

TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

**39th Horticultural Crops Scientists Meet
(13th June, 2023)**

**Directorate of Research
Tamil Nadu Agricultural University
Coimbatore - 641 003**

2023

PROCEEDINGS
39th Horticultural Crops Scientists Meet
(13th June, 2023)

The 39th Horticultural Crops Scientists Meet was held on 13.06.2023 under the Chairmanship of Respected Vice Chancellor, **Dr. V. Geethalakshmi**, through hybrid mode. Individual review of research projects, Action taken on OFT, Action plan was made by the concerned Deans/Technical Directors in the concurrent sessions arranged on 12.05.2023.

The Vice chancellor highlighted the importance of developing demand oriented varieties / technologies, harnessing the potential of high density planting in horticultural crops, developing strategies to avoid price hike in vegetables (Onion and Tomato), organic cultivation of vegetables, tea and coffee, introduction of non-traditional crops like saffron, improving fragrance in flower crops through biotechnological tools and post harvest management and value addition through multidisciplinary approach.

In his introductory remarks, **Dr. M. Raveendran**, Director of Research emphasized the need for strengthening seed production and popularization of varieties and technologies. It was insisted to use molecular tools for varietal development in horticultural crops. It was suggested to popularize the grafting technique of Tomato and Moringa through demonstrations, development of papaya varieties resistant to PRSV and mango varieties suited for off-season, value addition in mango and guava. Research on spices and medicinal plants may be intensified to fulfil the requirements of industries.

In the concluding session, **Dr. P. Paramaguru**, Dean, HC&RI (W), Trichy presented the action taken report of the recommendations made during the 38th Crop Scientist's Meet. **Dr. P. Irene Vethamoni**, Dean (Horticulture), HC&RI, Coimbatore presented the Research Highlights of the year 2022-2023. **Dr. J. Rajangam**, Dean, HC&RI, Periyakulam presented the action plan formulated for 2023 – 24. The action taken on Plant Protection recommendations of the previous meet, progress made during 2022 – 23 and Action plan for 2023 – 24 was presented by **Dr. M. Shanthi**, Director (CPPS), TNAU, Coimbatore. The proceedings of the meet are given in the following sub-heads

I. Fruit Crops

- A. Cultures under MLT/ART/OFT
- B. Action plan: 2023 – 2024
- C. Remarks on the Research Projects

II. Vegetable Crops

- A. Cultures under MLT/ART/OFT
- B. Action plan: 2023 – 2024
- C. Remarks on the Research Projects

III. Spices and Plantation Crops

- A. Cultures under MLT/ART/OFT
- B. Action plan: 2023 - 2024
- C. Remarks on the Research Projects

IV. Floriculture and Landscape Architecture

- A. Cultures under MLT/ART/OFT
- B. Action plan: 2023 - 2024
- C. Remarks on the Research Projects

V. Medicinal and Aromatic Crops

- A. Cultures under MLT/ART/OFT
- B. Action plan: 2023 - 2024
- C. Remarks on the Research Projects

VI. Crop Protection

- A. Technologies for Adoption/OFT/Information
- B. Action plan: 2023 - 2024
- C. Remarks on the Research Projects

VII. Remarks

VIII. List of Participants

I. FRUIT CROPS

A. Cultures under MLT/ART/OFT

(i) Varieties and Technologies identified for release (2024)

1. Elite Muscat Hamburg, MHC 5 (TGC - 126), GRS, Theni

Medium vine vigour and high fruitfulness. Bunches are medium sized (325 to 350 g) & berry diameter of 12-15 mm. High TSS (24-26 ° brix) in winter pruning crop harvested in March-April and moderate TSS (16-18 ° brix) during the summer pruning crop harvested in August-September. Potential yield of 18 kg vine⁻¹ (winter pruning) and 25 kg vine⁻¹ (summer pruning).

2. AH-2 Jackfruit (Muthandikuppam), HC&RI, Periyakulam

Clonal selection from germplasm maintained at HC&RI, Periyakulam. Regular and off-season bearer with cluster (2-3 fruits/cluster) bearing habit (78 fruits/tree/year). Bears twice in a year during Mar - May & Nov – Dec. Medium to large sized fruits (11.5 kg) with high TSS (25.0° Brix) and pleasant aroma. Yellow sweet flakes with firm consistency. High yield of 897 kg /tree/year (139.93 t/ha). So far 10 years data recorded and documented.

