dr. G. Thiribhuvanamala, Asst. Prof. (Pl. Path.) made presentations on action taken on recommendations the previous meet, progress made during 2017 – 18. Action plan for 2018 – 19 on the aspects of crop protection was presented by the Director (CPPS), TNAU, Coimbatore. The Vice Chancellor, Deans, Directors and Special Officers, Scientists from Horticulture, Crop Protection and other disciplines attended the 34th CSM (Horticulture) 2018.

Proceedings of the 33rd Horticulture Scientists meet are presented in the following order:

1. General recommendations
2. Staff pattern & Work load
3. Remarks on the individual university research projects.
4. Cultures under MLT/ART/FLD
5. Action plan: 2018 – 2019

Fruit Crops

General recommendation

- All the scientists including those in AICRP fruits are requested to formulate one or two University Sub Project based on the local issues (Action: All centres).
- Flavour compounds in mango cv. Alphonso may be ascertained (Action: Department of Fruit Crops, HC & RI, Periyakulam).
- DNA bar coding for sapota varieties released from HC & RI, Periyakulam may be speed up (Action: Department of Fruit Crops, HC & RI, Periyakulam)
- Identified Jackfruit accessions may be vegetatively propagated and planted in Dry land Agricultural Research Station, Chettinad. Different species available at NBPGR, sub centre Thrissur may be collected and exploited for rootstock purpose (Action: Dr. R. Jayavalli, Asst.Prof. (Hort.), AC & RI, Kudimiyanmalai).
- Mango cv. Nadusalai may be vegetatively propagated and popularized (Action: Dr. S. Srividhya, Asst.Prof. (Hort.), Mango Research Centre, Paiyur).
- Mango var. Sindhu may be purchased and introduced in orchard (Action: Department of Fruit Crops, HC & RI, Coimbatore)
- Mutation breeding may be attempted to create sufficient variability in fruit crops (Action: All Centres)
- Nematode infestations may be monitored in all fruit crops (Action: Department of Nematology, TNAU, Coimbatore)
- Efforts may be taken to manage pomegranate bacterial blight (Action: Asst. Prof. (Plant Path.), Dept. of Fruit Crops, Coimbatore and Department of Plant Pathology, CPPS, TNAU, Coimbatore)
- White Strawberry genotypes may be indentified and evaluated for commercial adoption (Action: HRS, Ooty)
- Mandarin var. Kinnow may be tested at Ooty, Coonoor, Kallar, Yercaud, Thadiyankudisai and Burliar for commercial adoption (Action: Professor and Head, HRS, Yercaud, Ooty, Thadiyankudisai)
- Diversity in the avocado genotypes may be documented and fat rich genotypes may be identified (Action: Professor and Head, HRS, Thadiyankudisai)
- Anti cancer properties in the seeded grape varieties may be studied. Cost effective training system like 'Y' trellis may be popularized among the grape growers. Attempts may be made to eliminate deficiency of muscat through conventional breeding approaches (Action: Professor and Head, GRS, Theni)
- Seedlessness in Jamun may be studied and efforts may be taken for developing seedless types (Action: Professor and Head, VRS, Palur and Professor and Head (Horticulture), AC & RI, Killikulam)
- In Citrus, collaborative research may be taken with CCRI, Nagpur in frontier areas. Production of virus free planting material should be commenced in consultation with citrus research station, Tirupati (Citrus Research Station, Sankarankovil).
- Performance of the successful Kiwi cultivar at HRS, Kodaikanal may be popularized in the nontraditional areas of Pulney hills (Action: Professor and Head, HRS, Kodaikanal)
- Butter Pear Ooty -1 may be mass multiplied and popularized at Ooty and Kodainal (Professor and Head, HRS, Ooty and Kodaikanal).

a. Fruit Crops

I. Staff pattern

Station	Designation	Discipline										Total
		Hort.	ENT	PAT	ANM	SSAC	CRP	ABT	SST	AGR	HSC	
Coimbatore	Professor	1 (1 AICRP)										1
	Asst. Prof	1 (1 AICRP)		1 (AICRP)	1		1 (AICRP)					4
Periyakulam	Professor	2 (1 AICRP)										2
	Assoc. Prof	1 (AICRP)										1
	Asst. Prof	2 (1 AICRP)	1 (AICRP)	1 (AICRP)		1	1	1		1	1	8
Trichy	Assoc. Prof	1										1
	Asst. Prof	2										2
Palur	Professor	1										1
	Asst. Prof				1				1			2
Madurai	Asst. Prof	1										1
Yercaud	Professor	1										1
HRS, TKD	Asst.Prof	1										1
GRS, Theni	Professor	1										1
	Asst. Prof	1										1
CRS, Sankarankovil	Professor	2										2
RRS, Paiyur	Asst. Prof	1										1
HRS, Ooty	Asst. Prof	1										1
AC&RI, KKM	Asst. Prof	1										1
RRS, APK	Asst. Prof	1 (AICRP)										1
Total		**21**	**1**	**2**	**2**	**1**	**2**	**1**	**1**	**1**	**1**	**33**

Among the 33 scientists, 21 are in Non-Plan Main and 12 are under ICAR - AICRP.

WORK LOAD OF SCIENTISTS FOR THE YEAR 2018-19 (%)

S. No.	Scientist Name	Univ. Sub Projects	AICRP / external funded projects	Teaching	Student guidance	Other activities Administration, farm / ODL courses / lab in-charge	Total
I	**HC&RI, Coimbatore**						
1.	Dr.R.M.Vijayakumar	15	-	25	20	40	100
2.	Dr.K.Soorianathasundaram	10	40	15	20	15	100
3.	Dr.M.Kavino	20	10	30	20	20	100
3.	Dr.C.Kavitha	10	30	20	25	15	100
4.	Dr.K.B.Sujatha	15	40	30	10	5	100
II	**HC&RI, Periyakulam**						
1.	Dr.J.Rajangam	15	30	20	10	25	100
2.	Dr.A.Solamalai	40	-	40	-	20	100
3.	Dr.I.Muthuvel	15	40	20	10	15	100
4.	Dr.N.Manikanda boopathi	20	-	40	15	25	100
5.	Dr.C.Subesh ranjith Kumar	15	40	25	10	10	100
6.	Dr.C.Ravindran	20	-	40	-	40	100
7.	Dr.A.Vijayasamundeeswari	20	40	15	-	25	100
8.	Dr.V.Vani	20	-	40	-	40	100
9.	Dr.S.Irulandi	15	40	20	-	25	100
10.	Dr.D.Janaki	15	15	40	-	30	100
11.	Dr. R.Pooraniammal	20	-	40	-	40	100
III	**HC&RI(W), Trichy**						
1.	Dr.H.Vijayaraghavan	15	-	30	-	55	100
2.	Dr.J.Auxcilia	-	-	50	20	30	100
3.	Dr.V.P. Santhi	15	-	40	-	45	100
4.	Dr. D. Vidhya	15	-	40	-	45	100
IV	**AC & RI, Madurai**						
1.	Dr.T.N.Balamohan	15	-	25	20	40	100

2.	Dr.V.Krishnamurthy	40	-	40	-	20	100
V	**GRS, Theni**						
1.	Dr.S.Saraswathi	40	-	-	10	50	100
2.	Dr.Subbiah	40	-	10	-	50	100
VI	**RRS, Paiyur**						
1.	Dr. S. Srividhya	30	-	-	-	70	100
VII	**VRS, Palur**						
1.	Dr.K. Nageswari	35	-	-	-	65	100
2.	Dr. I.Cannayane	60	-	-	-	40	100
VIII	**HRS, Ooty**						
1.	Dr. S. Karthikeyan	30	-	-	-	70	100
2.	Dr.Anand	30	-	-	-	70	100
IX	**HRS, Yercaud**						
1.	Dr.L. Pugalendhi	30	-	-	-	70	100
2.	Dr. P.Arul Arasu	30	-	-	-	70	100
X	**HRS, Kodaikanal**						
1.	Dr.T.Saraswathi	30	-	-	10	60	100
2.	Dr.C.Thangamani	30	-	10	-	60	100
XI	**HRS, Thadiyankudisai**						
1.	Dr. S. Anandan	25				75	100
2.	Dr.Muthuramalingam	20	-	20	-	60	100
XII	**CRS, Sankarankovil**						
1.	Dr. S. Muthulakshmi	30	-	-	-	70	100
2.	Dr.P. Nainar	30	-	-	-	70	100

I. LIST OF CULTURES UNDER MLT / ART

S. No.	Crop	Name of the culture / Hybrid	MLT / ART	Centre
Fruit Crops				
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

LIST OF ONGOING RESEARCH PROJECTS

I. CROP IMPROVEMENT

S.No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
UNIVERSITY RESEARCH PROJECTS			
A. MANGO			
I. Dept. of Fruit Crops, HC&RI, Coimbatore			
1.	**HCRI / CBE / HOR / FRU / 2014 / 005** Studies on rootstock evaluation and exploitation of polyembryonic rootstocks in mango. Period: July, 2014 – June,2017	Dr .R.M.Vijayakumar Professor and Head	Collection of polyembryonic varieties may be strengthened and evaluated for abiotic stress tolerance.
B. BANANA			
I. Dept. of Fruit Crops, HC&RI, Coimbatore			
1.	**HCRI/CBE/HOR/ FRU/ 2012/001** Crop improvement in banana Period: Nov. 2012 – Mar 2018	Dr.K.Soorianathasundaram Professor (Hort.)	The sub-project may be closed. The MLT may be continued with the identified promising cultures.
II. HC&RI(W), Trichy			
1.	**HCRI/TRY/HOR/FRU/2014/004** Screening of Banana genotypes for sodicity tolerance Period: Jan. 2014 – Dec. 2018	Dr.J.Auxcilia Associate Professor (Hort.)	Project may be continued as per the objectives
C. PAPAYA			
I. Dept. of Fruit Crops, HC&RI, Coimbatore			
1.	**HCRI/CBE/HOR /FRU/2012/001** Crop improvement in papaya Period: Nov. 2012 – Mar 2018	Dr.K.Soorianathasundaram Professor (Hort.)	The project may be concluded. A new sub-project may be proposed to evaluate the selected advanced generation of intergeneric and intervarietal hybrid progenies for yield, quality and PRSV resistance
II. ARS, Virinjipuram			
1.	**HCRI/VIJ/HOR/FRU/2014/001** Improvement of local papaya types for high yield and quality suitable to Vellore district Period: Nov.2014 - Oct. 2017	Dr.B.K.Savitha Assistant Professor (Hort.)	Project may be closed and completion report may be sent.

D. GRAPES			
I. Grapes Research Station, Anaimalayanpatty			
1.	**HCRI/TNI/HOR/FRU/2015/001** Collection, conservation and evaluation of grape *(Vitis sp.)* germplasm Period: June, 2015 - May, 2019	Dr. A. Subbiah Assistant Professor (Hort.)	Focus may be given for varieties with commercial value. The project may be continued.
E. GUAVA			
I. Dept. of Fruit Crops, HC&RI, Coimbatore			
1.	**HCRI/CBE/HOR/ FRU/2013/003** Improvement of guava (*Psidium guajava*) through selection and inter-varietal hybridization Period: July 2013 to July 2021	Dr.M.Kavino, Assistant Professor (Hort.)	The identified half sib progeny, PG-1-7 may be vegetatively propagated and further evaluated.
II. HC&RI(W), Trichy			
1.	**HCRI/TRY/HOR/FRU/2014/001** Screening and evaluation of guava (*Psidium guajava*) germplasm for sodicity tolerance Period: Jan 2014 to Dec 2018	Dr. V.P.Santhi Assistant Professor (Hort.)	The project may be closed and completion report may be sent.
F. CITRUS			
I. HRS, Yercaud			
1.	**HCRI/YCD/HOR/FRU/2016/001** Survey, collection and evaluation of uin orange varieties under Shevaroy condition. Period: Jan 2016 to Jun 2021	Dr. L.Pugalendhi Professor and Head	Survey may be intensified in Shevaroy and Pulney hills and identify the variants. The promising variant/s may be promoted.
G. JACKFRUIT			
I. Vegetable Research Station, Palur			
1.	**HCRI/ PLR/ HOR/ FRU/ 2013/ 001** Identification, evaluation and development of a gum-less jack fruit variety suitable for urban market in Tamil Nadu. Period: Nov 2013 to Oct 2016 (extended upto October 2017)	Dr. K. Nageswari Professor and Head	Identified gumless variety may be proposed for variety release after confirming the gumlessness. The project may be closed.
II. AC & RI, Kudimiyanmalai			
1.	**HCRI/KDM/HOR/FRU/2016/001** Identification and evaluation of high yielding good quality Jack genotypes suitable for dry tracts of Tamil Nadu. Period: June 2016 to May 2019	Dr. R. Jayavalli Assistant Professor (Hort.),	The jackfruit genotypes already identified at Department of Fruit Crops, HC & RI, Coimbatore may be multiplied, planted and evaluated.

H. POMEGRANATE			
I. **HC&RI(W), Trichy**			
1.	**HCRI/TRY/HOR/FRU/2014/001** Screening and evaluation of Pomegranate (*Punica granatum)* accessions against sodicity tolerance under field conditions Period: June 2014 to June 2018	Dr. V.P.Santhi Asst. Prof. (Hort.)	The project may be closed and completion report may be sent. A new sub project may be proposed.
II. Department of Horticulture, Agricultural College and Research Institute, Madurai – 625 104			
1.	**HCRI/MDU/HOR/FRU/2016/001** Collection and evaluation of pomegranate genotypes for high yield and quality Period: Dec 2016 to Nov. 2019	Dr. V. Krishnamoorthy Asst. Prof. (Hort.)	The project may be continued with partial modification to create further variability in the already existing commercial variety, Bhagwa for bacterial blight and spot resistance / tolerance through mutation breeding approach rather than mere evaluation of already released varieties.
I. Jamun			
I. Department of Horticulture, AC&RI, Killikulam			
1.	**HCRI/KKM/HOR/FRU/2015/001** Collection and evaluation of jamun (*Eugenia jambolana* L.) varieties and eco types for higher yield and quality Period: June 2015 to May 2020	Dr.M.I.Manivannan Asst. Prof. (Hort.)	In addition to the collection already made, further variability may be created through mutation breeding since long gestation period and seededness of the existing types.

II. CROP MANAGEMENT

S. No.	Project Number, Title and Period	Project Investigator	Remarks
A. MANGO			
I. RRS, Paiyur			
1.	**HCRI/PAI/HOR/FRU/2012/002** Effect of different chemicals on Off-season flower induction in Mango Period: Aug 2012 – Sep 2016	Dr. S. Srividhya Asst. Prof. (Hort.)	The project may be closed and completion report may be sent. The new University sub project may be proposed in Crop Improvement involving traditional elite varieties like Mulgoa and Salem Bangalora as one of the parents.
B. BANANA			
I. AC & RI, Eachangkottai, Thanjavur			
1.	**CPMB/EKT/BIT/FRU/2016/001** Establishment of disease free and quality planting materials through *in vitro* mass multiplication of rhizome bud of banana cultivar Poovan (AAB) Period: May 2016 to April 2018	Dr.P.Sivakumar Asst. Prof. (Biotech)	The project may be continued and micropropagated plantlets of Poovan may be planted in the farmers holdings and will be compared with suckers of Poovan for yield and quality.
II. Dept. of Plant Breeding and Genetics, AC & RI., Killikulam			
1.	**CPMB/KKM/BIT/FRU/2017/001** Micropropagation protocol development for banana cultivars *viz.*, Matti, Ney Poovan and Monthan. Period: February 2017 to January 2020	Dr. S. Merina PremKumari Asst. Prof. (Biotech)	The project may be continued and micro propagated plantlets of Poovan may be planted in the farmers holdings and will be compared with suckers of Poovan for yield and quality.
C. GRAPES			
I. Dept. of Fruit Crops, HC&RI, Coimbatore			
1.	**HCRI/CBE/HOR/FRU/2014/007** Standardization of *in vitro* mass propagation protocol by micrografting in grapes (*Vitis vinifera* L.) Period: May 2017 to April 2017	Dr.C.Kavitha Asst. Prof. (Hort.)	The project may be closed and completion report may be sent.
2.	**HCRI/CBE/HOR/FRU/2015/008** Standardization of integrated nutrient management practice for enhancing productivity and quality in grape (*Vitis vinifera* L.) var. Red Globe Period: June 2015 to May 2018	Dr.C.Kavitha Asst. Prof. (Hort.)	The project may be closed and completion report may be sent.

II. Grapes Research Station, Anaimalayanpatty			
1.	**HCRI/TNI/HOR/FRU/2016/001** Quality improvement in grape *(Vitis vinifera* L.) var. Muscat Hamburg through special viticultural practices Period: April 2016 to March 2018	Dr. S. Parthiban Prof. (Hort.)	The project may be continued as per the objectives.
2.	**HCRI/TNI/HOR/FRU/2016/002** Studies on berry cracking and its management in grape *(Vitis vinifera* L.) var. Muscat Hamburg. Period: April 2016 to March 2018	Dr. S. Parthiban Prof. (Hort.)	The project may be continued as per the objectives.
3.	**HCRI/TNI/HOR/GRP/2016/003** Studies on influence of season and bud level of pruning for double pruning and double cropping system in grape (*Vitis vinifera* L.) var. Muscat Hamburg. Period: April 2016 to March 2018.	Dr. A. Subbiah Asst. Prof. (Hort.)	The project may be continued as per the objectives.
4.	**NRM/TNI/SAC/FRU/2016/001** Effect of Dog Ridge (*Vitis champini*) rootstock on vine vigour, yield, quality and nutrient uptake of grape (*Vitis vinifera* L.) var. Muscat Hamburg. Period: April 2016 - March 2018	Dr. R. Indirani Asst. Prof. (SSAC)	The project may be continued as per the objectives.
D. GUAVA			
I. Dept. of Fruit Crops, HC&RI, Coimbatore			
1.	**HCRI/CBE/HOR/FRU/2013/004** High density planting and canopy management in guava cv.Lucknow 49. Period: June 2013 to May 2019	Dr.M.Kavino Asst. Prof. (Hort.)	Under this project, optimum spacing and nutrient doses were standardized. For complete package, optimum pruning level may be standardized.
II. HC&RI(W), Trichy			
1.	**HCRI/TRY/FRU/GUA/2014/003** Standardization of fertigation schedule in High density planting of Guava cv. L – 49 under alkaline soil. Period: Jan 2014 to December 2016	Dr.J.Auxcilia Assoc. Prof. (Hort.)	The project may be sent. Since the trial under sodic soil, the effect of fertigation on soil chemical properties may be studied before sending the completion report.

2.	**HCRI/TRY/BIC/FRU/2017/001** Studies on nutritional and biochemical compositions of guava and mango varieties grown under salt affected soil. Period: January 2017 to December 2018	Dr.K. Gurusamy Prof. (Biotech)	The objectives of the project are not clear. Hence, the project may be closed and new project relevant to the sodic soil may be proposed.
E. CITRUS			
I. Citrus Research Station, Sankarankovil			
1.	**HCRI/SAN/HOR/ FRU/ 2016/001** Effect of organic manures on growth and yield of acid lime in Tirunelveli District Period: Jan. 2016 to Dec. 2019	Dr. S. Muthulakshmi Prof. & Head	After confirming the first year results, the project may be closed. New project may be proposed for year round production of acid lime.
2.	**HCRI/ SAN /HOR/ FRU/ 2016/002** Effect of growth regulators on growth and yield of Acid lime *(Citrus aurantifolia* Swingle). Period: June 16 to May 2019	Dr. K. Sundharaiya Asst. Prof. (Hort.)	After ascertaining the first year results, the project may be closed.
F. SAPOTA			
I. Post Harvest Technology Centre, TNAU, Coimbatore			
1.	**HCRI/CBE/HOR/FRU/2016/001** Developing a process for uniform ripening and enhancing the shelf life and quality of Sapota (*Manilkara achras*). Period: August 2016 to July 2019	Dr.K.Venkatesan Prof. & Head	The results of this project may be popularized in co ordination with Department of Fruit Crops, HC & RI, Periakulam.
G.KIWI			
I. HRS, Kodaikanal			
1.	**HCRI/KDL/HOR/FRU/2014/001** Standardization of propagation techniques in kiwi (*Actinidia deliciosa*) under Kodaikanal conditions. Period: June 2014 to May 2017	Dr. C. Thangamani Asst. Prof. (Hort.)	The results are not convincing. Efforts may be intensified to develop a successful protocol for propagation of kiwi.
H. STRAWBERRY			
I. HRS, Ooty			
1.	**DCM/OTY/AGR/FRU/2017/001** Impact of integrated nutrient management on growth, yield and profitability of strawberry under temperate regions of Nilgiris District, Tamil Nadu. Period: Sep.2017 to Aug 2020	Dr. K. Ramamoorthy Prof. (Agronomy)	The project may be continued. Locally available organic sources of manures may be utilized.

CROP IMPROVEMENT

Crop: Banana						
Theme No. and Title		**Theme No 1: Improvement of banana through breeding approaches**				
Project No. & Title		**HCRI/ CBE/ HOR/FRU/2012/ 001;** Crop Improvement in Banana				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	To evaluate existing hybrids for yield and quality with resistance to nematodes and wilt	Dr.K.Soorianathasundaram Professor (Horticulture) HC & RI, Coimbatore Dr. P. Vertrvelkalai AP (Nematology)	Field screening of selected hybrids during 2016-17 revealed that H.531, H.914 and H.916 were resistant with very low lesion indices of 7.00, 6.33 and 7.33, respectively. The other pre-release cultures *viz.,* H.212, NPH 02-01 and H.96/7 continued to show tolerance reaction with lesion indices ranging from 12.87 to 16.33 as compared to the lesion index of 60 in susceptible 'Ney Poovan'.	Confirmatory evaluation of 13 hybrids for yield and resistance attributes was taken up. Better bunch yield was registered by H.212 (12.12 kg), H.96/7 (14.01 kg), H.914 (14.4 kg), H.915 (14.92 kg) and H.916 (15.2 kg). Screening against lesion nematodes confirmed that the hybrids H. 531, H. 914 and H.916 were resistant with low lesion indices (<10 %) as compared susceptible check Ney Poovan' (>40 %). Other hybrids evaluated were rated as tolerant.	Multiplication of these cultures to take up MLT/ART.	*Fusarium* and nematode resistant banana hybrid(s) with better yield and quality attributes will be identified.