3. Cost effective multiplication of Timla fig (*Ficus auriculata*) through Air Layering using Growth Regulators, HRS, Yercaud

Selection of semi-hard wood shoot (10-14 mm thickness) of previous year growth. Removal crowded leaves. Incision made 1 foot below from the tip of the shoot leaving 5-10 cm gap from the origin. Peel-off the bark from 20 mm width incision made on the shoot and swab with IBA @ 3000 ppm on the peeled area. Wet decomposed coir pith to be placed over the cut surface and excess water was squeezed. Wrapped with poly sheet and both ends should be tied with thread. Half cut should be given 60 days after layering and detach the layer from the tree after 90 days. Place it in the polybag (12x8") with pot mixture and keep it under mist chamber for 30 days. After emergence of new sprouts keep it in the Shadenet house for sale. Success percentage: 64.07 %. CB ratio 3.61; Control (39.63 % and 1.88)

(ii) Cultures under MLT/ART/OFT

a. Crop Improvement

1. Mango pre-release culture: MI 25 *Natham paalpushpam* (HC&RI, Periyakulam)

Mango MI 25 (*Natham paalpushpam*) is a clonal selection from Natham local. The tree is semi-spreading, regular bearing habit with a high yield potential of 540 kg/tree (15 years). Fruit weight is 240 g /fruit with high TSS (19.4° Brix). Brown colour tinge is observed from stalk end to distal end. Suitable for off season mango production during Sep - Oct (220kg/tree). So far 11 years data recorded and documented. Two years MLT data recored and is in progress.

2. Pickling mango genotypes for yield and quality attributes (HC&RI, Periyakulam)

Nine pickling mango genotypes were evaluated in the existing field gene bank for yield and quality attributes. Among the genotypes evaluated, MI-PM 07 recorded the highest tree height (2.97m), trunk circumference (16.2 cm) and canopy volume (4.86 m³). The genotype MI-PM 03 registered the highest number of fruits/panicle (27.55), fruit setting percentage (2.52), number of fruits/tree (146.04), fruit yield/tree (5.64 kg) and acidity (3.65 %) followed by MI-PM 07. So far four years data recorded and documented. Two years MLT data recored and is in progress.

3. Annur 5 - genotype with year-round mango production (Culinary purpose-Pickling Mango) (HC&RI, Coimbatore)

Out of 25 genotypes, 10 genotypes flowered throughout the year and among the 10 genotypes, Annur 3, Annur 5, and Annur 8 exhibited uniformity in flowering and fruiting in 3 seasons (Apr-May, Oct- Nov and Jan-Feb) recorded for five years. Annur 5 - special characters are Fruit weight is 110.5g, TSS is 14.20 Brix, No. of fruits/tree is 453, Fruit yield /tree is 50.06 kg.

4. Banana pre-release culture: NPH -02-01 (AAB) (HC&RI, Coimbatore)

It is a hybrid of H 201 (AB) x Anaikomban (AA), akin to Ladan (AAB) with yield potential of 17-21 kg/bunch and resistant to nematode (root lesion index 2 and corm lesion index 1) and tolerant to Fusarium wilt (corm DSI 23.33). Total number of fingers per bunch is 215 with a finger weight of 75-80g. It is moderately sweet with a TSS of 16.8 ° Brix and suitable for ratoon crop under mat system of cultivation in hills

5. Papaya pre-release culture: C1-33 (HC&RI, Coimbatore)

It is a hybrid derivative of CP-96 x TNAU Papaya CO8. The selection was made during the F4 generation. This culture produces on an average 45 fruits/tree, average fruit weight is 1.50 kg. Yield/tree is 68-70 kg/ in a cropping season of 14 months. Estimated yield is 200t/ha with the TSS of 13.0°brix. The cavity index is 23.00. Pulp thickness is 3.0 cm. This variety resembles Red Lady with firm flesh but free from papain flavor. PRSV rating is 5.0

6. Intergeneric hybrid progenies of papaya (*Carica papaya* L.) for PRSV resistance (HC&RI, Coimbatore)

Five advanced intergeneric hybrids (8th generation) of papaya were evaluated along with their parents CP50 and *Vasconcellea cauliflora*. Among them three promising advanced intergeneric hybrids with high yield potential, less PRSV score and good quality were selected for further evaluation.

S. No.	Advanced intergeneric hybrids	Fruit weight (kg/fruit)	Yield (kg/tree/first crop)	PRSV score
1.	CPV-2-15-7-1-2	1.8	98	3
2.	CPV-2-12-7-1-19	1.5	72	3
3.	CPV-2-19-27-37-8	1.5	58	3

7. Guava with soft seeds, pink pulp and high TSS (HC&RI, Coimbatore)

The results of ICP-MS analysis of two best performing genotypes (PG 1–7 and PG 34–1) and its parent Arka Kiran, revealed that PG 1–7 and PG 34–1 registered higher level of mineral contents when compared to its parent Arka Kiran. The salient features of Sel. PG 1-7 are as follows; Average fruit weight of 210g, Pulp firm and pink in colour, TSS of 12.6° Brix, Ascorbic acid of 194.73 mg per 100g pulp, Lycopene content of 6.40 mg / 100g, Seed hardness- 5.08 kgf, No. of seeds / fruit – 310.