2.	To take up MLT of promising hybrids	Dr.K.Soorianathasundaram Professor (Horticulture) HC & RI, Coimbatore	During December 2016, nine selected hybrids *viz.,* H.906, H.912, H.914, H.915, H.916, H.923, H-11-21, H-11-23 and H-11-25 were planted in field for confirmatory evaluation along with earlier selected four pre release cultures *viz*., H.212, NPH 02-01, H. 531 and H. 96/7.	The earlier selected banana pre release cultures H.96/7, H.212, NPH-02-01 and H.531 are now under multilocation trials at Periyakulam, Madurai, Trichy and Bhavanisagar. Further propagation of these cultures are also in progress to take up ART.	ART will be conducted in progressive banana growers fields.	Banana hybrids with improved yield levels and quality attributes similar to existing cultivated varieties with resistance attributes in addition.

Project No. & Title		HCRI/TRY/HOR/FRU/2014/004; Screening of Banana genotypes for sodicity tolerance				
S.No.	Theme Activity	Name of the Scientist (s) and Centre	Year 2016-17	Year 2017-18	Year 2018-19	Deliverables
			Progress made		Work plan	
1.	To screen banana genotypes for sodicity tolerance	Dr.J.Auxcilia Assoc.Prof(Hort.) HC & RI (W), Trichy	Evaluation of fifteen banana genotypes revealed that the cvs. Saba (ABB), FHIA-1 (AAAA) and Karpooravalli (ABB) were found to be tolerant to sodic soil conditions with respect to growth, bunch traits and biochemical properties.	A total number of seventeen genotypes representing different genomes have been planted in the field during the last week of January 2018 for confirming the results. .	Continuing the confirmatory trial.	Identification of potential varieties with salt tolerance for commercial exploitation and as genetic resource for breeding programmes.

Crop: PAPAYA						
Theme No. and Title		Theme No 1: Improvement of papaya through breeding approaches				
Project No. & Title		HCRI/ CBE/HOR/FRU/2012/001; Crop Improvement in Papaya				
S.No.	Theme Activity	Name of the Scientist(s) and Centre	Year 2016-17	Year 2017-18	Year 2018-19	Deliverables
			Progress made		Work plan	
1.	To develop varieties with Papaya Ring Spot Virus resistance	Dr.K.Soorianathasundaram, Professor (Hort.) HC & RI, Coimbatore	Intergeneric hybridization involving papaya varieties and *Vasconcellea cauliflora* was carried out to incorporate PRSV resistance and	In evaluation of F_6 intergeneric population, two single plant selections *viz.,* CPV 1-14- 26 and CPV-3-8-02 were promising for fruit yield (60.41 kg and	Evaluation of F7 population screening for PRSV resistance and yield.	PRSV resistant papaya hybrid with better yield and quality attributes.

			subsequently the progenies from six families were evaluated over five generation (up to F_5) till 2017. These six families (CPV-1-14, CPV-2-15, CPV-2-19, CPV-3-8, CPV-3-12 and PNV-1-2) were selected based on delayed disease development along with low disease score index.	65.48 kg/ plant, respectively). Moderate yield with low disease severity (score-5) was observed in three selections *viz.*, CPV-1-14-39, CPV-2-19-27 and CPV-3-8-22. These five selections have been sibmated to generate F7 population.		

S.No.	Theme Activity	Scientists and Centre	Year 2016-17	Year 2017-18	Year 2018-19	Deliverables
2.	Breeding and development of improved gynodioecious varieties for high yield, better quality attributes and PRSV tolerance	Dr.K.Soorianatha sundaram Professor (Hort.) HC & RI, Coimbatore	During the evaluation of F5 generation of the earlier gynodieocious selection (Sel C1-33) made through inter varietal hybridization, based on low disease severity, better fruit set and red pulp colour, **two single plant selections** have been made. The yield of these two selections range from 39-42 kg per plant.	Selfing was carried out in the select two gynodioecious lines and these selections will be forwarded for further purification and evaluation in F6 generation.	Evaluation in F_6 generation of the single plant selections for further purification before forwarding for MLT.	Improved gynodioecious papaya hybrids with better yield, fruit quality and PRSV tolerance.

Crop: Mango						
Theme No and title		**Theme No 1: Conservation of traditional varieties of Tamil Nadu for future breeding programme**				
Project No.& Title		**NADP /HCRI/PAI/HOR/FRU/2016/008 Mango Research Centre**				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Collection of traditional varieties of Tamil Nadu	Dr. S.Srividhya Asst. Prof (Hort.) RRS, Paiyur	Collection of Varieties	The varieties Kesar, Dashehari, Kiddamar, Peruneelum, Swarnarekha Alibasant, Lalbaugh, Arka Uaday, Royal special, Neelishan genotypes have been collected and planted.	Maintenance of the collected genotypes.	Development of genetic stock for future breeding programmes.
2.	Identification and Collection of varieties for processing and pickling types	Dr. S.Srividhya Asst. Prof (Hort.) RRS, Paiyur	Collection of varieties for processing and pickling types	Collection and establishment of 7 pickle varieties Punasa, Punasa local, Jallal, Kodhapallikoppra, Seeri, Appimidi, Geddamar and 4 juice varieties Cherrukkurasam Adhimadhuram, Perukkurasam, Chinnarasam.	Maintenance and quality analysis of the pickle and processing varieties.	Development of genetic stock for future breeding programmes.

Theme No and title		Theme No 2: Rootstock breeding against abiotic stresses				
Project No & Title		HCRI/CBE/HOR/FRU/ 2014/005; Studies on rootstock evaluation and exploitation of polyembryonic rootstocks in mango				
S.No.	Theme Activity	Name of the Scientist(s) and Centre	Year 2016-17	Year 2017-18	Year 2018-19	Deliverables
			Progress made		Work plan	
1.	Assembling the polyembryonic types and conducting pot culture trials against abiotic stresses	Dr.RM.Vijayakumar Prof.and Head(Fruits) **HC & RI, Coimbatore**	Commercial varieties namely Neelum, Bangalora, Imampasand, Alphonso and Banesan were grafted against all the varieties mentioned above in addition to Sendhuram. Imampasand rootstock was highly compatible with Alphonso scion. For Imampasand scion variety, Imampasand rootstock was most ideal. Another experiment was conducted on tolerance to salinity by different rootstocks. Alphonso rootstocks were found to be the best among the rootstocks studied at all salt levels, followed by Neelum.	• The mango stones were collected from NBPGR, Thrissur and raised in nursery beds • After establishment, the seedlings were transferred to polybags and grown for about three months • To fix the salinity level, different salt levels were imposed to the seedlings. • After 25 days of salt treatments, except 0 mM NaCl (control) all the seedlings showed heavy scorching symptoms and failure to survive in the imposed salinity conditions.	The experiment will be continued with reduced salt level.	Identification of rootstocks with salt tolerance for commercial exploitation.

Crop: ACID LIME						
Theme No and Title	**Theme No 1: Improvement of Acid lime through breeding approaches**					
Project No & Title	**Enrichment, characterization and evaluation of Acid lime germplasm for 'year round' production**					
Sl.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Survey and identification of suitable genotypes for 'year round' production	Dr. S. Muthulakshmi Professor and Head Dr.K.Sundharaiya Asst. Prof.(Hort.) CRS, Sankarankovil	Acid lime varieties *viz*., Balaji, Vikram, Pramalini, NRCC 7 and NRCC 8 & rootstocks *viz*., CR H – 12, X-639, Sonarians, NRCC – 3, NRCC – 6, Alemow and Volkamariana were collected.		The varieties and rootstocks will be planted after completion of land leveling and partitioning of field.	Identification of suitable variety with 'year round' production.

Crop: GUAVA						
Theme No. and Title		**Theme No 1: Improvement of guava through breeding approaches**				
Project No. & Title		**HCRI/CBE/HOR/ FRU/2013/003: Improvement of guava (*Psidium guajava*) through selection and inter-varietal hybridization**				
Sl.No	**Theme Activity**	**Name of the Scientist(s) & Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Screening of open pollinated progenies and hybrid derivatives for red pulp, less / soft seededness and yield.	Dr. M.Kavino Asst.Prof. (Hort.) HC & RI, Coimbatore	• Generation of OP progenies from Arka Kiran • Hybridization work with Allahabad Safeda, Lucknow 49, Taiwan Guava with red pulped Arka Kiran and Lalit.	• A promising selection from half-sib population of Arka Kiran (Sel PG 1-7) made during 2017-18. • <u>Features of Sel. PG 1 -7 :</u> ➢ Average fruit weight of 200-230g ➢ Pulp firm and pink in colour ➢ TSS of 13-15° Brix ➢ Ascorbic acid of 245.50 mg per 100g pulp ➢ Lycopene content of 5-7 mg / 100g The selection has been vegetatively propagated and planted for further evaluation.	• Vegetatively propagated selection <u>PG 1-7</u> will be evaluated further under field conditions. • Continuing the hybridization work and evaluation of progenies.	Improved guava hybrid/ OP progeny with pink pulp and high yield for commercial exploitation.

Project No. & Title		HCRI/TRY/HOR/FRU/2014/001; Screening and evaluation of guava (*Psidium guajava*) germplasm for sodicity tolerance				
Sl.No	**Theme Activity**	**Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Screening of guava varieties and genotypes for salt tolerance	Dr.V.P. Santhi Asst.Prof.(Hort.) HC & RI (W), Trichy	31 accessions of guava were collected and planted in Orchard, HC & RI (W), Trichy and evaluated for 3 years from 2014 to 2018 Feb. Among these, 'Mirzapur Seedling' registered better physiological attributes *viz.,* higher RWC (89.11%) SPAD value, nitrate reductase enzyme activity, catalase enzyme activity ((12.230µg of H2O2g-1//min-1), soluble protein accumulation (576.740 mg/g), lower leaf Na (0.247 per cent), higher leaf K (5.470 per cent) contributing to tolerance and high yield (26.802kg/tree).		Continuation of observations and supportive bio-chemical studies to select tolerant genotypes.	Identification of Guava varieties with sodicity tolerance.

Crop: GRAPES						
Theme No. and Title	**Theme No1 : Improvement of grapes through breeding approaches**					
Project No & Title	**HCRI/TNI/HOR/FRU/2015/001;** Collection, conservation and evaluation of grape *(Vitis sp.)* germplasm					
Sl.No.	**Theme Activity**	**Name of the Scientist (s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Collection, assembling and evaluation of grape (*Vitis vinfera* L. & *Vitis labrusca* L.) varieties and clones suitable for table, wine, juice and raisin making purposes from different sources for yield and quality.	Dr. A. Subbiah Asst.Prof.(Hort.) Grapes Research Station, Anaimalayanpatty	A total of 130 grape accessions and 10 different grape rootstocks were sourced from ICAR - National Research Centre for Grapes, Pune and Grapes Research Station, SKLTSHU, Rajendra Nagar, Hyderabad, ICAR - Indian Agriculture Research Institute, New Delhi are maintained at Grapes Research Station.	Five distinct Muscat Hamburg (Panneer) clones were identified *viz*., Chinthamani Panneer (Drought & downy mildew tolerance),Jenis Panneer (Thick skinned berries), Anaikajam Panneer (Loose bunch with bold berries), Koothanatchi (Berries with attractive dark blue berries and high juice recovery - 59.20 %) and Mathampatty Panneer (Excellent musk flavor and high TSS - 22.2^{0}Brix).	Third season fruit (forward) pruning will be carried out during third week of May, 2018 and continuation of evaluation.	Possible outcome for improved variety

Crop: JACK FRUIT						
Theme No. and Title	**Theme No 1: Collection, evaluation and identification of high yielding and quality jackfruit**					
Project No. & Title	**HCRI/ PLR/ HOR/ FRU/ 2013/ 001;** Identification, evaluation and development of a gum-less jack fruit variety suitable for urban market in Tamil Nadu					
S.No	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress Made		**Work plan**	
1.	Survey, collection, evaluation and development of gum-less jackfruit variety suitable for small family and urban markets	Dr. K. Nageswari Prof. and Head VRS, Palur	During 2016-17, six new genotypes were identified.	Three off-season bearing types *viz*., Pudhukoorpet local-22 (AH57), Pudhukoorpet local-23 (AH58) and Mavidanthal local (AH59) were identified.	Already identified gumless and 'Thousand fruited jackfruit' accessions will be evaluated further for their yield and quality attributes.	Release of high yielding jackfruit variety with good quality attributes.
Project No. & Title		**HCRI/KDM/HOR/FRU/2016/001 ;** Identification and evaluation of high yielding good quality Jack genotypes suitable for dry tracts of Tamil Nadu				
S.No.	**Theme activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	To survey and collect jackfruit genotypes that are regular and prolific in bearing with high quality fruits	Dr. R. Jayavalli Asst.Prof.(Hort.) AC & RI, Kudimiyanmalai	Thirty five genotypes were identified during 2016-17	Twenty genotypes were identified during 2017-18. Among the 55 genotypes identified sofar, five elite types *viz*., Ah4 (Pullanviduthy Local), Ah15 (Alangadu Local),	Vegetatively propagated elite genotypes will be planted in the main field and evaluated after fruiting.	Release of varieties with better yield/ fruit quality attributes for commercial exploitation.

				Ah 32 (Senthangudi Local), Ah-44 (Pullanviduthy Local) and Ah-46 (Senthangudi Local) propagated through soft wood grafting.		

Crop: **Pomegranate**						
Theme No. and Title		**Theme No 1: Collection and evaluation of pomegranate germplasm**				
Project No. & Title		**HCRI/TRY/HOR/FRU/2014/001;** Screening and evaluation of pomegranate (*Punica granatum)* accessions against sodicity tolerance under field conditions				
Sl.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress Made		**Work plan**	
1.	Screening the pomegranate germplasm for promising sodicity tolerant pomegranate accessions with better yield and quality attributes	Dr. V.P.Santhi Asst.Prof.(Hort.) HC&RI(W), Trichy	18 accessions of pomegranate were collected and planted at Orchard, HC & RI(W), Trichy and are being evaluated .		Further Monitoring of the field performance	Identifying the suitable genotype for commercial exploitation under sodicity soil conditions.

Project No. & Title		HCRI/MDU/HOR/FRU/2016/001; Collection and evaluation of pomegranate genotypes for high yield and quality			
Sl.No	Theme Activity	Name of the Scientist(s) and Centre	Year 2016-17 / Year2017-18 Progress made	Year 2018-19 Work plan	Deliverables
1.	Collection and evaluation of pomegranate genotypes for high yield and quality.	Dr. V. Krishnamoorthy Asst. Professor (Hort.) AC & RI, Madurai	Pomegranate varieties Ruby, G-137, Ganesh, Bhagwa, Jodhpur Local, PhuleArakta, were collected from ICAR-National Research Centre for Pomegranate, Solapur during November 2016. During January 2017 Jothi, Kabul, Vellode Local and Madurai local (seedling progenies) were collected and planted in the field during January 2017.	Further monitoring of the field performance	Identifying the suitable genotype for commercial exploitation

Crop: JAMUN						
Theme No. and Title		Theme No 1: Collection, evaluation and identification of high yielding and quality seedless jamun				
Project No. & Title		HCRI/KKM/HOR/FRU/2015/001 Collection and evaluation of jamun (*Eugenia jambolana* L.) varieties and eco types for higher yield and quality				
S.No.	Theme Activity	Name of the Scientist(s) and Centre	Year 2016-17 / Year 2017-18 Progress made		Year 2018-19 Work plan	Deliverables
1.	Collection and evaluation of seedless jamun genotypes	Dr. M. I. Manivannan Asst.Prof.Hort.) AC & RI, Killikulam	A total of 12 accessions were assembled during 2016-17. During, 2017-18, 5 accessions were assembled. Among the 17 accessions, KEJ 11 is noted for bigger sized fruits with small seeds and KEJ 12 is of medium - small sized fruits but with very good taste and flavour.		The collected germplasm will be evaluated for yield and quality	Identification of high yielding quality seedless jamun variety suitable for commercial cultivation.

Crop: Mandarin Orange						
Theme No and Title		**Theme No 1: Collection and enrichment of mandarin orange germplasm**				
Project No & Title		**HCRI/YCD/HOR/FRU/2016/001 ;** **Survey, collection and evaluation of mandarin orange varieties under Shevaroy condition**				
Sl.No.	**Theme Activity**	**Name of the Scientist /s and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Survey, collection and evaluation of mandarin orange varieties suitable for Shevaroy hills	Dr.L.Pugalendhi Prof. and Head HRS, Yercaud	A total of hundred Coorg mandarin oranges had been assembled from CHES, Chettali, Karnataka.	Sourcing of planting materials bud sticks of Khasi, Sikkim, Kinnow and Darjeeling mandarin and budded plants of Nagpur mandarin and Nagpur mandarin seedless from Central Citrus Research Institute (CCRI), Nagpur, Maharastra was done. Rangpurlime was used as a rootstock and budding was done with bud sticks of Khasi, Sikkim, Kinnow and Darjeeling mandarin at HRS, Yercaud.	The budded plants are maintained in the glass house nursery for planting in June –July 2018.	Identification of high yielding mandarin orange variety suitable for Shevaroy hills.

Crop: AVOCADO						
Theme No and Title	**Theme No 1: Collection and enrichment of avocado genotypes**					
Project No & Title	**HCRI/TDK/HOR/SPC/2013/002; Evaluation of Avocado (*Persia americana* M.) genotypes for yield and quality in the lower pulney hills condition**					
Sl.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Collection and evaluation of avocado varieties and genotypes suitable for lower Pulney hills	Dr.Muthuramalingam Asst.Prof.(Hort.) HRS, Thadiyankudisai	Thirteen new avocado genotypes were identified and scions were collected and grafted on seedling rootstock.		Grafts will be planted during onset of monsoon.	Identification of best performing varieties based on yield and quality parameters

Crop: Strawberry						
Thme No and Title	**Theme No 1: Collection and enrichment of strawberry genotypes**					
Project No & Title	**Collection and evaluation of Strawberry varieties suitable for Nilgiris**					
Sl.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Collection and evaluation of varieties suitable for the Nilgiris	Dr. S. Karthikeyan Asst.Prof.(Hort.) HRS, Ooty	Strawberry varieties Cristal, Sweet Charlie, Winter Dawn, Nabila have been collected and 200 plants of each variety were planted in greenhouse for further evaluation.	Four strawberry varieties were collected and planted for assessing the performance and crop is in vegetative stage.	Assessing their performance	Identification of best performing genotypes based on yield and quality parameters

B. CROP MANAGEMENT

Crop: MANGO						
Theme No and title		**Theme No 1:** Optimizing the factors responsible for maximizing the production with quality fruits				
Project No.& Title		Canopy management in HDP & UHDP in mango				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Standardization of canopy management practices for mango in HDP & UHDP	Dr.V.Swaminathan Dean (Hort.) Dr. J. Rajangam Prof. and Head (Fruits) HC & RI, Periyakulam	Planting of mango var. Alphonso, Imam Pasand, Neelum, Banganapalli for an area of 10 acres under HDP system	The plants are two years old. Training was carried out for establishing good framework.	Recording the canopy volume and other morphological characters	Technologies for enhancement of production and productivity through HDP and UHDP by accommodation of more number of plants / unit area

Crop: ACID LIME						
Theme No and title		**Theme No 1:** Optimizing the factors responsible for maximizing the production with quality fruits				
Project No.& Title		Optimizing the nutrient requirement for maximizing the yield and quality in Acid Lime cv.PKM 1				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Standardization of nutrient requirement for Acid lime	Dr. J. Rajangam Prof. and Head (Fruits) Dr. C.Subesh Ranjith Kumar Asst.Prof.(Hort.) HC & RI, Periyakulam	The trial was laid out in bearing trees of variety PKM -1.	Stage wise observations were recorded. In addition, soil and leaf nutrient status were also analysed.	Continuation of the trial and recording observations on yield and quality parameters of acid lime variety PKM -1.	To standardize the optimum nutrient level for acid lime variety PKM -1 to increase the yield and quality.

Crop: SAPOTA						
Theme No and title		**Theme No 1:** Optimizing the factors responsible for maximizing the production with quality fruits				
Project No.& Title		Maximizing the population per unit area with optimum nutrient levels for higher yield with quality fruits				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Standardization of spacing with different nutrient regimes	Dr. I. Muthuvel Asoc.Prof.(Hort.) HC & RI, Periyakulam	Trial was imposed in existing trees var. PKM -1. The plant spacing of 8 x 4 m (216 trees/ha) and application of NPK each one kg / tree (in two stages- Jan & June).	The growth, yield and quality parameters were recorded.	The trial will be continued for the confirmation of results.	To optimize suitable plant population and nutrient level to increase the yield and quality of sapota of var. PKM -1

Crop : GUAVA						
Theme No and title		**Theme No 1:** Optimizing the factors responsible for maximizing the production with quality fruits				
Project No.& Title		**HCRI/CBE/HOR/FRU/2013/004** – High density planting and canopy management in guava cv.Lucknow 49				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Studying the effect of HDP and fertigation in maximizing the productivity per unit area and quality of fruits	Dr.M.Kavino Asst. Prof. (Hort.) HC & RI, Coimbatore	Experiment was laid out in FRBD design with three replications and two factor treatments. Different spacing levels *viz.,* S_1- 2m x 1m; S_2 – 3m x 1m; S_3 – 3m x 1.5m; S_4 – 5m x 5m (control) and different fertigation levels *viz.,* F_1– 75:75:75 g NPK/plant; F_2 - 150:150:150g NPK / plant; F_3 - 225:225:225g NPK / plant. It was inferred that a combination of S_2 F_1 (3 m × 1 m; 75:75:75g NPK / plant) was the best nutrient management practice for recorded higher productivity (56.87 t / ha) with better quality parameters.	During 2017-18, confirmatory trial was undertaken. In the confirmatory trial also, the same treatment S_2F_1 (3 m × 1 m; 75:75:75 g NPK/plant) registered better yield (55.76 t / ha) and quality attributes.	For 2018 - 19, treatments with different pruning intensities will be initiated.	Technology for higher productivity through adoption of optimum spacing, fertigation schedule and pruning levels will be standardized for commercial adoption.

Project No.& Title		Canopy management in HDP & UHDP				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Training and pruning in different growth stages	Dr. J. Rajangam Prof. and Head (Fruits) Dr. C.Subesh Ranjith Kumar Asst.Prof.(Hort.) HC & RI, Periyakulam	Guava variety L- 49 and Lalit were planted under UHDP.	The plants were trained for uniform frame work and flowering. Observation on growth parameters was recorded.	Imposition of the treatments and observation to be continued.	Technology for canopy management under HDP and UHDP will be evolved.
Project No.& Title		**HCRI/TRY/HOR/FRU/2014/003** Standardization of fertigation schedule in high density planting of guava cv. L – 49 under alkaline soil				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Standardization of fertigation schedule for HDP in guava cv. Lucknow-49 under alkaline soil	Dr.J.Auxcilia, Assoc.Prof. (Hort.) HC & RI (W), Trichy	Guava cv. Lucknow - 49 was planted at a spacing of 3 x 1.5 m in December-2013 - January 2014 in an area of 0.92 ha. In the initial three years, the plants were allowed to establish. Pruning for the summer season crop (March- April 2018) was done in the month of October, 2017. The fertigation schedule for the crop was given as detailed below: T1: 100% of RDF as fertigation T2: 75% of RDF as fertigation T3: 50% of RDF as fertigation T4:100% of RDF as soil application Recommended Dose of Fertilizer: 480:240:240g of N: P_2O_5 and K_2Og/plant/year (4^{th} year dose). Application of 50 % of RDF as fertigation was found to be the best as against soil application of 100% RDF in terms of yield during the summer cropping season from March – April 2018.		Confirmatory trial is in progress.	HDP technology for Guava under alkaline soil will be standardized.