8. Acid lime genotypes for year-round production (CRS, Sankarankovil)

It is a seedling selection from Puliyanudi local (SNKL-19). It bears fruits throughout the year. The average number of fruits per tree per year is 1160 with average fruit weight of 58.0 g. It has high acidity (6.740%), TSS (8.3°Brix), juice content (54.1%) and ascorbic acid content (29.30 mg/100g). It is a high yielder with 61.48 kg per tree (16.60 t/ha). It is less susceptible to leaf miner, citrus fruit fly, mites and dieback. Yield increase over the control (PKM 1) is 26.62 %. It is suitable for Alfisol and Vertisol regions.

9. Promising Jack Genotype – AH 114 (Tirurkuppam local) (VRS, Palur)

This genotype was collected from a farmer's field at Tirurkuppam. This genotype bears compact fruits weighing from 2.5 kg to 4 kg which is most suited for nuclear family and urban dwellers. The flakes are soft and orange-yellow colour. Flakes exhibit TSS of 38° Brix, which is the highest recorded among the collections made until at VRS, Palur. This genotype bears fruits throughout the year. This genotype is resistant to fungal infections in all the seasons. The average yield is about 90 fruits per year per tree.

10. Elite genotype in Avocado for high yield with medium sized fruits akin to Hass (HRS, Thadiyankudisai)

Avocado culture TKD PA 82 is a selection from germplasm available in Horticultural Research Station, Thadiyankudisai and exhibits 'A' type flowering habit. The fruits are medium sized and pyriform in shape with an average weight of 290g/fruit. The length of the fruits ranged between 12-15 cm and the diameter of fruits is 9-10 cm. The skin colour is parrot green with smooth surface and thin skin. It is a cluster bearing type with average fruit weight of 280g to 330g/fruit. The fruit pulp is having smooth texture and creamy yellow in colour

b. Crop Management

1. Standardization of application method and field evaluation of potash releasing bacterial isolates for banana (AC&RI, Killikulam)

The two bacterial isolates from banana rhizosphere namely *Rhizobium pusense* KRBKMM1 and *Stenotrophomonas maltophilia* KRBKMM2 were identified as efficient Potash Releasing Bacteria for banana. Field experimentation with banana cv. Rasthali in garden land condition revealed the significant influence of the Potash Releasing Bacteria on yield and yield attributing parameters. Application of 75% NPK+5 g *Azospirillum*+5 g PSB + 2 ml KRB (1 ml each of KKM banana isolate 1&2) per pit at the time of planting and on 5th month of planting) or application of 75 % NPK+5 g *Azospirillum*+5 g PSB per + 4ml

KRB (2ml each of KKM banana isolate 1&2) per pit at the time of planting and on 5th month of planting) influenced the yield and yield attributing parameters of banana compared to untreated control [100% NPK (110:35:330g NPK/plant)- (check I) &100% NPK+5 g Azospirillum+5g PSB per pit at the time of planting and on 5th month of planting (Check II)]. BC ratio indicated a positive influence of KRBs on net return

2. Effect of nutrient formulation on yield, quality and PRSV incidence in papaya (HC&RI, Coimbatore)

Foliar application of nutrient formulation @ monthly interval from 3rd MAP till 7th MAP along with recommended NPK dose (50:50:50 g/plant) at bimonthly interval from 3rd MAP registered 33.89 % increase in yield with lesser incidence of PRSV than control (RDF alone) in TNAU Papaya CO 8.

NF spray + RDF	Parameters	Control (RDF alone)
85.24	First fruiting height (cm)	99.40
62.80	Number of fruits / plant	52.26
1.37	Average fruit weight (kg)	1.10
86.0	Estimated yield/plant (kg)	57.8
245	Estimated yield / ha (t)	170
33.89%	% increase in yield	-
30.76 (33.70)	PRSV incidence (%)	45.87 (42.65)
3.40	Shelf life (days)	6.60
6.12	Dry latex yield/ fruit (g)	5.02
3.8	B C ratio	1.5

B. Action Plan: 2022-2023

a. Crop Improvement				
MANGO				
Theme 1: Identification and evaluation of traditional mango genotypes of Tamil Nadu				
Sub theme 1: Survey, identification, documentation and conservation of elite seedling progenies of mango genotypes for economic parameters				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	Evaluation of mango varieties for off season round the year bearing	HC&RI, Coimbatore	<ul style="list-style-type: none"> Off season genotype (Annur-5) to be evaluated using 13-1 as rootstock and given for MLT IC numbers to be obtained from NBPGR, New Delhi 	Identification of Annur-5 grafted with 13-1 mango root stock
2.	Evaluation of pickling mango genotypes and Coloured Mango for yield and quality attributes	HC&RI, Periyakulam	<ul style="list-style-type: none"> Identified pickling genotype (MI-03) to be multiplied for evaluation (MLT). Evaluation of Coloured Mango hybrids for region specific suitability. IC numbers to be obtained from NBPGR, New Delhi 	Identification of Coloured Mango hybrids for region specific suitability