Crop: GRAPES						
Theme No and title		**Theme No 1:** Quality improvement in grapes				
Project No.& Title		**HCRI/TNI/HOR/FRU/2016/001** Quality improvement in grape *(Vitis vinifera* L.) var. Muscat Hamburg through special viticultural practices				
S.No.	**Theme Activity**	**Name of the Scientist(s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Effect of special viticulture practices *viz.*, cluster clipping and leaf removal and growth regulators *viz.,* gibbrellic acid and brassinolide on berry size, yield and berry quality traits in grapes var. Muscat Hamburg	Dr. S. Parthiban Prof. and Head Dr. K. Venkatesan Professor (CRP) GRS, Anaimalayanpatty	The treatment combination of retention of 9 leaves above the last cluster with the foliar application of 10 ppm GA_3 (at parrot green stage) and 0.5 ppm of homobrassinolide (V_2P_3) was found to be the best in terms of high yield (23.71 kg $vine^{-1}$) and quality (TSS 21.30^{o}Brix).		Confirmation trial is in progress.	Special viticultural practices to improve yield and quality in Muscat Hamburg (Panneer) will be evolved.

Theme No and title		Theme No 2: Management of berry cracking in grape var. Muscat Hamburg				
Project No.& Title		HCRI/TNI/HOR/FRU/2016/002; Studies on berry cracking and its management in grape *(Vitis vinifera* L.) var. Muscat Hamburg				
S.No.	Theme Activity	Name of the Scientist(s) and Centre	Year 2016-17 / Progress made	Year 2017-18 / Progress made	Year 2018-19 / Work plan	Deliverables
1.	Management of berry cracking in grapes with the use of calcium, boron, other secondary and micronutrients	Dr. S. Parthiban Professor and Head GRS, Anaimalayanpatty	The results revealed that foliar application of chelated EDTA Calcium @ 0.2 per cent combined with Boric acid @ 0.1 % (Treatment - T_5) was found to enhance yield (19.76 kg vine^{-1}), reduce berry cracking (3.50%), berry shattering (3.75%) and physiological loss in weight after 16 days of storage (90.15%) in summer pruned grapes.		Confirmatory trial is under progress.	Technology for reducing the crop loss due to berry cracking and improving storage life of grape variety Muscat Hamburg.
Theme No and title		Theme No 3: Standardization of pruning practices in grape var. Muscat Hamburg				
Project No.& Title		HCRI/TNI/HOR/FRU/2016/003 Studies on influence of season and bud level of pruning for double pruning and double cropping system in grape *(Vitis vinifera* L.) var. Muscat Hamburg				
S.No.	Theme Activity	Name of the Scientist (s) and Centre	Year 2016-17 / Progress made	Year 2017-18 / Progress made	Year 2018-19 / Work plan	Deliverables
1.	Studies on season and bud level of pruning for double pruning / double cropping system in grape var. Muscat Hamburg	Dr. A. Subbiah Assistant Professor(Hort.) GRS, Anaimalayanpatty	Summer pruning at 7th bud level and winter pruning at 3rd bud position registered higher values for shoot length, number of bunches and fruit yield per vine, TSS & lowest acidity.		The confirmatory trial is under progress.	Identification of optimum season and bud level for high fruitfulness and yield in grape var. Muscat Hamburg (Panneer)

Crop: JACKFRUIT						
Theme No and title		**Theme No 1:** Rapid multiplication of jackfruit				
Project No.& Title		Standardization of softwood grafting techniques in Jack fruit				
S.No.	**Theme Activity**	**Name of the Scientist (s) and Centre**	**Year 2016-17**	**Year 2017-18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Standardisation of softwood grafting techniques in Jack fruit	Dr.J.Rajangam, P&H Dr.C.Subesh Ranjith Kumar, AP (Hort.) Periyakulam	Root stock was raised and different propagation methods were studied.	Growth parameters and the best performing treatment with successful graft union success was recorded. Among the methods, the soft wood grafting performed well.	Microtome work and confirmation of results. In addition, field survival research will be imposed to assess the success percentage.	To find out the optimum age of the rootstock, method of propagation in jackfruit for commercial exploitation.

Vegetable Crops

I. General recommendations:

- Demonstration plots of vegetables may be established in all horticultural research stations.
- Proposal may be sent for Geographical index (GI) registration of local races of vegetables especially for brinjal (Professor & Head, VRS, Palur)
- Green chilli and mundu chili types may be evolved for regional specific cultivation (Professor & Head, Department of vegetable crops, HC&RI, Periyakulam)
- Agathi collections may be strengthened (Professor & Head, Department of vegetable crops, HC&R,I Periyakulam, KVK Sirugamani)
- Basic research on pollen sterility with respect to climate change in all possible vegetable crops may be studied (Professor & Head, Department of vegetable crops, HC&RI, Periyakulam & Coimbatore, Professor and Head, Dept. of Crop physiology, TNAU, Cbe.
- Book on GAP on vegetable crops should be prepared (Professor &Head Department of vegetable crops, HC&RI, Coimbatore and Periyakulam)
- Grafting in brinjal may be taken up with striped brinjal varieties (Professor &Head, Department of vegetable crops, HC&RI, Coimbatore)
- Rehydration and dehydration capacity of CO (On) 5 onion may be studied (Professor & Head, Department of vegetable crops, HC&RI, Coimbatore and Professor and Head, PHTC, Coimbatore)
- Large scale trial on cassava plantation may be taken up at Veddaranyam area (Professor &Head, TCRS, Yethapur)
- The molecules responsible for curing heart diseases in garlic may be studied and reported (Professor &Head, HRS, Ooty).

II. Staff pattern

Name of the Station	Man power			No. of ongoing UR projects	No. of Externally funded projects
	Main	AICRP	Total		
TNAU, Coimbatore	1 +2	5	8	11	2
HC & RI, Periyakulam	1+3	-	4	5	-
HC & RI (W), Trichy	1+3	-	4	4	-
AC & RI, Madurai	1	-	1	5	1
AC&RI, Killikulam	1	-	1	2	-
VRS, Palur	1+1	-	2	4	-
TCRS,Yethapur	0	1	1	4	-
ARS, Virinjipuram	1	0	1	1	-
ARS, Vaigai Dam	1	-	1	3	-
SWMRI, Thanjavur	1	-	1	1	-
Total	**18**	**6**	**24**	**40**	**3**

WORK LOAD OF VEGETABLE SCIENTISTS FOR THE YEAR 2018-2019

I. Department of Vegetable Crops, HC&RI, TNAU, Coimbatore

S.No	Scientists	Research (%)	Teaching (%)	Extension (%)	Students guide (%)	Administration (%)	Other Activities (%)	% of time
1.	Dr.T.Arumugam	20	20	10	20	20	10	100
2.	Dr.P.Irenevethamoni	25	25	15	25		10	100
3.	Dr.S.Praneetha	35	25	10	15		15	100
4.	Dr.G.V.Rajalingam	25	30	25	10		10	100
5.	Dr.V.Rajasree	60	15	5	10		10	100
6.	Dr. K. Shoba Thingalmaniyan	50	20	5	5		20	100
7.	Dr. P.R. Kamalkumaran	50	10	10	5		25	100
8.	Dr. H. Usha Nandhini Devi	40	25	5	-		30	100
9.	Dr. M. Karthikeyan	50	20	10	5		15	100

II. Department of Vegetable Crops, HC&RI, Periyakulam								
S.No	Scientists	Research (%)	Teaching (%)	Extension (%)	Students guide (%)	Administration (%)	Other Activities (%)	(%) of time
1.	Dr. L. Pugalendhi	30	20	10	10	30		100
2.	Dr.P. Paramaguru	30	20	10	10	30		100
3.	Dr.V. Lakshmanan	30	30	10	20		10	100
4.	Dr. P. Geetharani	30	30	10	-		30	100
5.	Dr. J. Sheela	30	30	10	-		30	100
III. HC&RI, Trichy								
1.	Dr. S. Jeeva	28	57	5			10	100
2.	Dr. G. Malathi	55	35	5			5	100
IV. Vegetable Research Station, Palur								
1.	Dr. L. JeevaJothi	20	-	15	-	40	25	100
2.	Dr. V. Paramasivam	30	-	20	-	-	50	100
3.	Dr. K. Sakthivel	60	-	20	-	-	20	100
V. Tapioca and Castor Research Station, Yethapur								
1.	Dr. M. Velmurugan	70	10		5	-	15	100

III. Remarks on ongoing university research sub projects
Crop Improvement

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
UNIVERSITY RESEARCH PROJECTS			
I	**TOMATO**		
1.	HCRI/CBE/HOR/VEG/2015/007 Development of pre breeding line in tomato resistant / tolerant to peanut bud necrosis virus through interspecific hybridization. Period: January 2015 to December 2017	Dr. A. Beaulah, Asst. Prof. (Hort.) Dept. of Vegetable Crops, HC &RI, Coimbatore.	Completion report shall be submitted
2.	HCRI/CBE/HOR/VEG/2015/008 Development of indeterminate high yielding, hybrid/variety in Tomato (*Solanum lycopersicum* Mill) suitable for Poly House/Open filed Condition. Period: June 2015 to May 2018	Dr. V. Premalakshmi, Asst. Prof. (Hort.) Dept. of Vegetable Crops, HC &RI, Coimbatore.	Work shall be continued to develop indeterminate F_1 hybrids suitable for poly house/ open field condition
3.	HCRI/PKM/HOR/VEG/2017/002 Development of F_1 hybrids in tomato with green shoulder, high keeping quality and resistant to TLCV. Period: December 2017 to November 2020	Dr. V.A. Sathiyamurthy Associate Professor (Horticulture) Dr. J. Sheela Professor (Plant Pathology)	Hybridization and evaluation of hybrids to be continued
II	**BRINJAL**		
4.	HCRI/CBE/HOR/VEG/2014/006, Development of spineless brinjal hybrid akin to VRM 1 Mullukathiri. Period: December 2014 to December 2017	Dr. P. Irene Vethamoni Professor (Hort.) Dept. of Vegetable Crops, HC &RI, Coimbatore	Completion report shall be submitted immediately.
5.	HCRI/CBE/HOR/VEG/2016/001, Development of brinjal F_1 hybrid with purple and green striped fruits for high yield and shoot and borer fruit resistance. Period: May 2016 to April 2019	Dr.S.Praneetha, Professor (Hort.) Dept. of Vegetable Crops, HC &RI, Coimbatore	Hybridization and evaluation of hybrids to be continued

6.	HCRI/MDU/HOR/VEG/10/002, Development of hybrid derivative in Brinjal using local types. Period: July 2013 to June 2016	Dr. P.Balasubramanian Asst. Prof. (Hort.) Dept. of Horticulture, AC&RI, Madurai – 625 104	Completion report shall be submitted
7.	CPBG/PAL/PBG/VEG/2017/New, Development of brinjal hybrids with high yield and nematode resistance. Period: March 2017 to February 2022	Dr. K. Sakthivel Asst. Prof. (PBG) Dr. I. Cannayane Asst. Prof. (Nematology) Dr. L. JeevaJothi Professor (Hort.) and Head VRS, Palur	The identified types should be artificially tested in the sick plot for nematode resistance before taking crossing work.
8.	HCRI/VIJ/HOR/VEG/2014/001, Evolution and evaluation of high yielding non-spiny brinjal types with the quality characters of spiny Brinjal. Period: November 2014 to October 2017	Dr. B. K. Savitha Asst. Prof. (Hort.) ARS, Virinjipuram.	Completion report shall be submitted
9.	HCRI/TRY/HOR/VEG/2015/001, Collection, screening and breeding of brinjal under salt affected soils. Period: April 2015 to March 2019	Dr.G.Malathi, Asst. Prof. (Hort.) Dr.H. Vijayaraghavan, Prof. (Plant physiology) HC&RI (W), Trichy	Collected genotypes shall be evaluated both under field and artificial condition for yield, quality and salt tolerance
10.	Collection, conservation and evaluation of *Solanum torvum* Swartz. genotypes for high alkaloid and less antinutritional content. Period: April 2018 to March 2021	Dr.A.Beaulah Associate Professor (Hort.) Dept. of Horticulture Mrs.A.Kavitha Pushpam Asst. Prof. (Bio.chem) Dept. of Biotechnology AC & RI, Madurai	Project shall be continued to evaluate the genotypes for high alkaloid content Project number may be obtained.

III	**CHILLI**		
11.	HCRI/TRY/HOR/VEG/2014/001, Collection, screening and breeding of chilli (*Capsicum annuum* L.), genotypes under salt affected soils. Period: April 2014 to March 2018	Dr.G.Malathi, Asst. Prof. (Hort.) Dr. T. Kalaimagal Professor (PBG) HC&RI (W), Trichy	Collected genotypes shall be evaluated both under field and artificial condition for yield, quality and salt tolerance
12.	HCRI/CBE/HOR/VEG/2016/002, Screening of chilli germplasm for yield, quality and tolerance to Leaf Curl Virus. Period: December 2016 to November 2019	Dr. H.Usha Nandhini Devi, Asst. Prof. (Hort.) Dr. S. Harish, Asst. Prof. (Pl. Patho.) Dept. of Vegetable Crops, HC&RI, TNAU, Coimbatore	Screening for yield, quality and LCV resistant shall be continued to identify the resistant types. The F_1 seeds available in the Department of Vegetable Crops may also be screened for LCV resistance
IV	**OKRA**		
13.	HCRI/MDU/HOR/VEG/14/003, Development of F_1 hybrids in okra (*Abelmosches esculentus* L.) for yield, quality and resistance to YVMV. Period: July 2014 to June 2017	Dr. R.Arun Kumar, Asst. Prof. (Hort.) KVK, AC&RI, Madurai	Completion report shall be submitted
V	**BOTTLE GOURD**		
14.	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: October 2015 to September 2018	Dr. K. Sakthivel, Asst. Prof. (PBG) VRS, Palur	Collected genotypes shall be evaluated for selection of parents and hybridization to be carried out to develop hybrids.
VI	**RIDGE GOURD**		
15.	HCRI/CBE/HOR/VEG/2014/003, Development of RIL's (Recombinant Inbred Lines) of cluster bearing, small fruited hermaphrodite ridge gourd [*Luffa acutangula (Roxb.)L]*, Period: Period: December 2014 to April 2019	Dr. V.Rajashree, Asst. Prof. (Hort.) Dept. of Vegetable Crops, HC&RI, TNAU, Coimbatore	Work shall be continued to identify the best RIL's with cluster bearing, small fruited hermaphrodite ridge gourd
16.	HCRI/MDU/HOR/VEG/2016/001, Developing F_1 hybrid in Ridge gourd with high yield and quality. Period: Sep 2016 – Aug 2019	Dr. V. Krishnamoorthy Asst. Professor (Hort). AC&RI, Madurai	Hybrid evaluation to be continued

VII	**CUCUMBER**		
17.	HCRI/PKM/HOR/VEG/2015/001 Survey, Collection and salad cucumbers(*Cucumis* sp) Period: December 2014 to November 2017	Dr. J. Prem Joshua, Professor (Hort.), Department of Horticulture, AC&RI, Killikulam.	Confirmatory experiments of the selected genotypes to identify the suitable salad cucumber. Extension of the project shall be obtained
VIII	**BITTER GOURD**		
18.	HCRI/PKM/HOR/VEG/2017/001, Development of F_1 hybrids in bitter gourd for better yield and quality. Period: October. 2017 to September 2020	Dr. R. Balakumbahan, Asst. Prof. (Horticulture) Dept. of Veg Crops Dr. J. Sheela, Prof. (Plant Pathology) Dept. of Veg Crops	Hybridization and evaluation of hybrids to be continued
IX	**ONION**		
19.	HCRI/EKT/HOR/VEG/2014/001, Evaluation of onion varieties suitable for New Cauvery Delta Zone. Period: December 2014 to November 2016	Dr. M. Visalakshi, Asst. Prof. (Hort.) AC&RI, Eachangottai, Thanjavur	Completion report shall be submitted
IX	**CLUSTER BEAN**		
20.	HCRI/TRY/HOR/VEG/2014/001, Collection and evaluation of Cluster bean (*Cyamopsis tetragonoloba*) genotypes under salt affected soils. Period: August 2014 to July 2017	Dr. R.Jagadeesan, Asst. Prof. (Hort.), HC&RI (W), Trichy.	Completion report shall be submitted
X	**BUTTER BEANS**		
21.	HCRI/PKM/HORVEG/2014/003, Developing a high yielding variety of butter beans through mutation breeding. Period: July, 2014 to June 2018	Dr. B. Senthamizh Selvi Asst. Prof. (Hort.) HRS, Kodaikanal.	Completion report shall be submitted
XI	**CASSAVA**		
22.	HCRI/YTP/HOR/VEG/2015/001, Breeding of cassava for high tuber yield and starch content. Period: December 2015 to November 2018	Dr.M.Velmurugan, Asst. Prof.(Hort.) Dr.S.R.Venkatachalam, Professor and Head, TCRS, Yethapur	Project shall be continued to evaluate the genotypes for high tuber yield and starch content

23.	**HCRI/YTP/HOR/VEG/2017/001** Evaluation of suitable cassava variety for rainfed ecosystem in hilly areas of Tamil Nadu. Period: August 2017 to August 2020	Dr.M.Velmurugan, Asst. Prof.(Hort.) TCRS, Yethapur	Project shall be continued
XIII	**AMARANTHUS**		
24.	**HCRI/TRY/HOR/VEG/2016/001,** Evaluation of underutilized leafy vegetables in salt affected soils for leaf yield and phytoremediation effect. Period: January 2016 to March 2019	S.Jeeva Professor (Hort.) HC&RI (W), Trichy.	Project shall be continued to identify the suitable underutilized leafy vegetables in salt affected soils
XIV	**AROIDS AND YAMS**		
25.	HCRI/PPI/HOR/VEG/2016/001, Collection, characterization and Screening of edible tuber crops, aroids and yams. Period: January 2016 to December 2019	Dr.C.Vijulan Harris Professor (Hort.) HRS, Pechiparai.	Completion report shall be submitted

II. CROP MANAGEMENT

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
I.	**TOMATO**		
1.	NRM / MDU / SAC / VEG / 2016 / 001 Effect of different EC levels of irrigation water on the yield and quality of tomato. Period: June 2016 to May 2019	Dr.G.Sridevi, Asst. Prof. (SS&AC) Department of Soil and Environment, AC & RI, Madurai	The project work shall be continued
2.	NRM / PAI / SAC / VEG / 2015 / 001 Studies on plant tissue analysis as a diagnostic tool for correcting nutrient deficiency and higher productivity in tomato. Period: October 2015 to October 2017	Dr. A. Renukadevi, Asst. Prof. (SS &AC) RRS, Paiyur	Completion report shall be submitted
3.	DCM / PAI / CRP / VEG / 2016 / 001 Physiological manipulation of source sink relationship in tomato. Period: June 2016 to June 2018	Dr. R. Sivakumar Assistant Professor (Crop Physiology) Regional Research Station, Paiyur	Completion report shall be submitted
II.	**BRINJAL**		
4.	NEW - 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: December, 2017 – November, 2019	V. Paramasivam Professor(SST) Vegetable Research Station, Palur	The project work shall be continued to confirm the research findings
III.	**CHILLI**		
5.	NRM / CBE / SAC / VEG / 2014 / 001 Studies on the yield and quality of chillies and onion as influenced by S fertilization in S deficient soils. Period: July 2014 to June 2017	Dr. J. Balamurugan Asst. Prof. (SS&AC) Department of SSAC, Cbe.	Completion report shall be submitted
IV.	**BHENDI**		
6.	SEED / CBE / SST / VEG / 2017 / 001 Studies on effect of seed coating formulation for root traits and its influence on seed yield of bhendi in varied fertilizer level. Period: November 2017 to October 2019	Dr.C.Menaka Asst. Professor (SST) Dept. of Seed Science and Technology Tamil Nadu Agricultural University Coimbatore - 641 003	Name of the project leader should be changed and the project shall be continued
V.	**ASH GOURD**		
7.	SEED / VGD / SST / VEG / 2015 / 001 Effect of after ripening period and seed after ripening treatments on seed germination and seedling emergence of Ash gourd cv. CO 1. Period: October 2015 to September 2017	Dr. D.Thirusendura Selvi Asst. Prof. (SS&T) Dr. S.Saraswathy, Professor (Hort.), ARS, Vaigai Dam	Completion report shall be submitted

VI.	**SNAKE GOURD**		
8.	SEED / PLR / SST / VEG / 2017 / 001 Standardization of seed extraction techniques for snakegourd (*Trichosanthes cucumerina* L) and bottlegourd (*Lagenaria siceraria* Mol.) Period: January, 2017 to December, 2018	V. Paramasivam Professor(SST) Vegetable Research Station, Palur	Completion report shall be submitted
VII.	**CUCUMBER**		
9.	HCRI / CBE / HOR / VEG / 2014 / 004 Studies on training systems in cucumber under poly house Period: August 2014 to July 2017	Dr. G.V. Rajalingam, Asst. Prof. (Hort.) Dept. of Vegetable crops, HC &RI, TNAU, Coimbatore.	Completion report shall be submitted
VIII.	**COCCINIA**		
10.	HCRI/CBE/HOR/VEG/2014/001 Standardization of nutrient requirement through fertigation for Coccinia (*Coccinia grandis*) variety TNAU coccinia CO1. Period: October 2014 to September 2017	Dr.K.Shoba Thingalmaniyan, Asst. Prof. (Hort.)Dept. of Veg. Crops, HC & RI, TNAU, Coimbatore Dr. P. Malathi, Asst. Prof. Dept. of SSAC, Coimbatore	Completion report shall be submitted
IX.	**ONION**		
11.	HCRI / VGD / HOR / VEG / 2015 / 001 Seasonal influence on growth and seed yield of small onion cv. CO (On) 5 under Vaigaidam conditions. Period: October 2015 to September 2017	Dr. S.Saraswathy, Professor (Hort.) Dr. D.Thirusendura Selvi, Asst. Prof. (SS&T) ARS, Vaigai Dam	Completion report shall be submitted
12.	SEED / VGD / SST / VEG / 2015 / 002 Management practices to improve the seed yield and productivity in small onion cv. CO (On) 5. Period: May 2015 to April 2018	Dr. D. Thirusendura Selvi, Asst. Prof. (SS&T) Dr. S.Saraswathy, Professor (Hort.), ARS, Vaigai Dam	Completion report shall be submitted
13.	HCRI /KKM/HOR/VEG/ 2015 / 001 Studies on influence of growth retardants in increasing yield and quality of Bellary onion (*Allium cepa* var.cepa) Period: December 2015 to November 2018	Dr.J.Prem Joshua, Professor (Hort.) Dept. of Horticulture, AC & RI, Killikulam	The project work shall be continued
X.	**GARLIC**		
14.	DCM / OTY / AGR / SPC / 2015 / 001 Integrated weed management in garlic (*Allium sativum* L.) under rainfed condition Period: May 2015 to February 2018	Dr. K. Ramamoorthy, Professor (Agronomy), HRS, Ooty	Completion report shall be submitted

15.	DCM / OTY / AGR / SPC / 2017 / 001 Biological measures for soil and water conservation for sustainable crop production of garlic in high rainfall areas of Nilgiris district. Period: November 2017 to October 2020	Dr. K. Ramamoorthy, Professor (Agronomy), HRS, Ooty	The project work shall be continued
XI.	**VEGETABLE COWPEA**		
16.	DCM / PKM / AGR / VEG / 2015 / 003 Study of foliar spray and fertilizer levels on yield of vegetable cowpea (PKM 1) Period: April 2015 to June 2017	Dr. M.P. Kavitha Asst. Prof. (Agronomy) HC & RI, Periyakulam	Completion report shall be submitted
XII.	**LAB LAB**		
17.	HCRI / CBE / HOR / VEG / 2015 / 008 Studies on effect of growth regulators on growth, flowering and yield of bush type lab lab (*Lablab purpureus (L.)*) Period: February 2015 to January 2018	Dr. K. Kumanan, Asst. Prof. (Hort.) Dept. of Veg. Crops, HC &RI, TNAU, Coimbatore	Completion report shall be submitted
XIII.	**CASSAVA**		
18.	NRM / YTP / SAC / VEG/ 2013 / 002 Permanent manurial experiment on cassava in red sandy loam soil (*Typic Rhodustalf*) of Yethapur under irrigated situation. Period: December 2013 to November 2018	Dr. S. Suganya, Asst. Prof. (SS&AC) TCRS, Yethapur.	Completion report shall be submitted
19.	NRM / YTP / SAC / VEG / 2017 / 001 Evaluation of new micronutrient fertilizer mixture for increasing the productivity and starch content in cassava. Period: March 2017 to February 2019	Dr. S. Suganya, Asst. Prof. (SS&AC) Dr. D. Jegadeeswari, Asst. Prof. (SS&AC) TCRS, Yethapur.	The project work shall be continued for confirmatory trials.
XIV	**ORGANIC PRODUCTION**		
20.	NRM / CBE / ENS / VEG / 2016 / 001 Enhancing the productivity of vegetables in an organic production system. Period: August 2016 to July 2018	Dr.A.Barani Assistant Professor (ENS) Dept.of Sustainable Organic Agriculture, TNAU,Coimbatore -3 Dr. M.P. Kavitha Assistant Professor (Agronomy) Dept. of Vegetable Crops, Periyakulam.	Completion report shall be submitted.

IV. Cultures under MLT / ART / FLD

I. Varieties / hybrids proposed for submission to variety release committee, 2018

1. Garlic As 72 (ART)

The accession As 72 was evaluvated for four years(2014-2018).The pooled analysis of four years data showed that the As 72 recorded the maximum values for plant height (67.92 cm) with erect green foliage, number of leaves (6.75), equatorial diameter of bulb (45.78 mm), polar diameter of bulb (42.39 mm), number of cloves (16.09) and yield (16.94 tonnes / ha), followed by As 11 (13.70 tonnes/ha) over the local check As-1 (Ooty – 1). Among the 72 entries, the accession As 72 recorded the maximum TSS content (47 ◦ brix), allicin (3.87 µg/g of sample) and polyphenol content (3.08 µg/g of sample) followed by As 11 recorded next best values for TSS (42◦ brix), allicin (3.16 µg/g of sample) and polyphenol content (3.49 µg/g of sample)

The adaptive research trial for Garlic As 72 culture were conducted during the year 2016 – 17 in 45 farmers field in Ooty, Coonoor, Kotagiri and Gudalur blocks of the Nilgiris district. The variety Ooty-1 was used as check for comparison. The overall performance of the culture As 72 showed that it recorded 30.15 kg yield/plot, whereas, Ooty-1 recorded 24.67 kg yield/plot. The overall per cent increase in yield over check is 22.31. As per the proceeding of the UVTRSC date: 21.12.2017, Adaptive Research Trial was conducted for the garlic As 72 in Erode (20 locations) and Dindigul (20 locations) district. Seed production of As 72 was carried out during the year 2017-18 at Horticultural Research Station, TNAU, Ooty in an area of 0.75 acre and fresh bulb yield was obtained @ 3.50 tonnes/ acre. **(Source: HCBE- OTY- VEG- 10- 002)**

2. Bottle gourd Ls 44 (ART)

It is a selection, from local types collected from Uchimedu, with round fruit without bottleneck, very appealing light green fruit colour. High yielding (41.15 t/ha) with excellent taste. Average fruit weight is around 975 g. Ideal for small and medium family. Best for traditional vegetable lovers. It produces high marketable fruits and lower level of incidence of pest and diseases**.** Seeds of LS 44 and check variety were sent to 11 districts on 10.01.2018 for conducting ART II.Trials are in progress.Seeds were also sent to KVK, Vamban and KVK, Vridhachalam for conducting ART II. **(Source: CPBG/ PAL/ PBG/ VEG / 2011 / 001)**

3. Onion Aca 15 (ART)

Screening of aggregatum onion germplasm was done to identify a seed propagated aggregatum onion with short duration. Over the five years of evaluation the Aca 15, a selection from Puttarasal type recorded the highest bulb yield of 22.84 t /ha which is 22.32 % increase over the check CO (On) 5. The bulbs of Aca 15 are bold and pink colored with high TSS of 18.04 º brix. 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. Seeds of Aca 15 and check variety CO (On) 5 have been sent to 12 districts of Tamil Nadu to conduct ART in 120 locations during January 2018 **(Source: AINPROG / HOR / CBE / VEG / 001)**.

4. Tomato CTH 1 (ART)

It is a F_1 hybrid of LE 127 x LE 239. Fruits are flat round with green shoulder, each fruit weigh about 75.3 g. The plant yields 32.1 fruits with average fruit weight of 75.0 g. The yield potential of the hybrid was 96.0 t/ha which is 22.6 % increased yield over COTH 3 (78.3 t/ha) and 26.3 % increased yield over Lakshmi (76.0t/ha). It is moderately resistant to leaf curl virus (10.5 PDI). The TSS of the fruit was 6.30 º brix and the ascorbic acid content is 30.43 mg/100 g .It also recorded an extended shelf life period of 40 days under the storage temperature of 8ºC. Seeds of CTH 1 along with check hybrids *viz.,* COTH 3 and Lakhmi have been sent to 21 districts of Tamil Nadu to conduct ART in 135 locations **(Source: AICRP/HOR/CBE/VEG/008)**

II. Varieties / hybrids proposed for ART, 2018

1. Brinjal hybrid derivative (HD 10-6-5-3)

Brinjal hybrid derivative (HD 10-6-5-3) was selected from a cross Singampunari Local x Annamalai. This hybrid derivative possesses a plant height of 85.16 cm with 22.17 branches / plant. Each plant bears 39.14 fruits each weighing 47.50 g. The fruit is white in color with purple stripes which is locally called as Palgiri. Consistent yield was observed in the past seven generation with a potential yield of 2.12 kg /plant. It is highly suitable for local market of Southern district. The hybrid derivative recorded18.59 % and 36.64 % infestation of shoot and fruit borer, respectively besides, recording 18.45 % little leaf incidence **(Source: ACMD /MDU/HOR /10/002)**.

III. Varieties / hybrids proposed for MLT II, 2018

1. Cassava Me 681 (MLT 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 three years yield data revealed that the mean tuber yield per plant was 7.61 kg with the starch content of 29.80%. It is a dual purpose cassava accession suitable for edible purpose and for industrial use. It recorded the grade 1 to 2 for Cassava mosaic virus. Harvesting can be done at 10 months. Planting materials of Me 681 and check varieties has been sent to 17 centres for the conduct of MLT. **(Source**: **AICRP /HOR /CBE /VEG/009)**.

V. ACTION PLAN

a. Crop Improvement

Tomato

Theme No. 1: Germplasm characterization, evolving trait specific genotypes and development of hybrids for open field and polyhouse condition						
Theme Leader: Dr. T. Arumugam, Prof. and Head, Dept. of Vegetable Crops, Coimbatore						
Sub theme 1: Screening of germplasm for yield, quality, processing and biotic tolerance.						
No	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1	Characterization and field screening of tomato germplasm for yield, quality (TSS, Lycopene, Ascorbic acid) and biotic stress tolerance (TLCV and nematodes)	**Coimbatore** **Horticulturist** Dr. V. Premalakshmi **Pathologist** Dr. M. Karthikeyan **Entomologist** Dr. T. Ilaya Bharathi **Nematologist** Dr. P. Vetrivelkalai **Biotechnologist** Dr. M. Raveendran	Germplasm pooling, characterization and performance assessment for yield, quality, TLCV and nematode tolerance	Promising genotypes LE 355 and LE 525 have been identified with high lycopene and β carotene content. Three root knot nematode resistant hybrids *viz.,* IC 249503 X HN 2, LE 812 X HN 2 and Arka Abhay x HN 2 have been developed	Confirmatory trial and selection of the best performing genotype with high quality and yield . Performance evaluation of nematode resistant hybrids	Identification of trait specific genotype / hybrids
Sub theme 2: Development of high yielding hybrids for polyhouse cultivation						
No	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1	Evolving high yielding hybrids suitable for polyhouse cultivation	**Coimbatore** **Horticulturist** Dr. V. Premalakshmi **Pathologist** Dr. M. Karthikeyan **Entomologist** Dr. T. Ilaya Bharathi	Selection of parents and effecting crosses	Punjab Sartaj x EC163605, EC160885xEC163605, IIHR2042 x EC163683 and IHR2042 x EC163605 were identified as promising hybrids	Confirmatory evaluation of hybrids for growing under polyhouse condition	Identification of superior hybrid with high yield and suitable for polyhouse cultivation

Chilli						
Sub theme 3: Development of high yielding hybrids with resistance to TLCV in tomato						
No	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1	Evolving high yielding hybrids with resistance to TLCV in tomato	**Periyakulam** **Horticulturist** Dr. P.Paramaguru Dr. V. A. Sathiyamurthy **Pathologist** Dr. J. Sheela **Entomologist** Dr. M.Kannan	-	Sixty three genotypes are collected and evaluated	Effecting crosses and development of hybrids and evaluation of F1 hybrids	Identification of superior hybrid with high yield and TLCV resistance
Theme No. 1: Germplasm characterization, evolving trait specific genotypes and development of hybrids/varieties						
Theme Leader: Dr. T.Arumugam, Professor and Head (Hort.), Dept. of Veg Crops, HC&RI, Coimbatore						
Sub theme 1: Screening of germplasm for yield, quality and biotic tolerance						
No	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1	Characterization and field screening of chilli germplasm for yield, quality (capsaicin and ascorbic acid) and biotic tolerance (thrips, mites, LCV and anthracnose)	**Coimbatore** **Horticulturist** Dr. H. Usha Nandhini Devi **Entomologist** Dr. T. Ilaya Bharathi **Pathologist** Dr. M. Karthikeyan **Physiologist** Dr.K.B. Sujatha **Biotechnologist** Dr. Raveendran	Germplasm pooling, characterization and performance assessment for yield, quality and thrips, mites, LCV and anthracnose tolerance under irrigated condition	The accessions CA7 and M08 were identified for high yield	Trial to be continued for further screening	Identification of trait specific genotypes suitable for irrigated conditions

Brinjal

Theme No 1: Germplasm characterization, evolving trait specific genotypes and development of hybrids/varieties						
Theme Leader: Dr. K. Nageswari, Prof & Head, Vegetable Research Station, Palur						
Sub theme 1: Screening of germplasm for yield, quality, biotic and abiotic resistance						
No	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1	Characterization and field screening of brinjal germplasm for yield, special morphological traits (shape, size, colour, glossiness, plain/stripes and thorn less), quality (devoid of bitterness) shoot and fruit borer tolerance	**Coimbatore** **Horticulturist** Dr.B.K.Savitha **Entomologist** Dr. T. Ilaya Bharathi **Pathologist** Dr. M. Karthikeyan **Biotechnologist** Dr. M. Raveendran	Germplasm pooling, characterization and performance assessment for yield, quality and biotic stress tolerance	Hybrids of golden green types and green with white striped fruit types have been developed. Parents of purple & purple and white striped fruit types were selected for hybridization .	Hybridization and evaluation	Identification of trait specific genotypes / hybrids
2	Evolving high yielding hybrids with nematode tolerance	**Palur** **Horticulturist** Dr. K.Nageswari **Breeder** Dr. K.Sakthivel **Nematologist** Dr. K.Senthamizh	Screening and identification of nematode tolerant genotypes	Evaluation and selection of nematode tolerant parents and effecting crosses	Evaluation of hybrids under open field condition and artificial screening for nematode tolerance	Identification of superior hybrids with nematode tolerance
3	Characterization and field screening of brinjal germplasm for yield, quality and salt tolerance	**Trichy** **Horticulturist** Dr. G. Malathi **Pathologist** Dr. S.Sangeetha **Entomologist** Dr. M. Chandrasekaran **Soil scientist** Dr. S Sheeba	-	Collected 30 genotypes and evaluated for saline tolerance	Evaluation to be continued	Identification of superior genotypes with high yield, quality and salt tolerance

Bhendi

Theme No 1: Germplasm characterization and identification of trait specific genotypes						
Theme Leader: Dr. A.Beaulah, Assoc. Prof, Dept of Horticulture, AC&RI, Madurai						
Sub theme 1: Screening of germplasm for yield, quality, and biotic stress						
No	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
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) and Yellow Vein Mosaic resistance	**Madurai** **Horticulturist** Dr. R. Arun Kumar Dr.A.Beaulah **Pathologist** Dr.S.Harish **Coimbatore** **Horticulturist** Dr.T. Arumugam Dr. K. Shoba Thingalmaniyan **Pathologist** Dr. M. Karthikeyan	Germplasm pooling, characterization and performance assessment **(Madurai and Coimbatore)**	Kamini x EC755656 and Kamini x EC 755657 were identified as promising hybrids at Madurai. Four YVMV resistant genotypes have been identified through field screening and artificial screening is in progress at Coimbatore.	Confirmatory evaluation to be taken up at Madurai. Artificial screening to be continued at Coimbatore	Identification of hybrids for high yield and YVMV resistance

Cassava

Theme No 1: Evolving cassava variety for high tuber yield and starch content						
Theme Leader: Dr. M. Velmurugan, Assistant Professor (Hort.), TCRS, Yethapur						
Sub theme 1: Screening of cassava accessions under rainfed ecosystem in hilly areas						
No.	**Activity**	**Center and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1.	Evolving alternate cassava variety suitable for hilly areas of Tamil Nadu	**TCRS, Yethapur** **Horticulturist** Dr. M. Velmurugan	-	Trial was initiated in Kalrayan hills to study the performance of identified accessions / pre-release cultures with the ruling varieties for high tuber yield and starch content. The crop is in tuber maturation phase.	Trial will be continued.	Identification of suitable genotypes to replace the existing low yielding and mosaic susceptible variety H 165.

Sub theme 2: : Screening of cassava accessions with high tuber yield, starch content and tolerance to salt injury in plains						
No.	**Activity**	**Center and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
	Evaluation of cassava genotypes for salt tolerance	**TCRS, Yethapur** **Horticulturist** Dr.M.Velmurugan **Soil Scientist** Dr. S. Suganya	-	Me 681 and TCMS 7 were identified as salt tolerant genotypes based on preliminary artificial screening.	Field level screening will be carried out for salinity tolerance.	Identification of suitable cassava genotypes for tolerance to salt injury

Gourds						
Theme No:1. Development of hybrids/varieties with high yield and quality						
Theme Leader: Dr. P. Paramaguru, Prof (Hort.) Dept. of Vegetable Crops, HC&RI, Periyakulam						
Sub theme 1a: Screening of germplasm (Bitter gourd) and development of F1 hybrids						
Sl. No.	**Activity**	**Centers and Scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1.	Characterization and field screening of bittergourd germplasm (Long and dark green fruits with prominent tubercles) and development of hybrids	**Periyakulam** **Horticulturist** Dr. P. Paramaguru Dr. R. Balakumbahan **Pathologist** Dr.J.Sheela	-	Thirty two bitter gourd genotypes were collected and evaluated	Evaluation and selection of parents and crossing programme to be taken up	Identification of high yielding hybrids

Sub theme 1b: Developing high yielding hybrids with small and cylindrical fruits (Bottle gourd)						
1.	Evolving high yielding hybrids with small and cylindrical fruits	**Palur** **Horticulturist** Dr. K.Nageshwari **Breeder** Dr. K. Sakthivel	-	16 genotypes were selected as parents	Hybridization, and performance assessment of hybrids	Identification of high yielding hybrids in bottle gourd
Sub theme 1c: Developing high yielding small sized hybrids with high flesh thickness and beta carotene in pumpkin						
	Developing high yielding small fruit sized hybrids with high flesh thickness and β carotene	**Coimbatore** **Horticulturist** Dr. V.Rajasree **Biotechnologist** Dr. Kumaravadivel	Best parents were selected and hybridization was taken up and evaluated	The hybrids Saras x Pusa Viswas, Ambili x Pusa Viswas and were identified for small fruit size (1.7& 1.10kg) high flesh thickness (3.8 & 2.1 cm) with high β carotene (89.60 & 28.06 μg/g)	Conducting large scale trials	Evolving high yielding hybrids with small fruits, high flesh thickness and β carotene

b. Crop Management

Theme No. 1: Organic cultivation practices for vegetables						
Theme Leader: Dr. S. Jeeva, Professor (Horticulture) HC&RI(W), Trichy.						
Sub theme 1: Standardization of organic production technology for greens						
No	**Activity**	**Centers and scientists**	**2016-17**	**2017-18**	**2018-19**	**Deliverables**
1	Organic production of green leafy vegetables	**Horticulturist** Dr.S.Jeeva **Soil scientist** Dr. S.Sheeba	Application of organic manures inputs and assessment of growth and yield	Soil application with vermicompost (4t/ha) + liquid nitrogenous biofertilizer (*Azospirullum* 200ml/acre) + foliar spray of vermiwash (3%)) recorded highest yield and quality with increased shelf life	Confir matory trial and OFT	Standardization of organic production technology for green leafy vegetables
Theme 2: Standardization of growth promoting formulations to enhance yield and quality in vegetables						
Theme leader : Dr. S.Suganya , Asst. Professor (Horticulture), TCRS,Yethapur						
Sub theme 4: Standardization of growth promoting nutrient mixture to enhance the starch content and yield of cassava						
1	Evaluation of micro nutrient mixture for increasing the productivity and starch content in cassava	**TCRS,Yethapur** **Soil scientist** Dr.S.Suganya Dr.D.Jegadeeswari, AP (SS&AC)	-	Field experiment was initiated with three different grades of micro nutrient mixtures at five doses. The crop is in tuber initiation stage.	Performance assessment of micro nutrient mixtures for increasing the productivity and starch content of cassava	Standardization of growth promoting nutrient mixture to enhance the starch content and yield in cassava

Spices and Plantation Crops

I. General Recommendations

- Turmeric varieties from North eastern states of India may be collected and added to the existing germplasm

(Action: Dr. B.Senthamizh Selvi, Asst. Prof. (Hort.), HC&RI, Coimbatore)

- Survey may be conducted in Tamil Nadu for assessing the purpose for which turmeric is cultivated

(**Action: Dr.P. Hemalatha, Asst. Prof. (Hort.), ARS, Bhavanisagar)**

- Kasturi manjal types having medicinal value may be collected and added to the germplasm

(Action: Dr. B.Senthamizh Selvi, Asst. Prof. (Hort.), HC&RI, Coimbatore)

- Turmeric rhizome architecture may be studied

(**Action: Dr.P. Hemalatha, Asst. Prof. (Hort.), ARS, Bhavanisagar)**

- Essential oil composition of curry leaf genotypes available in the germplasm may be studied
- Curry leaf genotypes from southern districts of Tamil Nadu may be collected and added to the existing germplasm

(Action: Dr. N. Shoba, Professor (Hort.), HC&RI, Coimbatore and

Dr. D. Vidhya, Asst. Professor (Hort.), HC & RI (W), Trichy)

- Multicut type / variety of coriander from Thondamuthur, Palladam and also Vilathikulam types of coriander (high essential oil type) may be collected and added to the existing germplasm.

(Action: Dr.R. Chitra, Asst. Prof. (Hort.), HC&RI, Periyakulam)

- Performance of ginger as intercrop in coconut may be studied

(Action: Dr.V. Sivakumar, Asst. Prof. (Hort.), CRS, Aliyarnagar)

2. Staff pattern

Station	Designation	Discipline						Total
		Hort	PAT	ENT	PBG	AGR	SSAC	
Dept. of Spices and Plantation Crops, HC & RI, Coimbatore	Prof.	3						3
	AP	3 **(1 AICRP)**	1 **(AICRP)**					4
Dept. of Spices and Plantation Crops, HC & RI, Periyakulam	Prof.	1						1
	AP	1			1		1	3
HC & RI(W), Trichy	AP	1		1				2
HRS, Ooty	AP	1	1					2
HRS, Yercaud	AP	1 **(AICRP)**						1
HRS, Pechiparai	Prof.	1						1
	AP	1						1
HRS, Thadiyankudisai	Prof.	1	1	1				3
	AP	1						1
CRS, Aliyarnagar	Prof.	1		1				2
	AP	1 **(AICRP)**	1 **(AICRP)**	1 **(AICRP)**		1 **(AICRP)**	1	5
ARS, Bhavanisagar	AP	1						1
CRS, Veppankulam	AP	1 **(AICRP)**	1 **(AICRP)**			1 **(AICRP)**		3
RRS, Vridhachalam	AP	2 **(AICRP)**						2
Total		**21**	**5**	**4**	**1**	**2**	**2**	**35**

Among the 35 Scientists, 23 are working in Non Plan main three are working in ICAR-AICRP on spices, seven are working in ICAR – AICRP on Palms and two are in ICAR -AICRP on cashew.