3.	Identification of seedling progenies with superior characters	RRS, Paiyur	<ul style="list-style-type: none"> The seedling progenies identified P-MI-1 (Selection from Mulgova – Regular bearer) and P-MI-4 for further evaluation. IC number to be obtained from NPBGR and molecular profiling for the above genotypes to be carried out. 	Identification of mango for regular bearing Mulgova
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BANANA				
Theme 1: Improvement of banana through hybridization				
Sub theme 1: Breeding banana to develop Hybrids / varieties similar to commercial varieties (<i>Rasthali</i>) for resistance / tolerance to nematode wilt complex				
S. No.	Activity	Centre	Action plan for 2023 - 2024	Deliverables
1.	Breeding programme to be continued to develop resistance to nematode wilt complex in <i>Rasthali</i> (AAB) using synthetic diploid, triploid and tetraploid hybrids HC&RI, Coimbatore	HC&RI, Coimbatore	<ul style="list-style-type: none"> Banana breeding to be continued in <i>Rasthali</i> through hybridization and selection Monthly planting of <i>Rasthali</i> (AAB) and the seasonal influence on seed setting in <i>Rasthali</i> to be continued. 	Development of progenies in <i>Rasthali</i> improvement

PAPAYA				
Theme 1: Improvement of papaya through breeding approaches				
Sub theme 1: Development of inter-generic hybrids with Papaya RingSpot Virus tolerance				
S. No.	Activity	Centre	Action plan for 2023-2024	Deliverables
1.	Selection of a promising inter-generic hybrid with PRSV resistance , yield and quality	HC&RI, Coimbatore	<ul style="list-style-type: none"> Promising intergeneric hybrid derivative CPV-2-15-7-1-2 is to be multiplied and given for MLT 	Development of intergeneric hybrid derivative- Dioecious (CPV – 2-15 -7-1-2) with PRSV tolerance
Sub theme 2: Development of improved gynodioecious varieties for high yield, better quality attributes and PRSV tolerance				
1.	Evaluation and purification of identified gynodioecious selection (C1-33) in F ₈ generation and forwarding to MLT Development of new F ₁ hybrids of gynodioecious types with thermo stability and PRSV tolerance	HC&RI, Coimbatore	<ul style="list-style-type: none"> The gynodioecious culture C1-33 (F₈ generation) to be advanced for MLT with check var. Red Lady and Sinta. Crossing programme to be continued for developing gynodioecious F₁ hybrids with thermo stability and PRSV tolerance. 	Development of gynodioecious culture (C1-33) with PRSV tolerance

ACID LIME				
Theme 1: Improvement of acid lime				
Sub theme 1: Evaluation and identification of superior acid lime types				
S. No.	Activity	Scientist & Centre	Action plan for 2023-2024	Deliverables
1.	Collection and evaluation of accessions bearing bigger sized fruits, thornless, seedless and superior qualities	CRS, Sankarankovil	<ul style="list-style-type: none"> The identified promising genotype SNKL 19 compared with check var. PKM 1 for bigger size fruits, yield and quality 	Development of promising genotype in acid lime (SNKL 19)
2.	Breeding for thornless and less seeded varieties	HC&RI, Periyakulam	<ul style="list-style-type: none"> Evolving dwarf, thornless and less seeded mutants 	Identification of dwarf, thorn less, seedless acid lime

MANDARIN ORANGE				
Theme No 1: Collection and enrichment of mandarin orange germplasm				
Sub theme 1: Evaluation of mandarin orange varieties suitable for Shevroy hills				
S. No.	Activity	Scientist & Centre	Action plan for 2023-2024	Deliverables
1.	Evaluation of the existing germplasm and identification of suitable varieties for Shevroy hills	HRS, Yercaud	<ul style="list-style-type: none"> Germplasm evaluation alternative to kodai mandarin suitable for commercial exploitation for Shevroy hills and subtropical regions of TN. Region specific 	Identification of alternative to kodai mandarin

GRAPES				
Theme 1: Improvement of grapes through breeding approaches				
Sub theme 1: Evaluation of grapes varieties (<i>Vitis vinifera</i> L. and <i>Vitis labrusca</i> L.), for yield, quality, biotic and abiotic tolerance				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	New clones for drought and salinity tolerance	GRS, Theni	<p>Screening the grapes genotypes against salinity and drought tolerance</p> <p>To test verify the best performing types by imposing salinity treatment under polyhouse condition</p> <p>To estimate the drought hardiness with physiological parameters <i>viz.</i>, Chlorophyll stability index, Relative water content, proline content, total soluble protein.</p>	Development of new grapes variety for drought and salinity tolerance

GUAVA				
Theme 1: Improvement of guava through breeding approaches				
Sub theme 1: Screening of open pollinated (OP) progenies and hybrid derivatives for red pulp, soft seeded and high yield				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	Multiplication of selected OP seedling progenies of red pulp and soft seeded.	HC&RI, Coimbatore	Identified PG 1-7 to be multiplied and assessed for its yield and quality performance with Arka Kiran as check and given for MLT to SHF, KVK and farmer's field	Development of soft seeded red flesh variety in guava