Among the 23 scientists working in non-plan, five are Professor and Head, two are Professors in horticulture, one in Pathology, two in Entomology, eight are Asst. Professors in Horticulture, one in Plant breeding and genetics, one in Plant Pathology, one in Agrl. Entomology and two in Soil Science and Agrl.Chemistry.

WORK LOAD OF SPICES AND PLANTATION CROPS SCIENTISTS FOR THE YEAR 2018-19

S.No	Scientists	Research (%)	Teaching (%)	Extension (%)	Students guide (%)	Administration (%)	Other Activities (%)	% of time
1.	Dr. S. Balakrishnan	22	20		20	30	8	100
2.	Dr.A. Ramar	20	20	25 (Farm Professor)	20		15	100
3.	Dr.N. Shoba	20	20	25 (PG coordinator)	20		15	100
4.	Dr. V. Jegadeeswari	45	20		10		25	100
5.	Dr.B. Senthamizh Selvi	62	20		10		8	100
6.	Dr. M. Mohanalakshmi	15	25	30 (Farm Manager)	10		20	100
7.	Dr.C. Ushamalini	55	20		20		5	100
8.	Dr. P. Arul Arasu	10	10	20 (Farm)	5		55	100
9.	Dr.S. Karthikeyan	40		10			50	100
10.	Dr.K. Venkatesan	40		20		30	10	100
11.	Dr.M. Sivakumar	85					15	100
12.	Dr.P. Hemalatha	40	20				40	100

2. Remarks on the ongoing university research projects

S.No.	Name of the Scientist	Project No. &title	Remarks
Crop Improvement			
1.	Dr. P. Hemalatha Asst. Prof. (Hort.) ARS, Bhavanisagar Period: July 2015 to June 2018	HCRI/BSR/HOR/SPC/2015/003 Breeding of **turmeric** for high yield and quality	• The promising culture BS 9 may be tested in an area of 25 to 50 cents at ARS, Bhavanisagar and HC & RI, TNAU, Coimbatore to confirm the yield performance. • Pest and disease incidence may be recorded • The quality traits may be analysed for the turmeric culture BS 9
2.	Dr. B. Senthamizh Selvi Asst. Professor (Hort.) Dept. of Spices & Plantn. Crops,HC&RI, Coimbatore Period: June 2016 to May 2019	HCRI/CBE/HOR/SPC/2016/007 Induction of variability in **turmeric** (*Curcuma longa* L.) through gamma rays	• Project may be continued
3.	Dr.A.Ramar, Professor(Hort.) Dept. of Spices & Plantn Crops, HC&RI, Coimbatore Period: October 2016 to September 2019	HCRI/CBE/HOR/SPC/2016/004 Evaluation of mutant lines in **ginger** (*Zingiber officinale* Rosc.) for yield and quality	• Project may be completed and • Completion report may be submitted
4.	Dr. S. Karthikeyan Asst. Prof. (Hort.) & Dr.S.Malathi Asst.Prof. (Pl. Path.)HRS, Ooty Period: June 2015 to May 2017	HCRI/CBE/HOR/SPC/2015/003 Evaluation of **ginger** (*Zingiber officinale*) genotypes for high yield and resistance to soft rot suitable for Gudalur regions in Nilgiris district	• Project may be completed and new proposal may be submitted for continuation of the project • Ginger collections from CSIR- Institute of Himalayan Bioresource Technology, Palampur, Himachal Pradesh may be included in the ginger germplasm of HRS, Ooty (HREC, Gudalur)
5.	Dr.V.Sivakumar AP (Hort.) Period: December 2013 to November 2018	CPBG/ALR/ PBG/ SPC/ 2013/ 001 Evaluation of **ginger** genotypes under Coconut ecosystem	• Project may be continued

6.	Dr. B. Senthamizh Selvi Asst. Prof. (Hort.) Dept. of Spices & Plantation Crops, HC&RI, Coimbatore Period: June 2016 to May 2019	HCRI/CBE/HOR/SPC/2016/006 Induction of mutagenesis in coriander *(Coriandrum sativum* L.) through gamma ray and EMS for variability and quality improvement.	• Project may be closed
7.	Dr. S. Santha Asst. Prof. (PB&G) Dr. R. Chitra Asst.Prof. (Hort.) Dept. of Spices & Plantn. Crops, HC&RI,PKM Period: October 2017 to September 2020	New Project: Identification of coriander genotype with high yield and quality	• Project number to be obtained and the project may be continued
8.	Dr. M. Ananthan, Professor & Head HRS, Thadiyankudisai Period: October 2017 to September 2020	New Project: Collection and evaluation of **Black Pepper** (*Piper nigrum* L.) genotypes for yield and qualities under lower Pulney conditions.	• The Project number to be obtained and the project may be continued • Project number may be obtained
9.	Dr. N. Shoba Professor (Hort.) Dept. of Spices & Plantn Crops, HC&RI, Coimbatore. Period: June 2014 to May 2018	HCRI/CBE/HOR/SPC/2014/003 Germplasm collection, evaluation and assessment of **curryleaf** genotypes for yield and quality parameters	• Extension proposal may be submitted • Essential oil composition of curry leaf genotypes available in the germplasm may be studied • Curry leaf genotypes from southern districts of Tamil Nadu may be collected and added to the existing germplasm
10	Dr. D. Vidhya Asst. Prof. (Hort.) HC&RI (W), Trichy Period: May 2015 to March 2018	HCRI/TRY/HOR/VEG/2015/003 Collection and evaluation of **curryleaf** (*Murraya koenigii* Spreng.) genotypes for saline soil	• Extension proposal may be submitted • Essential oil composition of curry leaf genotypes available in the germplasm may be studied • Curry leaf genotypes from southern districts of Tamil Nadu may be collected and added to the existing germplasm

11.	Dr. M. Mohanalakshmi Asst. Prof. (Hort.) Dept. of Spices & Plantn. Crops,HC&RI, Coimbatore Period: December 2014 to November 2018	HCRI/CBE/HOR/SPC/2014/003 Evaluation and characterization of **coconut** genotypes for yield and quality	• Project may be completed and completion report may be submitted
12.	Dr. K.S. Vijayselvaraj Asst. Prof. (Hort.) CRS, Veppankulam Period: October 2014 to September 2019	HCRI/TRY/HOR/SPC/2014/005 Evaluation of **coconut** hybrids for high quality tender coconut	• The yield of nuts and quality of tender coconut water of the identified hybrids may be recorded. • The project may be continued
Crop Management			
13.	Dr. S.Balakrishnan Professor and Head Dept. of Spices & Plantn. Crops HC&RI, Coimbatore Period: July 2014 to June 2018	HCRI/CBE/HOR/SPC/2014/002 Standardization of fertigation schedule for **turmeric** (*Curcuma longa* L.) transplants	• Extension proposal may be submitted and project may be continued
14.	Dr. T.Chitdeshwari Professor (SS&AC) TNAU, Coimbatore Period: October 2015 to September 2019	NRM/CBE/SAC/SPC/2015/001 Developing and evaluating new micronutrient mixtures for improving the yield and quality of **turmeric**	• Completion report may be submitted
15.	Dr. R. Swarnapriya Professor and Head HRS, Pechiparai Period: October 2014 to September 2017	HCRI/PPI/HOR/SPC/2014/004 Studies on yield intensification in **bush pepper (** *Piper nigrum***)**	• Completion report may be submitted for this project • A new project on bush pepper may be proposed for standardizing nutrient schedule.
16.	Dr. S. Muthuramalingam Asst. Prof. (Hort.) HRS, Thadiyankudisai Period: August 2017 to July 2020	HCRI/TDK/HOR/SPC/2013/003 A comparative study on non conventional method of bush management on yield and quality of **black pepper** (*Piper nigrum*) under lower pulney hills	• The project may be continued

17.	Dr. K. Venkatesan Professor & Head CRS , Aliyar Period: October 2013 to July 2016	HCRI/ALR/HOR/SPC/2013/001 Standardization of planting material in **pepper** to grow as intercrop in coconut garden	• Completion report may be submitted and proposal for a new project may be submitted
18.	Dr. M. Palanikumar Asst. Prof. (Hort.) HRS, Pechiparai Period: July 2010 to March 2017	HCRI/PPI/HOR/SPC/2010/001 High density planting in **clove**	• Completion report may be submitted and proposal for a new project may be submitted
19.	Dr. R. Chitra Asst. Professor (Hort.) Dr. D. Janaki Asst. Professor (SS&AC) Dept. of Spices & Plantn Crops, HC&RI,PKM Period: Oct 2017– Sep 2020	HCRI/PKM/HOR/SPC/2017/001 Effect of Organic manures and Bio-stimulants on growth and yield of **curry leaf** (*Murraya koenigii*)	• The project may be continued
20.	Dr. S. Rani Asst. Prof. (Agro.) CRS, Aliyarnagar Period: June 2016 to May 2018	DCM/ALR/AGR/SPC/2014/001 Effect of water soluble fertilizer and shredded coconut waste on **dwarf coconut**	• The project may be closed and completion report may be submitted
21.	Dr. V. Jegadeeswari Asst. Prof. (Hort.) Dept. of Spices & Plantn. Crops HC&RI, Coimbatore Period: June 2016 to May 2018	HCRI/CBE/HOR/SPC/2016/003 Evaluation of **cocoa** (*Theobroma cacao* L.) under different coconut system	• The project may be completed and completion report may be submitted
22.	Dr. C. Sudhalakshmi Asst. Prof. (SS&AC) CRS, Aliyarnagar Period: April 2015 to May 2019	NRM/ALR/SAC/SPC/ 2015 / 001 Standardization of micronutrient recommendation for **cocoa** under coconut intercropping systems	• Based on the observations made and data generated, suitable micronutrient combination may be formulated and evaluated as envisaged in the objective. The project may be continued

23.	Dr.S.Velmurugan Asst. Prof. (Hort.) RRS , Virudhachalam Period: June 2016 to May 2019	HCRI/VRI/HOR/SPC/2016/001 Studies on canopy management in ultra high density planting system of **cashew**	• The project may be continued
CROP PROTECTION			
24.	Dr. K.Rajamanickam Professor (Agrl. Entomology) CRS, Aliyarnagar Period: July 2015 to June 2018	CPPS/ALR/ENT/SPC/2015/002 Reaction of location specific new coconut hybrids (D x T, T x D & T x T), exotic, local tall ecotypes and dwarf cultivars against coconut pests for exploitation of resistance	As the project duration is over by June 2018 , completion report needs to be submitted. New URP may be proposed
25.	Dr. M. Alagar, Asst.Professor (Entomology), Coconut Research Station, Aliyarnagar Period: May 2017 to April 2020	CPPS/ ALR/ ENT/ SPC/ 2017 / 001 Studies on the population dynamics and management of Rugose spiralling whitefly, *Aleurodicus rugioperculatus* Martin in coconut	Project may be continued
26.	Dr. C. Ushamalini Asst.Prof. (Pl. Path.) Dept. of Spices and Plantation Crops, HC & RI, Coimbatore Period: June 2015 to May 2018	CPPS/CBE/PAT/SPC/2015/001 Development of management practices for ginger rhizome rot by bio control agents and fungicides	Project completion report may be submitted. Recommended for OFT
27.	Dr. R. Ramjegathesh Asst. Prof. (Pl. Path.) CRS, Aliyarnagar Period: July 2014 to June 2017	CPPS/ALR/PAT/SPC/2014/001 Evaluation of fungicides and different methods of application for the management of leaf blight disease of coconut	The project work may handed over to Pathologist at CRS, Aliyar for continuation
30.	Dr. R. Ramjegathesh Asst. Prof. (Pl. Path.) CRS, Aliyarnagar Period: January 2016 to January 2019	CPPS/ALR/PAT/SPC/2016/001**.** Documentation of hot spot areas and optimization of management strategies for coconut root (wilt) disease in Tamil Nadu,	The project work may handed over to Pathologist at CRS, Aliyar for continuation

4. Cultures under MLT/ART/FLD

Culture identified for evaluation under MLT

Sl. No.	CROP	MLT/ART	Name of the Department/ Station
1.	Turmeric	**MLT** Culture - BS.9 Checks- BSR 1, BSR 2 & CO 2	Agricultural Research Station, Bhavanisagar
Name of the MLT centres		1. Horticultural College & Research Institute, Coimbatore 2. Tapioca and Castor Research Station, Yethapur	

Traits to be observed

1. Weight of the mother rhizome (kg/plant)
2. Weight of the finger rhizome (kg/plant)
3. Rhizome yield (kg/plant)
4. Rhizome yield (kg/plot)
5. Estimated yield (t/ha)
6. Curcumin content (%)
7. Pests and disease incidence

Culture identified for evaluation under ART

Sl. No.	CROP	MLT/ART	Name of the Department/ Station
1.	Coriander	**ART** 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

Trait to be observed:

i. Herbage yield (kg/plot)
ii. Estimated herbage yield (kg/ha)

Culture identified for OFT

1. CPPS/CBE/PAT/SPC/2015/001 Development of management practices for ginger rhizome rot by bio **control agents and fungicides**

(Action taken: 1. Dr.C.Ushamalini, AP (Pl.Pathology), HC&RI, Coimbatore,
2. Dr. Dr.S.Malathi, AP (Pl.Pathology), HRS,Ooty,
3. Dr. Dr. A. Vijayasamundeeswari, AP (Pl.Pathology), HC&RI, Periyakulam

5. Action plan - 2017-2019

Crop improvement

Theme No.1 : Development of varieties in spices for high yield and quality								
Sub theme I : Germplasm enrichment, evaluation and screening of black pepper genotypes and varieties suitable for lower Pulney hills								
Theme leader : Professor and Head, Horticultural Research Station, Thadiyankudisai								
S. No.	**Activity**	**Scientists and centres**	**Year1 2016-17**	**Year2 2017-18**	**Year 3 2018-19**	**Year 4 2019-20**	**Year 5 2020-2021**	**Deliverables**
1	Assembling and screening of promising black pepper genotypes and varieties through clonal selection	**HRS, Thadiyankudisai** Dr.M. Ananthan, Horticulturist,TKD Dr. Muthaiah Entomologist, TKD Dr. I.Yesuraja, Pathologist,TKD	Survey and collection of promising genotypes and recently released varieties	Evaluation of promising pepper genotypes and varieties for morphological traits under field conditions	Studies on the performance of promising pepper genotypes and varieties	Screening of pepper genotypes and varieties for high yield, quality, pest & disease tolerance	Assessment of yield and quality of different genotypes and varieties suitable for lower Pulney hills	Identifying promising genotypes and varieties for high yield and quality suitable for lower Pulney hills.

Theme No.1 : Development of varieties in spices for high yield and quality								
Sub theme II: Development of varieties of turmeric for high yield and high curcumin content through selection and mutation breeding								
Theme leader: Dr. S. Balakrishnan, Professor and Head, Department of Spices and Plantation Crops, HC&RI, Coimbatore								
S. No.	**Activity**	**Scientists and centres**	**Year1 2016-17**	**Year2 2017-18**	**Year 3 2018-19**	**Year 4 2019-20**	**Year 5 2020 -2021**	
1.	Evaluation and clonal selection	**HC&RI, Coimbatore** Dr.S. Balakrishnan, Horticulturist, Cbe Dr.B. Senthamizh Selvi, Horticulturist, Cbe Dr. C. Ushamalini, Pathologist, Cbe Dr. T. Elaiyabharathi, Entomologist,Cbe	Conducting MLT with promising genotype BS - 9 along with check BSR-1, BSR-2 and CO 2. (ARS, BSR)	Conducting MLT-2 with the promising genotype BS -9 (ARS, BSR)	Conducting MLT at HC&RI, Coimbatore and TCRS, Yethapur (ARS, BSR)	Conducting ART (ARS, BSR)	Conducting ART (ARS, BSR)	**Deliverables** Developing high yielding varieties / mutants with high curcumin content
2.	Mutation breeding	**ARS, Bhavanisagar** Dr. P. Hemalatha, Horticulturist, BSR	Evaluation of genotypes and varieties for high yield and curcumin content (HC&RI, CBE)	Induction of mutation in selected genotypes and evaluation of mutant population (vM_1 generation) (HC&RI, CBE)	Evaluation of vM_2 generation (HC&RI, CBE)	Evaluation of vM_3 generation (HC&RI,CBE)	Evaluation of vM_4 generation (HC&RI,CBE)	

Theme No.1 : Development of varieties in spices for high yield and quality						
Sub theme III : Development of ginger varieties for high yield and tolerance to soft rot through selection						
Theme leader : Dr. K. Venkatesan, Professor and Head, CRS, Aliyarnagar						
S. No.	**Activity**	**Scientists and centres**	**Year1 2016-17**	**Year2 2017-18**	**Year 3 2018-19**	**Deliverables**
1	Assembling and screening of promising ginger genotypes and varieties through clonal selection	**HREC, Gudalur** Dr. S. Karthikeyan, Horticulturist,HRS, Ooty Dr. S. Malathi, Pathologist, HRS, Ooty (CRS, Aliyarnagar) Dr. K. Venkatesan,Horticulturist, Aliyarnagar Dr. M. Sivakumar, Horticulturist, Aliyarnagar	• Evaluation of genotypes and varieties for high yield and field tolerance to soft rot • Enriching the germplasm (HREC, Gudalur)	Enrichment of ginger genotypes and further evaluation. (HREC, Gudalur)	Conducting confirmatory trial (HREC, Gudalur)	Developing high yielding varieties / mutants with high field tolerance to soft rot disease
			• Evaluation of genotypes and varieties for high yield and field tolerance to soft rot under coconut ecosystem • Enriching the germplasm (CRS, Aliyarnagar)	Enrichment of ginger genotypes and further evaluation. (CRS, Aliyarnagar)	Conducting confirmatory trial (CRS, Aliyarnagar)	

Theme No.1 : Development of varieties in spices for high yield and quality						
Sub theme IV : Development of coriander varieties for high yield and quality						
Theme leader : Dr. P. Jansirani, Professor and Head, Dept. of Spices and Plantation Crops, HC&RI, Periyakulam						
S. No.	**Activity**	**Scientists and centres**	**Year1 2016-17**	**Year2 2017-18**	**Year 3 2018-19**	**Deliverables**
1	Evaluation of promising coriander genotypes and varieties for seed and leaf purpose	**HC& RI, Coimbatore** Dr. B. Senthamzih Selvi, Horticulturist, Cbe Dr. C. Ushamalini, Pathologist , Coimbatore	• Evaluation of available genotypes and varieties for seed and leaf purpose • Conducting ART for the identified high yielding leafy coriander culture CS 38 (HC&RI Coimbatore)	Conducting ART for the identified high yielding leafy coriander culture CS 38 (HC&RI, Coimbatore)	Proposing for variety release (HC&RI, Coimbatore)	Identification of promising types of coriander for high yield and quality

Theme No.1 : Development of varieties in spices for high yield and quality								
Sub theme IV : Development of coriander varieties for high yield and quality								
Theme leader : Dr. P. Jansirani, Professor and Head, Dept. of Spices and Plantation Crops, HC&RI, Periyakulam								
S. No	**Activity**	**Scientists and centres**	**Year1 2017-18**	**Year2 2018-19**	**Year 3 2019-20**	Year 4 2020 - 21	**Year 5**	**Deliverables**
	Evaluation of promising coriander genotypes and varieties for seed and leaf purpose	**HC&RI, Periyakulam** Dr. P. Jansirani, Horticulturist, Periyakulam Dr. R. Chitra , Horticulturist, Periyakulam Dr. S.Santha , Asst. Prof. (PB&G)	Evaluation of genotypes and varieties for yield and quality under rainfed condition (HC&RI, PKM)	Continued (HC&RI, PKM)	Continued (HC&RI, PKM)	Conducting MLT (HC&RI, PKM)	Conducting ART (HC&RI, PKM)	Identification of promising types of coriander for high yield and quality

Theme 1 : Development of varieties in spices for high yield and quality						
Sub theme V : Germplasm collection, evaluation and selection of curry leaf genotypes for high yield and quality						
Theme leader : Dr. N. Shoba, Professor (Hort.)						
S. No.	**Activity**	**Scientists and centres**	**Year1 2016-17**	**Year2 2017-18**	**Year 3 2018-19**	**Deliverables**
1	Collection, evaluation and selection of curry leaf genotypes for high yield and quality	**HC&RI, Coimbatore** Dr. N. Shoba, Horticulturist Dr. C. Ushamalini, Pathologist	• Survey and collection of promising genotypes of curry leaf • Scoring for biotic stress tolerance	• Assessing the performance of the genotypes • Scoring for biotic stress tolerance	• Assessing the performance and selection of promising genotypes for high yield and quality • Scoring for Biotic stress tolerance	Selection of promising curry leaf genotypes for high yield and quality
2.	Collection, evaluation and selection of curry leaf genotypes for high yield and quality suitable for alkali soil condition of Trichy	**HC&RI (W), Trichy** Dr.D.Vidhya, Horticulturist Dr. M. Chandrasekaran, Entomologist	• Survey and collection of promising genotypes and varieties • Scoring for biotic stress tolerance	• Evaluation of promising genotypes for alkali soil tolerance • Scoring for biotic stress tolerance	Assessing the performance and selection of promising genotypes for alkali soil and field tolerance to pest and disease	Identifying superior genotypes suitable for alkali soil

Theme 1 : Development of varieties in spices for high yield and quality								
Sub theme VI : Germplasm collection, evaluation and selection of nutmeg genotypes for high yield and quality								
Theme leader: Dr. R. Swarnapriya, Professor and Head, Horticultural Research Station, Pechiparai								
S. No.	**Activity**	**Scientists and centres**	**Year1 2016-17**	**Year2 2017-18**	**Year 3 2018-19**	**Year 4 2019 -20**	**Year 5 2020-21**	**Deliverables**
1	Collection, evaluation and selection of nutmeg genotypes for high yield and quality	**HRS, Pechiparai** Dr. M. Palanikumar, Horticulturist, PPI **HRS, Yercaud** Dr.P.Arularasu,Horticulturist, YCD **HRS, Thadiyankudisai** Dr.S.Muthuramalingam , Horticulturist, TKD Dr. I.Yesuraja, Pathologist, TKD Dr. C.Muthiah, Entomologist, TKD	• Germplasm enrichment and evaluation of available genotypes for high yield and quality • Conducting MLT for the culture MF4	Continued Continued	Continued Continued	Continued Continued	Continued Continued	Identification of elite genotypes for high mace yield and quality

Crop Management

Theme No.2 : Developing improved agrotechniques for increasing the productivity of spices						
Sub theme I : Developing agrotechniques for Bush pepper under HDP system						
Theme leader : Dr. R. Swarnapriya, Professor and Head, Horticultural Research Station, Pechiparai						
S. No.	**Activity**	**Scientists and centres**	**Year1** 2016-17	**Year2** 2017-18	**Year 3** 2018-19	**Deliverables**
1	Standardization of agrotechniques for Bush pepper under HDP	**HRS, Pechiparai** Dr. M. Palanikumar, Horticulturist,	Planting bush pepper under HDP	Adopting improved agrotechniques *viz.,* Training, pruning, canopy management, drip fertigation, foliar spray of micronutrients	Assessing the yield and quality	Developing improved techniques for increasing the productivity of bush pepper under HDP system

Theme No.2 : Developing improved agrotechniques for increasing the productivity in spices						
Sub theme II : Standardization of fertigation schedule for turmeric transplants						
Theme leader : Dr..S. Balakrishnan , Professor and Head, Dept. of Spices and Plantation Crops, HC&RI, Coimbatore						
S. No.	**Activity**	**Scientists and centres**	**Year1** 2016-17	**Year2** 2017-18	**Year 3** 2018-19	**Deliverables**
1.	Standardization of fertigation schedule for turmeric transplants	**Coimbatore** Dr.S. Balakrishnan,Horticulturist Dr.B.Senthamizh Selvi, Horticulturist Dr. D. Jayanthi, Assoc. Prof. Soil Scientist	Scheduling of drip fertigation and standardization of fertigation intervals	Continued	Conducting confirmatory trials	Standardizing the fertigation schedule for turmeric transplants

Department of Floriculture and Landscaping

General remarks

1. Nematode management has to be studied in tuberose (Action: Dept. of Floriculture, TNAU, Coimbatore)
2. The ideal production technologies for cultivation of *Jasminum nitidum* has to be standardized (Action: Dept. of Floriculture, TNAU, Coimbatore)
3. Planting of *Jasminum grandiflorum* has to be carried out in administrative block -approach road towards farmers residency (Action: Dept. of Floriculture, TNAU, Coimbatore)
4. A model lawn area to be established at the Botanical Gardens (Action: Dept. of Floriculture, TNAU, Coimbatore)

1) Staff Pattern

Station	Designation	Staff position	Biotechnologist
Floriculture and Landscaping, HC & RI, Coimbatore			
	Professor (Hort)	2	
	Associate Professor (Hort) (AICRP)	1	
	Assistant Professor (Hort) (AICRP)	1 1	1
HRS, Ooty			
	Associate Professor (Hort)	1	
	Assistant Professor (Hort)	1	
	Assistant Professor (Hort)	1	
Floriculture and Landscaping ,HC&RI, Periyakulam			
	Professor	1	
	Assistant Professor (Hort)	1	
FRS, Thovalai			
	Professor (Hort)	1	

WORK LOAD OF SCIENTISTS FOR THE YEAR 2018-19

S.No.	Scientist Name	Univ. Sub Projects (%)	AICRP/ external funded projects (%)	Teaching (%)	Student guidance (%)	Other activities Administration, farm/ ODL courses/lab in-charge (%)	Total (%)
I	**HC&RI, Coimbatore**						
1.	Dr. S. Subramanian	15	-	20	20	45	100
2.	Dr.A.Sankari	10	30	20	10	30	100
3.	Dr.P.Aruna	15	20	20	20	25	100
4.	Dr.S.P.Thamaraiselvi	10	30	20	20	20	100
5.	Dr.K.Hemaprabha	20	-	30	20	30	100
II	**HC&RI, Periyakulam**						
1.	Dr.Thangaselvabai	15	-	30	20	35	100
2.	Dr.Preethi	15	-	45	15	25	100
III	**HRS, Ooty**						
1.	Dr. M. Ganga	35	-	-	20	45	100
2.	Dr. M. Anand	10	40 + 30	-	-	20	100
3.	Dr. S. Karthikeyan	40	10	-	-	50	100
IV	**FRS, Thovalai**						
1.	Dr. J. Prem Joshua	40	-	-	-	60	100

2) Remarks on the ongoing University Research Projects

(i) Crop Improvement

S.No.	Project No. & Centre with Project Leaders	Title of the subproject	Duration	Remarks
1.	HCRI/CBE/HOR/FLO/2015/007 Dr. P. Aruna, AP (Hort.) HC & RI, Coimbatore	Evaluation of celosia genotypes for yield and quality	June, 2015 to March 2018	Germplasm collections may be enriched. Extension for one year may be obtained for conducting confirmatory trials
2.	HCRI/CBE/HOR/FLO/2013/006 Dr. M. Kannan HC & RI, Coimbatore	Development of varieties in hibiscus (*Hibiscus rosa-sinensis*) for high yield, quality and enhanced pigment content	June 2013 to May 2017	Approval for change of project leader may be obtained. Best performing accessions for high yield and pigment content will be identified
3.	HCRI/THO/HOR/FLO/2015/001 Dr. A. Jaya Jasmine, Prof. (Hort.) FRS, Thovalai	Collection and evaluation of lotus and lily genotypes suitable for loose flowers and for landscaping	Jan 2015 - Dec 2018	Proposal for change of project leader may be submitted. Water lily collections may be enriched with elongated petiole varieties/genotypes
4.	HCRI/ CBE/ HOR/ FLO/ 2015/ 008 Dr. M. Prabu, Asst. Prof. (Hort.) HC & RI, Coimbatore	Evaluation of warm season turf grasses for salinity tolerance under open field conditions	Oct.2015 to Sep.2018	Closure proposal may be submitted
5.	HCRI/CBE/HOR/FLO/2017/002 Dr. A. Sankari, Assoc. Prof. (Hort.) HC & RI, Coimbatore	Evaluation and clonal selection in under exploited Jasmine species	Sep 2017 to Aug 2020	ART and MLT trials may be continued for *Jasminum nitidum*. MLT/ART trials may be initiated for *J. multiflorum*

(ii) Crop Management

S.No.	Project No. & Centre	Title of the subproject	Duration	Remarks
1.	HCRI/CBE/HOR/FLO/2015/005 Dr.K.Hemaprabha Asst. Prof. (Ag. Biotech.), HC & RI, Coimbatore	Standardization of *in vitro* propagation protocol for mass multiplication in tuberose (*Polianthes tuberosa*)	January 2015 to March 2018	Closure proposal may be submitted
2.	HCRI/THO/HOR/FLO/2015/001 Dr. A. Jaya Jasmine, Prof. (Hort.) FRS, Thovalai	Standardization of agro techniques for commercial cultivation of orchids under Thovalai conditions	June 2015 - May 2018	Closure proposal may be submitted
4.	HCRI/OTY/HOR/FLO/2015/001 Dr.S.Karthikeyan, Asst. Prof. (Hort.) HRS, Ooty	Studies on the effect of calcium and boron on upper leaf necrosis in oriental lilium	June 2015 - May 2018	Closure proposal may be submitted
5.	HCRI/OTY/HOR/FLO/2015/002 Dr.M.Anand, Asst. Prof. (Hort.) HRS, Ooty	Standardization of spacing and nutrition management in Bird of paradise (*Sterlitiza reginae*) under open condition in Nilgiris	May 2017 - June 2018	Variety name of Bird of paradise may be mentioned in the subproject. Closure proposal may be submitted
6.	HCRI/PPI/HOR/FLO/2014/001 Dr.S.T.Bini Sundar, Asst. Prof. (Hort.) HRS, Pechipparai	Intercropping in rubber with flowering and foliage filler crops	April 2015 - October 2018	During CSM 2018 discussion session on Action Plan, instructions were given to close the sub- project as the mandate of the station was Spices research.
7.	HCRI/OTY/HOR/FLO/2017/001 Dr. M. Ganga, Assoc. Prof. & Head HRS, Ooty	Assessment of the performance of gladiolus (*Gladiolus grandiflorus*) under Nilgiris conditions	May 2017 - April 2019	The sub- project may be continued
8.	HCRI/CBE/HOR/FLO/2017/001 Dr. S. Subramanian, Prof. & Head, Dept. of Floriculture, HC & RI, Coimbatore	Effect of foliar application of humic acid and silisic acid on growth, yield and quality of marigold (*Tagetus erecta*) cv. coimbatore local yellow	Oct 2017 - Oct 2020	The sub- project may be continued

3) Details of ART/MLT conducted

(i) ART/MLT of *Jasminum nitidum*

The clone Acc.Jn-1 of *J. nitidum* (Star jasmine) has been identified as the most promising based on its desirable traits *viz*., year round flowering, good keeping quality, attractive bold buds, mild fragrance and higher consumer preference.

The adaptive research trial for *J. nitidum* ACC. Jn-1 culture was conducted in 29 farmers field in Coimbatore, Erode, Tirchy, Thanjavur,Tiruvannamalai, Thiruvallur, Vellore, Villupuram, Dharmapuri, Madurai and Dindigul. The *Jasminum grandiflorum* variety CO--1 was used as check for comparison. The overall performance of the culture *Jasminum nitidum* ACC.Jn-1 recorded an yield of 1.40 kg /plant/year whereas, *Jasminum grandiflorum* variety CO-1 recorded 1.04 kg /plant/year. The overall per cent increase over check is 33.1.The results of the trial conducted by Department of Horticulture are furnished below. The results of MLT conducted in 5 centres is furnished in Table 1 and month-wise flowering pattern of *J. nitidum Acc.Jn-1* is presented in Table 2. It was found that the culture *J. nitidum Acc.Jn*-1 found to be flowering throughout the year under Tamil Nadu conditions.

(a) MLT

MLT is in progress in the following 6 centres.

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

(b) ART

ART is in progress in 29 farmers' fields at Coimbatore, Erode, Tirchy, Thanjavur,Tiruvannamalai, Thiruvallur, Vellore, Villupuram, Dharmapuri, Madurai and Dindigul.

Table.1. Results of MLT on *Jasminum nitidum* ACC.Jn-1

S.No.	Name of the Research Station	Annual flower Yield (Kg/plant/year)		Per cent increase over the check
		J. nitidum ACC.Jn-1	*J. grandiflorum* CO-1	
1.	Agricultural Research Station Bhavanisagar	1.44	1.06	36
2.	Regional Research Station Paiyur	1.10	-	-
3.	Horticultural College &Research Institute , Periyakulam	1.32	1.19	11
4.	Floriculture Research Station Thovalai	0.8	0.71	13
5.	Horticulture College and Research Institute (Women) Trichy	1.43	-	-
		Overall mean		20

Age of the plant : 2 years Flowering season : *J. nitidum* – 12 months

***J. grandiflorum* – March - October**

Table 2. Month-wise yield data of *J.nitidum* ACC.Jn-1

Month	March 2017	April 2017	May 2017	June 2017	July 2017	Aug 2017	Sept 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Annual flower yield plant^{-1} (g)	Estimated annual flower yield ha^{-1} (t)
Yield (g/plant)	169.72	160.41	165.42	144.32	164.06	67.25	32.74	81.08	28.81	25.57	51.63	98.55	1189.56	3.96
Flowering performance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

✓: Yes, x: No

(ii) A new promising culture of *J. multiflorum* proposed during 2018-19

- Name of culture: Acc.Jm-1 of *J. multiflorum*
- *Check variety:* Kakada with white flower buds
- **Merits**
  - Year-round flowering with pink flower buds
  - Good yield (1.0kg/plant of 3 years old)
  - Offseason flowering nature (Nov-Feb)
  - Attractive plant architecture, ideal as decorative ornamental

S. No.	Jasmine genotype	Annual flower yield (4½ year old plants)		Consumer preference scoring
		Per plant yield (kg/plant/yr)	Estimated yield (t/ha/yr)	
1.	Acc. Jm-1 (*J. multiflorum)*	1.25	4.13	Excellent (4) (on par with CO.1 Jathimalli)
2.	Check variety CO.1 Jathimalli *(J. grandiflorum)*	2.70	8.90	Excellent (4)

4) Action Plan for 2018-2019 on the identified themes

I. CROP IMPROVEMENT

Jasmine

Theme : Germplasm collection, characterization and breeding						
Theme Leader: **Dr. A. Sankari, Assoc. Prof. (Hort.)**						
S. No	**Activity**	**Scientists and Centre**	**Year 1** (2016-17)	**Year 2** (2017-18)	**Year 3** (2018-19)	**Deliverables**
Sub Theme 1 : Screening of germplasm to identify promising types						
1.	Evaluation of the performance of clonal selection of Acc.Jn-1 *(Jasminum nitidum*) through MLT	**Coimbatore** Dr. A. Sankari	MLT in 7 centres and ART in 29 farmers field for *Jasminum nitidum,* ACC.Jn-1 culture (MTP) were conducted	Results of MLT and ART for the clone Acc. Jn-1 of *Jasminum nitidum* recorded year round flowering in 11 districts of Tamil Nadu	• Continuous evaluation of the performance of *J. nitidum* accession under ART/MLT • Variety release proposal will be submitted • Conduct of MLT/ART trials for *J. multiflorum*	Development of an improved clone of *Jasminum nitidum* for commercial cultivation

Minor flower crops (Celosia, Crossandra, Nerium, Hibiscus, lily and lotus)

Theme : Germplasm characterization and evaluation						
Theme leader : Dr. T. Thanga Selvabai, Prof. & Head, Dept. Floriculture and Medicinal Crops, HC & RI, Periyakulam						
S.No.	**Activity**	**Scientists and Centre**	**Year 1** (2016-17)	**Year 2** (2017-18)	**Year 3** (2018-19)	**Deliverables**
Sub Theme 1: Collection, characterization and evaluation of genotypes in *Celosia (Celosia* spp.*)*						
1.	Survey, collection, characterization and evaluation of genotypes for yield and quality	**Coimbatore** Dr. P. Aruna Asst. Prof. (Hort.)	Twenty accessions of *Celosia* types were collected from various districts of Tamil Nadu and planted for further evaluation	The collected genotypes were assessed for morphological and flowering parameters.	The project will be proposed for extension and confirmatory trials will be conducted to evaluate the superior performance of genotypes	Identification of promising high yielding *Celosia* types
Sub Theme 2: Germplasm characterization and mutation breeding in Crossandra (*Crossandra infundibuliformis*)						
1.	Evaluation of germplasm for yield, quality and nematode tolerance	**Periyakulam** Dr. T. L. Preethi	--	--	New sub project to be submitted.	Identification of promising types with enhanced yield, quality and tolerance to nematode
Sub Theme 3: Collection and evaluation of hibiscus genotypes						
1.	Collection and evaluation of hibiscus genotypes for high yield and pigment content	**Coimbatore** Dr. S.P. Thamarai Selvi	Fourteen accessions of *Hibiscus rosa-sinensis* were collected from different parts of TamilNadu and evaluated for morphological and yield characters.	On evaluating the fourteen accessions of *Hibiscus rosa-sinensis*, CHR 6, recorded the highest Anthocyanin yield and also the total antioxidant potential.	The superior performing accession for pot culture, high yield and pigment content will be identified	Identification of promising hibiscus types for pot culture, high yield and pigment content

Sub Theme 4:						
1.	Identification of novel lilly and lotus types for waterscaping	**Thovalai** **Horticulturist** Dr. Prem Joshua, Prof (Hort)	Seven lily and six lotus accessions were collected and established in the pond.	• The lily and lotus accessions collected have established well in the pond. • In the lily collection prolific growth and flowering was observed in all the accessions while in the natural ponds • In lotus, establishment was slow and is yet to flower.	Proposal will be submitted for change of project leader. Evaluation of superior accessions for flower form, colour and landscaping	Identification of novel types for attractive flower form and colour

II. CROP MANAGEMENT

Nerium

Theme : Development of agro techniques in Nerium *(Nerium oleander)*						
Theme Leader: Dr.T. Thangaselvabai**,** Professor and Head, Dept. of Floriculture, HC & RI, Periyakulam						
S.No.	**Activity**	**Scientists and Centre**	**Year 1** (2016-17)	**Year 2** (2017-18)	**Year 3** (2018-19)	**Deliverables**
Sub Theme 1 : Development of drip and fertigation techniques for Nerium						
1.	Effect of drip and fertigation on growth, yield and quality of Nerium (*Nerium oleander* L.)	**Periyakulam** • **Horticulturist** Dr.T.Thangaselvabai	--	--	New sub project to be submitted by Dept. of Floricutlure, Periyakulam	Optimization of drip and fertigation techniques for nerium

Marigold

Theme : Standardization of foliar nutrition techniques for high yield and quality in African Marigold						
Theme Leader: Dr. S. Subramanian, Prof. and Head, Dept. of Floriculture and Landscaping						
S.No.	**Activity**	**Scientists and Centre**	**Year 1** (2016-17)	**Year 2** (2017-18)	**Year 3** (2018-19)	**Deliverables**
Sub Theme 2: Standardization of foliar nutrition for African Marigold						
1.	Effect of foliar application of humic acid and silisic acid on growth, yield and quality of marigold (*Tagetus erecta*) cv. Coimbatore local yellow	**Coimbatore** Dr. S. Subramanian, Prof. and Head, Dept. of Floriculture and Landscaping	--	Sub project was obtained and the trial was initiated during January 2018	Experiment will be conducted along with confirmatory trials	Optimizing foliar nutrient application for high yield and quality in African Marigold

Gladiolus

Theme : Optimization of corm size and spacing for Gladiolus under Nilgiri conditions						
Theme Leader: Dr. M. Ganga, Assoc. Prof. and Head, HRS, Ooty						
S.No.	**Activity**	**Scientists and Centre**	**Year 1** (2016-17)	**Year 2** (2017-18)	**Year 3** (2018-19)	**Deliverables**
Sub Theme 3: Standardization of corm size and spacing for Gladiolus						
1.	Evaluation of gladiolus (*Gladiolus grandiflorus*) under Nilgiris conditions for corm size and spacing	Dr. M. Ganga, HRS, OOty	--	Ideal corm size and spacing requirement for gladiolus var. Sun Shine was standardized	Confirmatory trials will be conducted	Dissemination of gladiolus cultivation among farmers of Nilgiris District.

Medicinal & Aromatic Crops

1. General Remarks:

Glory lily:

- Germplasm collection has to be strengthened
- Microtuber technology may be tested in farmer's field

2. Staff pattern

Station	Designation	Number
Department of Medicinal & Aromatic Crops, HC & RI, Coimbatore		
	Professor (Hort.)	1 (Main)
	Assistant Professor (Hort.)	1 (Main)
	Assistant Professor (Hort.)	1 (ICAR)
	Assistant Professor (Plant pathology)	1 (ICAR)
	Assistant Professor (Agricultural Entomology)	1 (ICAR)
Floriculture and Medicinal Crops, HC & RI, Periyakulam		
	Professor (Hort.)	1 (Main)
	Professor (CRP_	1 (Main)

Work load of scientists for the year 2018-19
(% of work load)

S. No.	Scientist Name	Univ. Sub Projects	AICRP/external funded projects	Teaching	Student guidance	Other activities Administration, farm / ODL courses / lab in-charge	Total
I	**HC&RI, Coimbatore**						
1.	Dr. K. Rajamani	15	10	20	30	25	100
2.	Dr. L. Nalina	10	30	30	10	20	100
3.	Dr. I. Geethalakshmi	10	-	30	20	40	100
II.	**HC&RI, Periyakulam**						
1.	Dr. T. Thangaselvabai	10	10	20	10	50	100
2.	Dr. K. Venkatesan (CRP)	20	-	50	10	20	100

3. Remarks of the ongoing university research projects

S.No.	Project title	Remarks
1.	HCRI/CBE/HOR/MED/2015/001 Studies on induced mutation in glory lily (*Gloriosa superba* L.) for compact plant stature and high seed yield February,2015 to March,2018 Dr.S.Padmapriya, AP (Hort.)	• The mutants may be multiplied and tested for seed yield- OFT • Completion report to be sent
2.	HCRI/CBE/HOR/MED/2016/002 Characterization and evaluation of *Gymnema sylvestre* R.Br. January,2016toJanuary,2019 Dr.L.Nalina, AP(Hort)	• The promising cultures may be evaluated for one more season for leaf yield and gymnemagenin content. The cultures may be simultaneously multiplied for conducting MLT.
3.	SEED/KKM/SST/MED/2015/001 Influence of post harvest handling techniques on seed quality and storability of senna KKM (Se) 1 (*Cassia angustifolia* Vahl) July 2015 to June 2017 Dr. B.Venudevan Assistant Professor (SST) Dr.R.Geetha, Professor (SST)	The project is completed with the following salient findings and the completion report to be submitted. • For size grading, the seeds could be sieved with BSS 6x6 sieve size. • Accelerated ageing conditions (2 days) revealed the beneficial effects to increase the vigour and viability of seeds. • Senna seeds stored in 700 gauge polythene bag with polymer @ 3 g kg^{-1} of seed added with bavistin @ 2 g and imidacloprid @ 1 ml kg^{-1} of seed treatment proved to be the best practices for storing seeds with minimum loss in viability and vigour.
4.	DCM/MDU/AGR/MED/2017/001 Effect of sowing methods and seed rate on growth and yield of senna (*Cassia angustifolia*) in rice fallow condition Jan 2017 to May 2019	• Project may be continued; post-harvest analysis of soil has to be done.

4. Culture under ART

Solanum nigrum accession *S*n-19 (Kallipalayam local) is proposed for ART during 2018-19

On farm Technology

Microtuber technology in glory lily may be tested for seed yield

5. Action plan

Crop: *Salacia sp.*						
Theme No. and Title		**Theme : I. Development of a variety with high yield and quality traits**				
Theme Leader		Dr. K.Rajamani, Professor and Head, Dept. of Medicinal and Aromatic Crops, HC &RI, Coimbatore				
Project No & Title		Screening of germplasm to identify promising types				
S.No.	**Theme Activity**	**Name of the scientist(s) and centre**	**Year 2016-17**	**Year 2017– 18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Collection, characterization and evaluation of *Salacia* germplasm for root yield and quality traits	Dr. K.Rajamani, Professor and Head Dept. of Medicinal & Aromatic Crops, Coimbatore & Dr.R.Renuka Asst. Prof (Biotech), CPMB, TNAU, Coimbatore	Germplasm collection was initiated. Three accessions of *Salacia reticulata* were collected from Calicut, Trissur and Pondichery.	Survey of *Salacia* species in natural habitat. Efforts were made to optimize protocol for mass multiplication of *Salacia.*	Morphological characterization of accessions. Study on plant growth and maturity of root. Mass propagation through *in vitro (*CPMB)	Identification of elite genotype based on root yield and quality (salacinol and mangiferin).