JACK FRUIT				
Theme 1: Collection, evaluation and identification of high yielding and quality jackfruit				
Sub theme 1: Evaluation of elite jackfruit genotypes				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	Promising cultures of jack fruit may be evaluated	VRS, Palur AC&RI, Kudumiyanmalai HRS, Pechiparai	10 accessions viz., KDM AHJ46, 08, Rudraksha, Surya, Kalasthri, Thurkare, Senthura, Ayiramkaachi, Vietnam Early super and Siddu are to be evaluated along with check varieties PLR1, PLR 2, red flesh jackfruit and Shankara is to be continued	Identification of best types in Jack for quality and yield
		HC & RI, PKM	The off-season genotype AH-2 will be focused for variety release during 2023-24. Bio chemical profiling was carried out for AH2 viz., TSS, titrable acidity (%), TSS: TA, Moisture content (%), Ash (%), vitamin A(IU), Vitamin C (mg 100 ⁻¹), potassium (mg 100 ⁻¹), phosphorus (mg 100 ⁻¹), Magnesium (mg 100 ⁻¹), calcium (mg 100 ⁻¹), Sodium (mg 100 ⁻¹), iron (mg 100 ⁻¹), Zinc (mg 100 ⁻¹), total antioxidant activity(μ/g)	Identification of off-season bearing type in Jack

SAPOTA				
Theme 1: Improvement of sapota through breeding approaches				
Sub theme 1: Screening of open pollinated (OP) progenies for dwarfness and high yield				
S. No.	Activity	Centre	Action plan for 2023 - 2024	Deliverables
1.	Identification of promising types from existing OP population of PKM 1	HC&RI, Periyakulam	Identified dwarf half sib progeny (MA-9-2) to be multiplied for large plot evaluation for yield and quality HDP System under dry land condition	Identification of dwarf variety in sapota suitable for HDP

ARID ZONE FRUITS				
Theme 1: Collection and evaluation of Arid zone fruits				
Sub theme 1: Varietal evaluation of Arid zone fruits				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	Evaluation of Fig and Apple ber varieties for commercial exploitation	HC&RI, Coimbatore	Best performing varieties including Timla Fig are to be identified for commercial exploitation and is to be continued	Identification of new fruit crop in arid zone fruits for commercial exploitation
2.	Evaluation of elite custard apple (<i>Annona squamosa</i>) types from Dharmapuri, Krishnagiri and Natham regions under semi-arid vertisol conditions.	RRS, Aruppukottai	Promising genotypes AS – 18 (higher fruit yield) and AS – 23 (year-round fruiting) for semiarid and verisol conditions.	Identification of anona for year-round fruiting habit

3.	Collection and evaluation of underutilized fruit crops Crops: Ber, Aonla, Annona, Jamun, Manila Tamarind, Wood apple and Fig	HC & RI, PKM, RRS, APK & HC&RI (W), Trichy	Evaluation of underutilized fruit crops suitable for dry tracts to be continued	Identification of underutilized fruits crop for dry tracts
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SUB -TROPICAL FRUIT CROPS				
Theme 1: Collection and enrichment of sub tropical fruits				
Sub theme 1: Collection and evaluation of avocado genotypes suitable for lower Pulney hills				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	Elite avocado genotypes may be multiplied at HRS, Thadiyankudisai and distributed to HRS, Pechiparai, HRS, Yercaud and farmers of lower Pulney hills for simultaneous evaluation.	HRS, Thadiyankudisai HRS, Pechiparai HRS, Yercaud	Hass type TKD PA - 82 (Small seed, high fat content) to be multiplied and tested at different places.	Identification of small fruited avocado like Hass
Theme 2: Collection and evaluation of litchi genotypes / varieties for lower Pulney hills				
Sub theme 1: Collection and evaluation of litchi genotypes / varieties for lower Pulney hills				
1.	Evaluation of litchi genotypes / varieties	HRS, Thadiyankudisai, HRS, Yercaud	Off season and regular bearing litchi genotypes/varieties for lower Pulney hills and subtropical region of TN.	Identification of the best litchi genotype for sub tropical regions in TN
TEMPERATE FRUIT CROPS				
Theme No 1: Collection and enrichment of temperate fruit crop varieties				
Sub theme 1: Evaluation of low chill temperate fruit crops				
S. No.	Activity	Scientist & Centre	Action plan for 2023 - 2024	Deliverables
1.	Evaluation of low chilling temperate fruit crop varieties of pear, peach and plum	HRS, Ooty HRS, Kodaikanal	The low chilling temperate fruits collected from CITH, Srinagar, PAU, Ludhiana and G.B. Pant University, Pantnagar will be evaluated for region specific suitability	Identification of low chilling types in temperate fruits
2.	Evaluation of low chilling pear varieties	HRS, Yercaud	The CITH released varieties will be evaluated for yield and quality under mid and high chill condition.	Identification of low chilling types in pear

b. Crop Management

MANGO				
Theme No 1: Optimizing the factors responsible for increasing the production				
Sub theme 1: Evaluation of mango varieties under UHDP				
S. No.	Activity	Scientist & Centre	Action plan for 2023- 2024	Deliverables
1.	Performance of different varieties	HC & RI, Coimbatore	The mango varieties (Imam Pasand, Alponso and Neelum in Periyakulam : Imam Pasand, Banganapalli, Salem	Identification varieties suitable for UHDP

	under UHDP may be assessed	HC & RI, Periyakulam	Bangalura and Bangalura in Coimbatore under UHDP system to be assessed for yield	
Sub theme 2: Identification of suitable rootstocks for dwarfness / abiotic stresses				
1.	Evaluation of rootstocks viz., Cyber, 13-1 and 4-9 for salinity tolerance	HC&RI, CBE, RRS, Paiyur and HC&RI, PKM	Root stocks viz., Cyber, 13-1 and 4-9 to be assessed for salinity tolerance- and the work has to be continued	Identification of suitable rootstock for salinity condition for mango
BANANA				
Theme No 1: Standardization of protocol for mass multiplication of banana				
S. No.	Activity	Scientist & Centre	Action plan for 2023- 2024	Deliverables
1.	Standardization of protocol for mass multiplication of TNAU released varieties (CO 2 and CO 3)	HC & RI, Coimbatore	The protocol standardization for mass multiplication of CO 2 and CO 3 banana to be continued through direct organogenesis. Multiplilation ratio yet to be arrived. Plants are in rooting stage in the media	Development of protocol for mass multiplication of TNAU released varieties

PAPAYA				
Theme No 1: Grafting technology in papaya				
Sub theme 1: Evaluation of grafts in field				
S. No.	Activity	Centre	Action plan for 2023- 2024	Deliverables
1.	Validation of grafting technology in Papaya	HC & RI, Coimbatore	The papaya grafts will be compared with seedling for yield, quality and PRSV incidence	Development of grafting technology in Papaya
Theme No 2: PRSV management through cultural practices				
Sub theme 1: Standardization of package of practices for PRSV management				
1.	Testing of nutrient formulation for PRSV management	HC&RI, Coimbatore	Nutrient formulation to be compared with the existing PRSV management practices and large-scale demonstration to be done (OFT)	Development of nutrient formulation for PRSV management for papaya
ACID LIME				
Theme No 1: Quality planting material production				
Sub theme 1: Quality acid lime seedling production				
1.	Production and distribution of acid lime	HC&RI, PKM CRS, Sankarankovil	Identification of mild strain for tristeza virus in acid lime. Production of acid lime seedling of released varieties and buded with strip of bark from mild strain virus acid lime plant and distribution of pre immunized acid lime seedlings (PIALS)	Production and distribution of acid lime planting materials for farmers

GUAVA				
Theme No 1: Nematode and wilt management in Guava				
Sub theme 1: Evaluation of guava grafts on different rootstocks				
1.	Assessing the performance of guava grafts on different rootstocks from IIHR and CISH	HC&RI(W), Trichy HC&RI, PKM HC&RI, CBE	Identifying best compatible rootstock for guava for nematode management. Five wild related species viz., <i>P. chinensis</i> , <i>P. friedrichsthalianum</i> , <i>P. cattleianum var cattleianum</i> , <i>P. cattleianum var lucidum</i> and <i>P eugeniaefolia</i> will be utilized for the grafting study	Nematode management through grafting with resistant rootstocks
2.	Nematode management through foliar nutrition	HC&RI, CBE	Nematode affected farmers fields will be sprayed with nutrient formulation (Micro, macro and Plant growth regulator) two times, first at bud initiation stage and second at 30 days after first spray.	Development of foliar nutrition formulation for nematode management
GRAPES				
Theme No 1: Enhancement of yield and quality				
Sub theme 1: Evaluation of commercial grapes varieties under "Y" trellis training system				
1.	Assessing the yield and quality potential of grape varieties under "Y" trellis system	GRS, Theni	Assessment of yield and quality of potential grape varieties under "Y" trellis system of training to be continued for another two seasons	Identification of alternate training system for grapes instead of pandal system