Crop: Gymnema – *Gymnema sylvestre*						
Theme No. and Title		**Theme :1.Development of a variety with high yield and quality traits**				
Theme Leader		Dr. K.Rajamani, Professor and Head, Dept. of Medicinal and Aromatic Crops, HC &RI, Coimbatore				
Project No & Title		HCRI/CBE/HOR/MED/2016/002 Characterization and evaluation of *Gymnema sylvestre* R.Br				
S.No.	**Theme Activity**	**Name of the scientist(s) and centre**	**Year 2016-17**	**Year 2017– 18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
2.	Collection, characterization and evaluation of genotypes in gymnema (*Gymnema sylvestre)*	Dr. L. Nalina, Assistant Professor (Horticulture) Dept. of Medicinal and Aromatic Crops	Morphological characterization of the germplasm. Variations were observed for leaf shape, leaf base, leaf tip, leaf colour and leaf pubescence and yield characterization of the germplasm	Identification of high yielding accessions *Gs* 16 (Kuridimalai local 1) which recorded highest fresh and dry leaf weight (1.93kg/plant and 0.92 kg/plant) respectively. Gymnemagenin content of the accession is 0.90 %.	Molecular characterization of the germplasm. Multiplication of elite genotypes.	Identification of promising types for yield and quality traits

Crop : *Ocimum* - (*Ocimum sanctum*)					
Theme No. and Title		**Theme: 1.Development of a variety with high yield and quality traits**			
Theme Leader		Dr. K.Rajamani, Professor and Head, Dept. of Medicinal and Aromatic Crops, HC &RI, Coimbatore			
Project No & Title		Screening of germplasm to identify promising types in *Ocimum*			
S.No.	**Theme Activity**	**Name of the scientist(s) and centre**	**Year 2017– 18** **Progress made**	**Year 2018-19** **Work plan**	**Deliverables**
3.	Screening of germplasm to identify promising types in *Ocimum*	Dr. T. Thangaselvabai, Professor and Head Dr.N. Manikanda Boopathi, Assistant Professor (Biotech) HC&RI, Periyakulam	Nine *Ocimum sanctum* accessions were collected	Morphological characterization of germplasm Evaluation of accessions for yield and quality traits	Development of variety with high herbage yield and oil content in *Ocimum sanctum*

CROP MANAGEMENT

Crop : Davanam						
Theme No. and Title		**Theme: 1. Plant growth regulators for higher yield and quality**				
Theme Leader		Dr. K.Rajamani, Professor and Head, Dept. of Medicinal and Aromatic Crops, HC &RI, Coimbatore				
Project No & Title		**Studies on plant growth regulator consortia for higher yield of herbage and oil**				
S. No.	**Theme Activity**	**Name of the scientist(s) and centre**	**Year 2016-17**	**Year 2017– 18**	**Year 2018-19**	**Deliverables**
			Progress made		**Work plan**	
1.	Development of ideal plant growth regulator mixture to improve the productivity and quality of herbage and oil in Davana	Dr. K. Venkatesan, Professor (CRP) Dr. T.Thangaselvabai, Professor and Head	Preparation and standardization of plant growth regulators and nutrient mixture.	An experimental trial was conducted with combination of 9 treatments of PGR and nutrient mixture. Nutrient mixture along with 200 ppm GA3 and 50 ppm salicylic acid recorded the maximum herbage yield	Confirmation trial has to be conducted.	Development of plant growth regulator and nutrient mixture for Davanam.

Crop Protection in Horticulture Crops

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 31st May, 2018. The Professor and Heads of the Department of Agricultural Entomology, Plant Pathology and Nematology co-chaired.

List of URP/AICRP/ERP

Crop	Agrl. Ent. (No.)	Pl. Path. (No.)	Nematology (No.)
University Research Projects			
Fruits	2	4	2
Vegetables	3	6	10
Flowers	1	2	2
Spices & Plantation crops	1	2	-
Medicinal & Aromatic Crops	1	2	-
Total	**8**	**16**	**14**
AICRP Projects			
Fruits	-	1	1a
Vegetables	-	1	1b
Flowers	-	-	-
Spices & Plantation crops	-	1	-
Medicinal & Aromatic Crops	1	1	-
Total	**1**	**4**	**1**
Externally Funded Projects			
Fruits	-	1	-
Vegetables	2	2	-
Flowers	-	-	-
Spices & Plantation crops	-	-	-
Medicinal & Aromatic Crops	-	-	-
Total	**2**	**3**	-

A. Remarks on ongoing University Research Projects

S.NO	Project Details	Project wise remarks
I.	**Fruits**	
Entomology		
S.No.	**Project No., Title and PI**	**Remarks**

1.	**CPPS/CBE/ENT/FRU/2015/001** Development and validation of LC/MS/MS method for the simultaneous determination of neonicotinoid pesticides in fruits and vegetables **Period**: June 2015-May 2018 Dr. A. Suganthi, Asst. Professor (Entomology), Coimbatore	Since the project duration is over, completion report needs to be submitted on or before 30.07.2018. New URP presented in the Department needs to be sent for get number from the DR on or before 31st July 2019.
2.	**CPPS/MDU/PAT/FRU/2016/001** Studies on diversity, temporal trend and integrated management of mite species infesting acid lime **Period**: Sept.2016 to Aug.2019 Dr. C. Chinniah, Professor & Head, Dept of Entomology, AC&RI, Madurai	This project treatments need midterm correction. The best botanicals screened during the first two years may be test verified and the no. of botanicals may be reduced. The project work may be continued.
Plant Pathology		
3.	**CPPS/TDK/PAT/FRU/2016/001** Biological control of wilt disease of hill banana incited by *Fusarium oxysporum f.sp. cubense* **Period**: October 2016 to September 2019 Dr. I. Yesuraja, Professor (Pl. Path.) Thadiayankudisai	The native isolates of *Bacillus*, *Trichoderma* and *Pseudomonas* may be used in the experiment may be identified at species level before testing under field condition. The identified cultures need to be submitted at Dept. of Plant Pathology, TNAU, Coimbatore. The project work may be continued.
4.	**CPPS/BSR/PAT/FRU/2014/001** Management of Sigatoka leaf spot disease of banana through foliar spraying and pseudostem injection. **Period**: October 2014 – September 2017 Dr.S.Maruthasalam, Asst. Prof. (Plant Pathology), ARS, Bhavanisagar	As the project period is over, the completion report is to be submitted along with copies of publications on or before 31st Aug'2018.
5.	**CPPS/PAI/PAT/FRU/2016/001** Management of gummosis and die-back of mango through fungicides and cultural practices. **Period**: October 2016-September 2019 Dr.T.Anand, Asst. Prof. (Plant Pathology) RRS, Paiyur	In the treatment details, the words "pruning alone" may replaced with the removal of affected twigs. T8 should be common for all treatments. The project work may be continued.
6.	**CPPS/TRY/PAT/FRU/2014/006** Studies on integrated management of wilt disease in guava. **Period**: June 2014 – May 2018 Dr.A.Sangeetha , HC&RI (Women), Trichy	The project may be closed and completion report should be submitted on or before 31st July 2018. Copies of publications to be send to the Director (CPPS). A new URP may be proposed based on the theme area identified.
7.	**CPPS/APK/PAT/FRU/2013/001** Development of management strategies against damping off in custard apple, ber, manila tamarind, bael, aonla and wood apple. **Period**: August 2013 to July 2016 Dr. P. Mareeswari, Asst. Prof. (Pl. Path.)	A new sub project has to be proposed on basal rot/ purple blotch onion and other vegetable crops. Closer proposal report may be submitted on or before 31st Aug-2018.

Nematology		
8.	**HCRI/CBE/NEM/FRU/2014/003** Root knot nematode management in guava **Period:** Jan. 2015 - Dec. 2017 Dr. P. Vetrivelkalai, Asst. Prof. (Nem.)	Two season field experiments were conducted by using biocontrol agents along with FYM and pressmud. Since guava is along duration crop it is recommended to send extension proposal for one more year.
9.	**CPPS/CBE/NEM/FRU/2017/001** Assessment of nematode induced fungal wilt complex in pomegranate (*Punica granatum* L.) and formulating biomanagement strategy **Period:** Jan. 2018 - Dec. 2021 Dr. K. Poornima, Professor and Head (Nematology)	Survey was conducted in Thondamuthur, Coimbatore district for the occurrence of root knot nematode and Fusarium complex in pomegranate. The project may be continued.
II. Vegetables		
Entomology		
10.	**CPPS/CBE/ENT/VEG/2015/005** Fate of insecticides applied on chillies from farm to fork **Period**: April 2015 to March 2018 Dr. B. Vinothkumar, Assistant Professor (Agrl. Entomology), TNAU, Coimbatore	Since the project duration is over, completion report needs to be submitted on or before 30.07.2018. New URP may be proposed.
11.	**CPPS/TRY/ENT/VEG/2016/001** Screening of bhendi entries/varieties and evaluation botanicals / newer insecticidal molecules for management of bhendi fruit borer complex **Period**: June 2016 - December 2019 Dr. M.Chandrasekaran, Asst. Professor (Entomology), HC&RI (W), Trichy	The project work may be continued. However, include TNAU bhendi varieties for comparison and detailed study is needed on the mechanisms of resistance found in the selected entries against bhendi fruit borer. Bhendi accessions may also be screened for other fruit borer like *Helicoverpa armigera.*
12.	**CPPS/MDU/ENT/VEG/2017/001** Bio-ecology and management of tea mosquito bug, *Helopeltis* spp. (Heteroptera: Miridae) in moringa eco-system **Period**: June 2017- May 2020 Dr. K. Suresh, Asst Prof. (Agrl Ento.) AC& RI, Madurai	No progress was made on survey for the year 2017-18 which needs justification. The scientist of the scheme has not attended the pre-review meet. The actual progress of the work and future plan is to be intimated to the Director (CPPS).
Plant Pathology		
13.	**CPPS/CBE/PAT/VEG/2018/NEW** Development and validation of endospore based formulation of *Bacillus* sp. for the management of major soil borne diseases of tomato **Period**: July, 2017 to June, 2020 Dr.S.Harish, Asst. Prof.(Plant Pathology), AC&RI, Madurai	The location and habitat from where the isolates collected may be mentioned. The identified cultures available in the Dept. of Plant Pathology, TNAU, CBE may be utilized for bioefficacy testing. The project work may be continued. Project number may be obtained early.

14.	**CPPS/PAI/PAT/VEG/2015/003** Chemical and biological management of tomato early blight caused by *Alternaria solani* (Ellis and Martin) Jones and Grout **Period**: June 2015- May 2018 Dr. T. Anand, Asst. Prof. (Pl. Pathology), RRS, Paiyur	Completion report may be submitted on or before 31st July, 2018. The publications made from the project needs to be submitted to the Director (CPPS).
15.	**CPPS/MDU/PAT/VEG/2017/001** Documentation of Begomoviruses infecting brinjal and their management **Period**: June 2015- May 2018 Dr. K. Kalpana AC & RI, Madurai	Confirmation and characterization of virus complex associated with brinjal. The project work may be continued.
16.	**CPPS/CBE/PAT/VEG/2016/001** Combating pandal vegetable (Snake gourd) diseases by organic approaches. **Period**: June 2016- May 2019 Dr. S.K. Manoranjitham, Asst. Prof. (Plant Pathology), TNAU, Coimbatore	The phytotoxicity and mode of action of sodium bicarbonate should be studied. Comparison of the effect of salicylic acid on disease management may be included. The project work may be continued.
17.	**CPPS/CBE/PAT/VEG/2017/001** Evolving organic management strategies to combat fusarial wilt and peanut bud necrosis virus disease in tomato. **Period**: August 2017 to August 2020 Dr. S.K. Manoranjitham, Asst. Prof.(Plant Pathology), TNAU, Coimbatore	The *Bacillus subtilis* identified should be submitted to the Dept. of Plant Pathology culture collection deposit. The project may be continued to test the efficient *Bacillus subtilis* by making suitable delivery system. The project work may be continued.
18.	**CPPS/CBE/PAT/VEG/2017/001** Management of postharvest decay of carrot (*Daucus carota* L. var. *sativus*) through alternative strategies **Period**: July 2017 to June2020 Dr.S.Vanitha, Prof.(Plant Pathology), TNAU, Coimbatore	While fixing the treatments edible oils may be given priority. Highly aromatic oils are to be avoided since, carrot is consumed fresh. The project work may be continued.
Nematology		
19.	**CPPS/MDU/NEM/VEG/2015/001** Management of root knot nematode, *Meloidogyne incognita* on tomato using bioinoculants. **Period:** April 2015 - March 2018 Dr. K. Devrajan, Professor (Nematology)	The completion report may be submitted on or before 31st July 2018. The identity of *Trichoderma* sp. should be verified and accession number to be obtained. The identified cultures need to be submitted at Dept. of Plant Pathology, TNAU, Coimbatore. The completion report may be submitted.

20.	**CPPS/CBE/NEM/VEG/2017/001** Biocontrol potential of egg parasitic fungus, *Purpureocillium lilacinum* against root knot nematode, *Meloidogyne incognita* on tomato. **Period:** Sep 2017 to Aug 2020 Dr. A. Shanthi, Professor (Nematology)	Survey was conducted and three egg parasitic fungi have been isolated. The identity of the fungi should be revealed and accession number to be obtained. The project may be continued.
21.	**CPPS/CBE/NEM/VEG/2016/002** Biochemical basis of root knot nematode resistance in tomato and tuberose. **Period:** October 2016- September 2018 Dr.P. Kalaiarasan, Asst. Prof. (Nem.)	A total no. of 101 tomato and 18 tuberose germplasm/ varieties have been screened. None of the them showed resistance. The project may be closed on or before 31st Oct 2018. The scientist is requested to propose new URP as theme based area identified.
22.	**CPPS/PAI/NEM/VEG/2015/001** Integrated approach for the management of root knot nematode, *Meloidogyne incognita* in tomato under precision farming system. **Period:** June 2015- May 2018 Dr.P.Senthilkumar, Asst. Prof. (Nem.), RRS, Paiyur	The completion report may be submitted on or before 31st July 18. New project (URP) may be proposed based on the theme area identified.
23.	**CPPS/PAI/NEM/VEG/2015/002** Assessment and management of root knot nematode (*Meloidogyne incognita)* and bacterial wilt (*Ralstonia solanacearum*) complex in brinjal at North Western zone of Tamil Nadu. **Period:** June 2015- May 2018 Dr.P.Senthilkumar, Asst. Prof. (Nem.), RRS, Paiyur	Pictures related to histopathological studies should be included in the report. The completion report may be submitted on or before 31st July 18.New project (URP) may be proposed based on the theme area identified.
24.	**CPPS/PKM/NEM/VEG/2016/001** Management of brinjal pests using native entomopathogenic nematode and its symbiotic bacteria. **Period:** May 2016- Feb. 2019 Dr. S. Prabhu, Asst. Prof. (Nematology) HC &RI, Periyakulam	Identification of entomopathogenic nematode and its symbiotic bacteria may be carried out by morphological and molecular characterization. Mode of action of bacteria may be studied.The project work may be continued
25.	**CPPS/CBE/NEM/VEG/2016-001** Enhancement of performance of nematode antagonistic bioagents, *Pochonia chlamydosporia* and *Pasteuria penetrans* for the management of sedentary endoparasitic nematodes of polyhouse cucumber **Period:** Oct, 2016 - Sept. 2019 Dr. N.Swarnakumari, Asst. Prof. (Nem.)	In oil based formulation, removal / dissolving of oil coat at the time of delivery may be explored. The formulation may be tested under field condition. The project may be continued.

26.	**CPPS/KOD/NEM/VEG/2014/001** Management of potato cyst nematodes (PCN) through liquid bio-formulations **Period:** August 2014 - July 2017 Dr.N.Seenivasan, Asst. Professor (Nem.) ADAC &RI, Trichy	The findings may be given as 'for information'. A new project (URP) may be proposed on screening of bhendi entries for nematode resistance used by Dr. M.Chandrasekaran in the project No. CPPS/HCRI/ TRY/ENT/ VEG/2016/001.
27.	**CPPS/KOD/NEM/VEG/2014/002** Management of root knot nematode using liquid bio-formulation in carrot. **Period:** August 2014 - July 2017 Dr.N.Seenivasan, Asst. Professor (Nem.) ADAC &RI, Trichy	The findings are to be given for information. The project may be closed and the closure proposal is to be submitted on or before 31st July,2018.
III. Spices and Plantation		
Entomology		
28.	**CPPS/ ALR /ENT/SPC/2015/002** Reaction of location specific new coconut hybrids (D x T, T x D & T x T), Exotic, local Tall ecotypes and dwarf cultivars against coconut pests for exploitation of resistance **Period**: July 2015 – June 2018 Dr K. Rajamanickam, Professor (Agrl. Ento.), CRS, Aliyarnagar	The findings are to be given for information. Since the project duration is over, completion report needs to be submitted on or before 31st August 2018. New URP may be proposed .
29.	**CPPS/ ALR/ ENT/ SPC/ 2017 / 001** Studies on the population dynamics and management of Rugose spiralling whitefly, *Aleurodicus rugioperculatus* Martin in coconut **Period**: July 2016-June 2019 Dr. M. Alagar, Asst. Prof.(Entomology), CRS, Aliyarnagar	Based on the damage ratings of RSW, invasion of the pest in other coconut intensive districts is to be monitored. The project may be continued.
Plant Pathology		
30.	**CPPS/CBE/PAT/SPC/2015/001** Development of management practices for ginger rhizome rot by bio control agents and fungicides **Period**: June 2015 to May 2018 Dr. C. Ushamalini, Asst. Prof. (Pl. Path), HC&RI, TNAU, Coimbatore	The pooled mean of two trials indicated that rhizome treatment (10g/kg of rhizome) combined with soil application of *P.fluorescens* @ 2.5kg/ha has reduced the incidence of rhizome rot in ginger. Hence this treatment is recommended for OFT. Completion report should be submitted on or before 31st July 2018.
31.	**CPPS/ALR/PAT/SPC/2014/001**. Evaluation of fungicides and different methods of application for the management of leaf blight disease of coconut **Period:** July 2014 to June 2017 Dr. R.Ramjegathesh, Asst. Prof. (Pl.Path.), CRS, Aliyar	Among the different fungicides evaluated, root feeding of tebuconazole @ 2 ml+100 ml of water for 3 times at 3 month interval was found to be effective in reducing the leaf blight disease intensity. Closure proposal may be submitted on or before 31st July 2018.

32.	**CPPS/ALR/PAT/SPC/2016/001.** Documentation of hot spot areas and optimization of management strategies for coconut root (wilt) disease in Tamil Nadu, CRS, Aliyar **Period:** January 2016 – January 2019 Dr.R.Ramjegathesh, Asst. Prof. (Pl. Path.), CRS, Aliyar	Survey was conducted in hot spot areas. The results indicated that maximum incidence of root (wilt) disease occurred in Theni district (10.28%) and Tirunelveli district (10.20%). No incidence was reported in Dindigul district. Since the PI is transfer and Dr. E.Rajeshwari, Asst. Prof. (Plant Pathology) is requested to continue the survey in other districts.
IV	**Medicinal and Aromatic Crops**	
33.	**CPMB/CBE/BIC/FRU/2015/001** Isolation and characterization of insecticidal principles from the leaf and seed of *Annona muricata* **Period**: 2015-2018 Dr. D Uma, P&H (Biochemistry), TNAU, Coimbatore	Insecticidal principles from the leaf and seed of *Annona muricata* is formulated. Completion report is to be submitted on or before 30.07.2018. Based on the results, efforts may be continued for technology release/ commercialization.
34.	**CPPS/CBE/PAT/MED/2018/001** *Bacillus* spp. mediated management of root rot diseases of *Gloriosa superba* **Period:** January 2018 to Dec.2020 Dr.G.Thiribhuvanamala, Asst. Prof. (Pl. Path.), HC&RI, TNAU, Coimbatore	*Bacillus* spp. available in the Dept. of Plant Pathology may be used in the trials to test their bioefficacy. The Project work may be continued
35.	**CPPS/CBE/PAT/MED/2016/001** Assessment of mycoflora and their toxins in medicinal plants and spice Products Dr.V.Paranidharan, Prof.(Pl. Path.), HC&RI, TNAU, Coimbatore **Period:** March 2016 to January 2019	Periodical checking of mycotoxins and microflora at different periods to be done for all the treatments. The project may be continued. The findings may be given for information.
V. Flower crops		
Entomology		
36.	**CPPS/CBE/ENT/FLO/2016/001** Leaf miner diversity on cut flowers under protected cultivation of Tamil Nadu **Period**: June 2015-May 2018 Dr.T.Elaiyabharathi, Asst. Prof. (Ento.)	Three leaf miner species *viz*., *Liriomyza trifoli, Chromatomya hortichola and Chromatomya nigra* have been found associated with the protected cultivation. Among them *C.hortichola* was found to occur most frequently in Dharmapuri, Krishnagiri and The Nilgiris districts causing damage upto 80 per cent. Completion report needs to be submitted on or before 31st July 2018. New URP may be proposed.
Pathology		
37.	**CPPS/CBE/PAT/FLO/2015/001**: Development of water soluble formulation of *Bacillus* spp. for the management of foliar diseases of anthurium under protected cultivation **Period:** Dr.S.Nakeeran, Prof. (Pl. Pathology), TNAU, Coimbatore	Bioefficay of water soluble formulation of *Bacillus* spp. for the management of foliar diseases of anthurium under protected cultivation has been completed. The results showed that 50 per cent inhibition. Completion report may be submitted on or before 31st July 2018. The best treatments may be given for OFT. The scientist may be proposed new URP.

38.	**CPPS/TRY/PAT/FLO/2015/001** Studies on the management of major diseases of tuberose and Ixora **Period:** Dr. K.Karunanithi, Professor (Pl. Patho.), HC&RI,(W), Trichy	The findings of project have not been presented. If, the objectives are achieved. The closer proposal may be sent on or before 31st July 2018.
Nematology		
39.	**ACRI/TRY/NEM/FLO/2014/001** Eco-friendly approaches for the management of root knot nematode in tuberose. **Period:** June 2014 -May 2017 Dr.T.Senthilkumar, Asst. Prof. (Nem.) ADAC &RI, Trichy	Cfu of *P.lilacinum* in the formulations may be indicated. The best treatment along with standard check may be proposed for OFT. The completion report may be submitted on or before 31st July 2018.
40.	**CPPS/PAI/NEM/FLO/2015/001** Physiological and bio chemical modification through bio inducer in tube rose infected with root knot nematode, *Meloidogyne incognita* **Period:** June 2015- May 2018 Dr.P.Senthilkumar, Asst. Prof. (Nem.) RRS, Paiyur	As the results of the URP is not noteworthy. Closer proposal may be submitted on or before 31July 2018.

For Adoption

1. **Management of root knot nematode, *Meloidogyne incognita* infesting tomato under polyhouse conditions**

   Application of *Purpureocillium lilacinum* as seed treatment @ 10g/kg of seed followed by soil application @ 50g/m^2 reduced the root knot nematode population in soil by 41.7% and root knot index by 40.0 % and increased the tomato yield by 38.7% compared to untreated control.