C. Remarks on the Research Projects

a. Crop Improvement

S. No.	Name of the Projects	Name of the Scientist	Period	Remarks
A. MANGO				
1.	HCRI/ PAI/ HOR/ FRU/ 2019/ 004 Survey, identification and evaluation of superior seedling progenies in mango	Dr. B. Senthamizhselvi	Oct, 2019 - Sep, 2023	May be continued; Genotypes have to be documented with NBPGR descriptor including geographical Identification
2.	HCRI/ CBE/HOR/FRU /2020/002 Evaluation of mango varieties suitable for UHDP in mango	Dr. V. Sivakumar Dr. I. Muthuvel Dr. K. Vanitha	May, 2020- Aug 2026	The project to be continued
3.	HCRI / PKM / HOR/ FRU/ 2021 /001 Evaluation of picking mango genotypes (<i>Mangifera indica</i> L.) in the existing field gene bank for yield and quality	Dr. J. Rajangam	Mar, 2021- Feb, 2024	The project to be continued
4.	HC&RI/CBE/ / FRU/ HOR 2023/001 Performance evaluation of 13-1 mango rootstock in calcareous soils at university orchard	Dr. I. Muthuvel Dr. V. Sivakumar	Mar, 2023 - Mar, 2026	The project to be continued

S. No.	Name of the Projects	Name of the Scientist	Period	Remarks
B. PAPAYA				
5.	HCRI/CBE/HOR/FRU/2020/001 Development of a dwarf gynodioecious papaya variety through induced mutagenesis and selection from segregating OP progenies	Dr. D. Vidhya	Oct, 2019 - Sep, 2022	Project may be closed and completion report may be submitted
6.	HCRI/CBE/HOR/FRU/2021/002 Development of F ₁ hybrids in gynodioecious papaya with tolerance to PRSV and thermo-stability suitable for tropical conditions	Dr. K.A Shanmugasundaram Dr. I. Muthuvel Dr. J. Auxilia	Jan, 2021 - Dec, 2024	The project to be continued
7.	HORT/CBE/FRU/HOR/2023/001 Collection, conservation and evaluation of papaya (<i>Carica papaya</i> . L) germplasm	Dr.I. Muthuvel Dr. D. Vidhya	Sep, 2021 - Sep, 2024	The project to be continued
C. GUAVA				
8.	HCRI/CBE/HOR/FRU/2013/003 Improvement of guava (<i>Psidium guajava</i>) through selection and inter-varietal hybridization	Dr. M. Kavino	July, 2017 - July, 2022	Project may be closed and completion report may be submitted
9.	HCRI/TRY/HOR/FRU/2020/001 Screening and evaluation of guava genotypes and species for biotic and abiotic stress tolerant root stocks	Dr. V.P. Santhi	Jan, 2020- Dec, 2022	Project may be closed and completion report may be submitted
D. ACID LIME				
10.	HCRI/SAN/HOR/FRU/2017/001 Survey and identification of suitable acid lime genotypes for year-round production	Dr. C. Rajamanickam	Aug, 2017- Mar, 2023	Project may be closed and completion report may be submitted
11.	HCRI/SAN/HOR/FRU/2018/001 Evaluation and identification of root stocks for improvement of yield and quality of acid lime (<i>Citrus aurantifolia</i> Swingle.)	Dr. C. Rajamanickam	Oct, 2018- Sep, 2022	Project may be closed and completion report may be submitted
E. MANDARIN ORANGE				
12.	HCRI/YCD/HOR/FRU/2016/001 Survey, collection and evaluation of Mandarin orange varieties under Shervaroy condition	Dr. V.A. Sathiyamurthy	Jan, 2017- Jun, 2024	The project to be continued
F. GRAPES				
13.	HCRI/TNI/HOR/FRU/2020/002 Collection and evaluation of elite clones of grapes (<i>Vitis vinifera</i> L.) var. Muscat Hamburg	Dr. A. Subbiah	Oct, 2020 - Sept, 2023	Project may be closed and completion report may be submitted
14.	HORT / CBE /FRU / HOR / 2023 / 003 Collection conservation and evaluation of grapes genotypes suitable for export under Coimbatore condition	Dr. I. Indurani Dr.K.A. Shanmugasundaram Dr. I. Muthuvel	Jan, 2023 – Dec, 2026	The project to be continued