For On-Farm Trial

OFT 1. Chemical management of tomato early blight caused by *Alternaria solani*

Treatments proposed:

T1: Propiconazole (0.1%) at 30 and 50 days after planting (DAP)

T2: Hexaconazole (0.1%) at 30 and 50 days after planting (DAP)

T3: Mancozeb (0.2%) at 30 and 50 days after planting (DAP) – chemical check

T4: Untreated control

Design: RBD; Replications: 5

Variety: Popular Hybrid/variety

Plot size: 20m^2

First spray at initial appearance of the disease and second spray at 15 days after first spray

Observations to be recorded:

Early blight incidence (PDI)

Fruit yield (kg/ha)

CB ratio

Centres:

1. Dr. M. Karthikeyan, HC&RI, Coimbatore,
2. Dr. Dr. A. Vijayasamundeeswari, HC&RI, Periyakulam and
3. Dr. A. Sangeetha, HC&RI (W), Trichy

OFT 2. Development of management practices for ginger rhizome rot by bio control agents and fungicides

Treatments proposed

T1: RD @ 0.25% +SA of *P. fluorescens* (talc formulation) @ 2.5kg/ha + FYM on 3, 5 and 7 MAP

T2: RD @ 0.1% + SD with Metalaxyl on 3, 5, 7 MAP

T3: RD @ 0.25% + SD with in copper oxy chloride on 3, 5, 7 MAP

T4: Untreated control

Design: RBD Replications : 5

Variety: Rio-de-Janeiro

Observations to be recorded:

a. Germination (%)

b. Plant height (cm)

c. Rhizome rot incidence (%)

d. Rhizome yield and Cost-Benefit ratio

Centers

1. Dr. Sangeetha Panicker, ARS, Bhavanisagar
2. Dr. S. Malathi, HRS, Ooty,
3. Dr. A. Vijayasamundeeswari, HC&RI, Periyakulam

OFT 3. Management of root knot nematode, *Meloidogyne incognita* in tuberose

Treatment details:

T1- *Pochonia chlamydosporia* (bulb treatment @1 kg/ha + soil @ 2.5 kg/ha mixed with 100kg FYM)

T2 - *Pseudomonas fluorescens* (bulb treatment @1 kg/ha + soil @ 2.5 kg/ha mixed with 100kg FYM)

T3 - Phorate 10G @ 1 kg a.i./ha

T4- Untreated control

Design: RBD

Variety: Prajwal

Replications : 5

Observation to be recorded

- Initial and final nematode population soil (200cc), root (5g) & root knot index
- Stalk length (cm) and flower yield (g/plant); Benefit cost ratio

Centers

Dr. P. Vetrivelkalai, TNAU, Coimbatore
Dr. S. Prabhu HC&RI, Periyakulam
Dr. P. Senthilkumar, RRS, Paiyur

For information

- Two foliar sprays at 15 day intervals with propiconazole 20% EC (1.0 ml/l) or tebuconazole 50% + trifloxystrobin 25% WG (1.0 g/l) or hexaconazole 4% + zineb 68% (2.5 g/l) showed significant (>50%) effect on sigatoka leaf spot disease incidence in banana.

Emerging diseases / nematodes

- Emerging virus disease of *Gloriosa superba* - Virus confirmed as Potyvirus – Gloriosa stripe mosaic virus
- Occurrence of *Tobacco streak virus* infecting Anthurium (*Anthurium andreanum* Linden ex Andre)
- New record of root knot nematode, *Meloidogyne arenaria* & *M.incognita* in mango var. Banganapalli, Himampasand – Kalaiyar Kovil village, Sivaganga district.
- New record of root knot nematode, *Meloidogyne indica* in citrus var. Balaji – Coimbatore and Erode districts.

General Recommendations

1. Theme based action plan project should be formulated as URP.
2. In case, if the work has been started already without getting a URP number the scientist are advised to regularize the activity under URP in order justify their work load.
3. 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.
4. Wherever new pest or disease or nematode is recorded, the same should be informed to the concerned technical Heads in main campus and Director (CPPS) TNAU, Coimbatore through a special report, so as to monitor alien pests for effective forewarning.

B. Action plan (2018 -2019)

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

Action Plan 1: Screening of germplasm and mechanism of resistance

Theme Leaders	Dr. M. Chandrasekaran, Asst. Professor (Entomology), HC&RI (Women), Trichy Dr. P. Kalaiarasan, Asst. Professor (Nematology), TNAU, Coimbatore	
Sub-theme	**Activities (2018-19)**	**Deliverables**
Screening of bhendi entries/varieties against bhendi fruit borer CPPS/TRY/ENT/VEG/2016/001 **Dr. M.Chandrasekaran** HC&RI (W), Trichy	• Out of 55, twenty five resistance sources have been selected. These entries are to be screened under artificial screening. Mechanism of resistance – physical, biochemical needs to be studied. Effect of volatiles on pest and natural enemies is to be recorded. • **Observations to be recorded :** Per cent fruit damage, pest rating, Plant height, fruit length and fruit girth and yield parameters. `	Sources of resistance from germ plasm lines
Screening of germplasms of tomato, brinjal and tuberose and identification of mechanism of resistance against root knot nematode, *Meloidogyne incognita.* CPPS/CBE/NEM/VEG/2016/002 **Dr. P. Kalaiarasan** (tomato, tuberose) **Dr. K. Senthamizh**, (brinjal)	• Screening of tomato, brinjal and tuberose against root knot nematode, *M. incognita* will be continued. • Enzyme (Phenol, Polyphenol, PPO, PAL) based studies for identification of root knot nematode resistance in tomato, brinjal and tuberose • **Observations to be recorded** Gall Index, Nematode population in soil (200cc) and root (5g). Activity of the PO, PPO, PAL Enzyme phenotypes	

Action Plan 2: Pesticide dynamics in horticultural crops

Theme 3	**Pesticide dynamics in horticultural crops**	
Theme Leader	Dr. K. Bhuvaneswari, Professor (Entomology), Dept. of Entomology, TNAU, Coimbatore	
Monitoring of Pesticide residues (New)	• Collection of fruits, vegetables, spices, tea, fish, rice, pulses and water samples from Kotagiri, Tirupur, Kanyakumari, Namakkal, Erode, Pollachi	Data on pesticide residue status

Action Plan 3: Pest, diseases and nematodes management in open/ protected cultivation

Theme 1	**Pest, diseases and nematodes management in Mango/Banana/ Acid Lime/ Guava/ Pomegranate**	
Theme Leaders	Dr. T. Anand, Assistant Professor (Plant Pathology) Regional Research Station, Paiyur Dr. K.Poornima, Professor & Head, Dept. of Nematology, TNAU, Coimbatore	
Sub-theme	**Activity (2018-19)**	**Deliverables**
Management of gummosis and die-back of mango through fungicides and cultural practices CPPS/PAI/PAT/FRU/2016/001 **Dr. T. Anand,** RRS, Paiyur	• Cultural practices (removal of infected twigs/branches) and the effective fungicide *viz*., tebuconazole (0.1%), thiophanate methyl (0.1%), propiconazole (0.1%) will be tested under field conditions • **Observations to be recorded** Incidence of gummosis/die-back (Monthly interval) Fruit yield (kg/tree) CB Ratio	Effective method of management of gummosis and die-back of mango.

Biological control of wilt disease in Hill Banana CPPS/TDK/PAT/FRU/2016/001 **Dr. I. Yesuraja** HRS, Thadiayankudisai	• Effective biocontrol agents Viz., *Bacillus subtilis* Poolathur isolate*, P. fluorescens* Perumparai isolate and *Trichoderma sp.* Pandrimalai isolate will be tested under field conditions. • **Observations to be recorded** Per cent disease infection (hill banana) Rhizosphere populations of biocontrol agents	The effective native biocontrol isolate will be identified for the management of Fusarial wilt in Hill Banana
Studies on diversity, temporal trend and integrated management of mite species infesting acid lime CPPS/MDU/PAT/FRU/2016/001 **Dr. C. Chinniah** AC&RI, Madurai	• Evaluation of newer acaricides viz., propargite and fenazaquin for their bio efficacy against mite species of acid lime • **Observations to be recorded:** Mean mite population, Yield and C: B ratio.	Developing a suitable and feasible IPM package by integrating various bio-rational management strategies to suppress mite species complex infesting acid lime
Assessment of nematode induced fungal wilt complex in pomegranate (*Punica granatum* L.) and formulating biomanagement strategy CPPS/CBE/NEM/FRU/2017/001 **Dr. K. Poornima**, TNAU, CBE	• Isolation of other associated microorganisms (fungi/ bacteria) and proving their pathogenicity *vis-à-vis* root-knot nematodes in causing disease complex in pomegranate. • **Observations to be recorded:** Nematode population in soil (200cc) and root (5g), gall index	Development of biointensive against root knot nematode and fungal complex
Root knot nematode management in guava HCRI/CBE/NEM/FRU/2014/003 **Dr. P. Vetrivelkalai** TNAU, CBE	• Field experiment will be conducted by using biocontrol agents along with FYM and pressmud • **Observations to be recorded:** Nematode population in soil (200cc) and root (5g), Yield	Development of ecofriendly management against root knot nematode in guava
Theme 2	**Pest, diseases and nematodes management in Tomato/ Brinjal / Cucumber / Carrot/ Onion / Bitter gourd**	
Theme Leaders	Dr. S. Harish Assistant Professor (Plant Pathology), AC& RI, Madurai Dr. A. Shanthi, Prof. (Nematology), TNAU, Coimbatore	

Development and validation of endospore based formulation of *Bacillus* sp. for the management of major soil borne diseases of tomato CPPS/CBE/PAT/VEG/2018/NEW **Dr.S.Harish**, AC&RI, Madurai	• Standardisation of endospore formulation and dosage optimisation of the effective *Bacillus* isolate BT8. **Observation to be recorded** • Efficacy and storability of formulations	Development of endospore-based formulation of *Bacillus* 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 CPPS/CBE/PAT/VEG/2017/001 **Dr. S.K. Manoranjitham** TNAU, Coimbatore	• Two beneficial biocontrol *Bacillus subtilis* (PBC2 and PBC12) will evaluated under open filed condition for fusarial wilt and peanut bud necrosis virus disease in tomato • **Observation to be recorded** • Disease incidence (%), Fruit yield (t/ha) and C:B ratio	Effective organic method of management for Fusarial wilt and peanut bud necrosis virus disease.
Nematode management in drip irrigated crop (tomato) CPPS/CBE/NEM/VEG/2017/001 **Dr.A. Shanthi** TNAU, Coimbatore	• Bio-management of root knot nematode, *M. incognita* using *Purpureocillium lilacinum, Pochonia chlamydosporia* and *T. asperellum* along with FYM • **Observations to be recorded** • Gall Index, Nematode population in soil (200cc) and root (5g). Yield (t/ha)	Management methods against root knot nematode*, M. incognita* infesting pomegranate grown in drip irrigation.
Documentation of Begomoviruses infecting brinjal and their management CPPS/MDU/PAT/VEG/2017/001 **Dr.K.Kalpana** AC & RI, Madurai	• Confirmation and characterization of virus complex associated with brinjal. • **Observations to be recoded** • Virus incidences • Documentations of different symptoms associated with brinjal	Development of IPM module for the management of begomoviruses / Identification of suitable EPNs for the management of insect pests (Ash weevil, shoot and fruit borer Leaf hopper, Epilachna beetle and mealy bug) in Brinjal
Integrated Approach/ EPNs species for pest management in brinjal CPPS/PKM/NEM/VEG/2016/001 **Dr. S. Prabhu**, HC &RI, Periyakulam	• Mass multiplication and formulation of cell free extract of symbiotic bacteria, *Steinernema* and field evaluation against Ash weevil, shoot and fruit borer Leaf hopper, Epilachna beetle and mealy bug • **Observations to be recorded** • Insect mortality, Shelf life of bacterial formulations, Pest incidence, Yield (t/ha)	

Nematode management in pandal vegetable crops (Bitter gourd) New **Dr. K. Senthamizh** VRS, Palur	• Bio-management of root knot nematode, *M. incognita* using *Purpureocillium lilacinum, Pochonia chlamydosporia* and *T. asperellum* along with FYM • **Observations to be recorded** • Gall Index, Nematode population in soil (200cc) and root (5g) and Yield (t/ha)	Management methods against root knot nematode*, M. incognita* infesting tomato, in drip irrigation.
Management of postharvest decay of carrot (*Daucus carota* L. var. *sativus*) through alternative strategies CPPS/CBE/PAT/VEG/2017/001 **Dr.S.Vanitha**, TNAU, Coimbatore	• Thymeoil, lemongrass oil and cinnamon oil 40 EC formulations will be test verified for the management of postharvest decay of carrot. • **Observations to be recorded** • Disease severity (%) • Loss assessment	Development of essential oil liquid formulations for the management of post-harvest decay of carrot.
Nematode management in drip irrigated crops (Cucumber) CPPS/CBE/NEM/VEG/2016-001 **Dr. N.Swarnakumari** TNAU, Coimbatore	• Bio-management of root knot nematode, *M. incognita* using *Purpureocillium lilacinum, Pochonia chlamydosporia* and *T. asperellum* along with FYM ▪ **Observations to be recorded** Gall Index, Nematode population in soil (200cc) and root (5g). Yield (t/ha)	Management methods against root knot nematode*, M. incognita* infesting, bittergourd and cucumber grown in drip irrigation.
Theme 3	**Pest, diseases and nematodes management in Turmeric/ Coconut**	
Theme Leaders	Dr. S. Thangeswari, Asst. Prof. (Plant Pathology), CRS, Veppankulam Dr.C.Ushamalini, Assistant Professor (Plant Pathology), TNAU, Coimbatore	

Evaluation of fungicides for the management of BSR of coconut in coconut (New) **Dr. S. Thangeswari** CRS, Veppankulam	• Root feeding of tebuconazole, tetraconazole, propiconazole and hexaconazole 2ml + 100ml of water at 3 months interval will be carried out for BSR management. **Observation to be recorded** • Disease index (monthly interval) and Yield (Nut/palm/year)	Forewarning and conceptualising for management strategies for BSR of coconut
Foliar disease management in Turmeric CPPS/CBE/PAT/SPC/2015/001 **Dr.C.Ushamalini** TNAU, Coimbatore	• Foliar spray with effective fungicides *viz*., carbendazim (0.1%), hexaconazole (0.1%) and tebuconazole (0.1%) will be tested under field condition **Observation to be recorded** • PDI for foliar disease • Yield (t/ha)	Management strategy for foliar diseases in turmeric will be developed.
Theme 4	**Pest, diseases and nematodes management in medicinal crops**	
Theme Leaders	Dr.G.Thiribhuvanamala Asst. Prof. (Pl. Path.), TNAU, Coimbatore Dr.V.Paranidharan, Professor (Plant Pathology), TNAU, Coimbatore	
Bacillus spp mediated management of root rot diseases of *Gloriosa superba* CPPS/CBE/PAT/MED/2018/001 **Dr. G. Thiribhuvanamala** TNAU, Coimbatore	• Loss assessment due to root rot diseases in Ist year, 2nd year, 3rd year and 4th year and 5th year ratoon crop • *Bacillus* spp will be tested against root rot pathogens under *in vitro* conditions and pot culture conditions **Observations to be recorded** • Disease incidence (%), • Loss assessment (kg/ha)	Potential *Bacillus* sp. will be identified for management of root rot diseases of *Gloriosa superba*
Assessment of mycoflora and their toxins in medicinal plants and spice Products CPPS/CBE/PAT/MED/2016/001 **Dr.V.Paranidharan** TNAU, Coimbatore	• Impact of Aspergillus contamination will be assessed in Adathoda, Majoram and cinnamon samples and quantification of Aflatoxin B1 will be carried out by HPLC.	Impact of mycotoxin contamination in the medicinal plant products and spice products will be assessed.

Theme 5	**Pest, diseases and nematodes management in Flower Crops**	
Theme Leaders	Dr. M.Theradimani, Prof.(Pathology), HC&RI, Periyakulam	
Studies on the management of major diseases of tuberose and Ixora CPPS/TRY/PAT/FLO/2015/001 **Dr.N.Karunanithi**	Field trial for Sclerortial wilt disease will be conducted for tuberose **Observations to be recorded** • Root rot incidence (%) • Flower yield	Integrated management strategies will be developed for major diseases of tuberose
Ecofriendly management of Chrysanthemum wilt (New) **Dr. M.Theradimani** HC&RI, Periyakulam	*Invitro* studies of biocontrol agents and selective plant products against *Fusarium* wilt **Observations to be recorded** • Inhibition of pathogen growth	Potential biocontrol agents and selective plant product will be identified against the wilt pathogen

Action Plan 4: Invasive insect pests / diseases / nematodes monitoring

Theme 1	**Invasive insect pests in Coconut**	
Theme Leaders	Dr. M. Alagar Assistant Professor (Entomology), Coconut Research Station, Aliyarnagar	
Studies on the population dynamics and management of Rugose spiralling whitefly, *Aleurodicus rugioperculatus* CPPS/ALR/ENT/SPC/2017/001 **Dr. M. Alagar** CRS, Aliyarnagar	Population dynamics and management of Rugose spiralling whitefly **Observations to be recorded** • Yield loss assessment • Studies on seasonal incidence of the pest • Observations to be recorded: • Correlation of weather parameters with RSW incidence	Forewarning and conceptualising for management strategies for Rugose spiralling whitefly

Work load of each scientist – Plant Protection (Theme wise)

Theme 1: Screening of germplasm and mechanism of resistance

Theme 2: Pesticide dynamics in horticultural crops

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

Theme 4: Invasive insect pests / diseases / nematodes monitoring

S. No.	Name of the scientist	Percentage of time				
		Research	Teaching	Extension	Students guidance	Other activities
1.	Dr. M. Chandrasekaran	50	30	10	5	5
2.	Dr. K. Senthamizh	60	-	30	-	10
3.	Dr. K. Bhuvaneswari	50	30	10	10	-
4.	Dr. C. Chinniah	50	20	10	10	10
5.	Dr. I.Yesuraja	60	-	30	-	10
6.	Dr. T. Anand	60	-	30	-	10
7.	Dr.K. Kalpana	50	30	10	5	5
8.	Dr. S. Harish	50	30	10	5	5
9.	Dr. S.K.Manoranjitham	50	30	10	5	5
10.	Dr.C.Marreswari	60	-	30	-	10
11.	Dr. P. Kalaiarasan	50	30	10	5	5
12.	Dr. K.Poornima	50	20	10	10	10
13.	Dr. P.Vetrivelkalai	50	30	10	5	5
14.	Dr. A.Shanthi	50	30	5	10	5
15.	Dr. S.Prabhu	50	30	10	5	5
16.	Dr.S.Vanitha	50	30	5	10	5
17.	Dr.G.Jothi	50	30	10	5	5
18.	Dr.N. Swarnakumari	50	30	10	5	5
19.	Dr. S. Thangeswari	50	30	10	5	5
20.	Dr. C. Ushamalini	50	30	10	5	5
21.	Dr. G. Thiribhuvanamala	50	30	10	5	5
22.	Dr.V. Paranidharan	50	30	5	10	5
23.	Dr. N. Karunanithi	50	30	10	5	5
24.	Dr. M. Theradimani	50	30	10	5	5
25.	Dr. M. Alagar	60	-	30	-	10

General remarks:

- Root pruning studies of Mango can be taken with the expertise available with TNAU colleges. The works done at Kerala Horticulture University may be refered.
- Mango type with many small fruits per bunch (like litchi fruit bunch) may be developed for pickling purpose.
- Mango seedlings of two meter height may be used for planting and further pruning may be done to encourage future wood value.
- Alfanso fruit can be analyzed for the different esters imparting specific falvour to the fruit.
- MLT & ART studies for the tetraploid based banana culture on the pipeline for release may be expedited.
- Studies on the confirmation of fusarium race 4 on banana may be completed.
- Cashew planting materials used in the Palladam area for mass planting may be checked for its quality.
- Isozyme study to confirm the sex of the papaya plants may be taken up.
- In sapota uniformity of the fruit has to be maintained to improve the uniform ripening process. Impact of different training methods on ripening process may be studied.
- Mango variety developed by Paiyur farmer may be studied for quality parameters and specific aroma imparting volatiles.
- Carotein rich jack fruit collections may be evaluated and studied for its quality parameters.
- Available good types of pumkin and bottle gourds may be popularized at Sandhiyur and near by villages
- Brinjal types specific to Tamil Nadu a may be documented.
- Turmeric collections of North Eastern regions may be studied for its curcumin content and its possible commercial values.
- Kasthurimanzal having facepack value may be studied for its value and maintained.
- Curryleaf collections may be studied for specific characters (acids/volatiles).
- Multicut corriander types grown in Thondamuthur area and also the Thaiwan types may be collected and studied. Also the local type used in Palladam area as multicut corriander may be collected and studied.
- Horticulturist along with soil scientists and microbiologist may study the causes for the non performance of followup crop next to *Gloriosa* grown field and find alternatives to quinch the residues if any produced by *Gloriosa*.
- Possibilities of *Trichogramma* or other bioagents for managing banana nematode may be explored.
- In papaya, induced resistance for viral disease through spraying fungal spores may be studied.
- Flower inducement in mango, through different nitrate levels and panchakavia may be tried

- In guava high density/canopy management, relationship between biomass production and soil nutrition (input management versus yield component) may be studied. Also the usefulness of allowing branching after one meter from ground level as done in other states may be verified.
- Use of cruciferious crops to quinch the 'S' from soil as a bioremediation in problem soils may be explored.
- Garlic culture from HRS, Ooty which is under ART may be studied for its quality parameters.
- Butter pear type from Ooty may be multiplied at HRS, Kodaikanal also, for its supply to farmers.
- For the conduct of ART/MLT for advance cultures of Horticulture crops, University approval has to be obtained by specifying the locations, as done in Agricultural crops
- In Cassava, tuber uniformity may be maintained for easy mechanical harvesting
- Possibility of utilizing cassava planting to remove nicotine toxicity in the soil and water of tobacco grown areas (Vetharanyam surroundings) may be studied.
- Purpose for which turmeric is grown in different parts of Tamil Nadu may be studied through a survey. Also a turmeric type for roof top gardening may be identified.
- Suitable *Hibuscus* type with high pigment content to blend with tea may be tried.
- Bougainvillea types for ground cover may be studied.
- Impact of temperature on pollen sterility and seed setting problems of vegetables may be addressed.
- In *Strobilanthes* (Kurinji flower), flowering pattern and factors influencing may be studied.
- Residue levels of commonly used plant protection chemicals, both in the farm gate samples and market samples may be studied to understand the manipulations done at market level, before reaching consumer.
- Host induced resistance studies may be encouraged to reduce the chemical usage for pest and disease management.
- A status report on the important fruits of Tamil Nadu *viz*., Mango, banana and Jack may be prepared.

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