S. No.	Name of the Projects	Name of the Scientist	Period	Remarks
G. JACKFRUIT				
15.	HCRI/KDM/HOR/FRU/2020/001 Multiplication and evaluation of identified elite jackfruit genotypes in farmers' holding of Pudukottai district	Dr. K. Kumanan	Jan.2020 - Dec, 2022.	Project may be closed and completion report may be submitted
16.	HCRI/PKM/HOR/FRU/2021/001 Evaluation of jackfruit (<i>Artocarpus heterophyllus</i>) genotype AH15 in large area plot	Dr. K. R. Rajadurai	Apr, 2021- Mar, 2024	The project to be continued
17.	HORT/PKM/FRU/HOR/2023/100 Evaluation of Jackfruit (<i>Artocarpus heterophyllus</i> Lam.) genotypes for enhanced nutraceutical properties	Dr. K.R. Rajadurai Dr. T. Anitha	Jan, 2023 - Dec, 2025	The project to be continued
H. JAMUN				
18.	HCRI/APK/HOR/FRU/2019/001 Evaluation of jamun genotypes and crop regulation practices suitable for dry vertisol condition	Dr. C. Subesh Ranjith Kumar	Oct, 2019 - Sep, 2024	The project to be continued
19.	HCRI/PKM/HOR/FRU/2021/004 Collection and evaluation of Jamun genotypes (<i>Syzygium cumini</i> skeels) for identifying regular bearing types	Dr. S. Muthuramalingam	Aug, 2021- Dec,2024	The project to be continued
I. SUB TROPICAL AND TEMPERATE FRUITS AND ARID ZONE FRUITS				
20.	HCRI / KKL / HORT / 2021/ 001 Evaluation of released varieties of Pear suitable for Upper Pulney Hills	Dr. C. Ravindran	Apr, 2021 - Mar,2026	The project to be continued
21.	HCRI / KKL / HORT / 2021/ 002 Performance evaluation of strawberry varieties suitable for Upper Pulney Hills	Dr. C. Ravindran	May 2021- Mar, 2023	Project may be closed and completion report may be submitted
22.	HCRI /TKD/HOR/FRU /2019/002 Evaluation of avocado (<i>Persea americana</i> Mill.) genotypes for yield and quality under the lower Pulney hills	Dr. R. Balakumbahan	Jan, 2019 - Dec, 2024	The project to be continued
23.	HCRI/TKD/HOR/FRU/2019/001 Evaluation of Litchi (<i>Litchi chinensis</i> Sonn) genotypes/varieties for growth, yield and quality.	Dr. R. Balakumbahan	Aug, 2019 - July 2024	The project to be continued
24.	HCRI/YCD/HOR/FRU/2019/002 Performance evaluation and identification of avocado (<i>Persea americana</i> Miller), litchi (<i>Litchi chinensis</i> Sonn.) and Jamun (<i>Syzygium cuminii</i> Skeela) genotypes/varieties for high yield and quality suitable for Shevaroy hills.	Dr. V.A. Sathiyamurthy	Dec,2019- Dec 2025 -	The project to be continued, continuation proposal may be given
25.	HCRI/TRY/HOR/FRU/2021/001 Collection and evaluation of underutilized fruit crops suitable for dry tracts of Trichy region (Trichy, Ariyalur, Perambalur and Karur)	Dr. V. Jegadeeswari	July, 2021 - Dec,2025	The project to be continued

S. No.	Name of the Projects	Name of the Scientist	Period	Remarks
26.	HCRI/APK/HOR/FRU/2021/001 Phenotypic evaluation and molecular characterization of Custard apple (<i>Annona squamosa</i>) for the selection of superior types suitable under dry vertisol condition	Dr. C. Subesh Ranjith Kumar	Oct, 2021 - Sep, 2024	The project to be continued

b. Crop Management

S. No.	Name of the Project	Name of the Scientist	Period	Remarks
A. MANGO				
1.	HCRI/PKM/HOR/FRU/2021/00 Standardization of fertigation scheduling in mango (<i>Mangifera indica</i> L.) under HDP var. Neelum and Imam Pasand	Dr. S. Saraswathy	July 2021- Jun,2024	The project to be continued
2.	HORT/JEE/HOR/2023/001 Studies on the effect of plant growth regulators on the fruit retention and fruit drop of mango (<i>Mangifera indica</i> L.) cv. Bangalora and Alphonso	Dr. S. Srividhya Dr. P. Thilagam	Dec, 2022 - Dec, 2025	The project to be continued
B. BANANA				
3.	HCRI/CBE/HOR/FRU/2020/003 Standardization of organic nutrient practices for banana cv. Neypoovan and CO 2	Dr. K.B. Sujatha	July, 2020 - Jun, 2022	May be closed and completion report may be submitted
4.	HCRI/CBE/HOR/FRU/2020/004 Standardization of <i>in vitro</i> propagation protocol for mass multiplication in TNAU banana hybrids	Dr. C. Kavitha	Dec, 2020 - Nov, 2023	The project to be continued
5.	HCRI/ECK/HOR/FRU/2021/001 Optimizing the spacing of banana CV. Poovan (<i>Musa</i> spp.) for high density planting under coconut eco system in Cauvery Delta Zone of Tamil Nadu for leaf yield	Dr. K.S. Vijai Selvaraj	Mar, 2021 – Feb.2024	The project to be continued
6.	DEE/KVK, MDU/HOR/2021 /001. Influence of weather and soil parameters on yield and quality of banana cv. Muppattai (<i>Desi</i> variety) at Madurai Dt.	Dr. P. Arul Arasu Dr. S. Krishnakumar Dr. E. Subramanian	Mar, 2022- Feb, 2025	The project to be continued
7.	CPMB IECKTDCI/HOR/001 <i>In vitro</i> mutation and development of resistance in Banana cv. Rasthali (AAB) against native isolates of <i>Fusarium</i>	Dr. P. Sivakumar	Nov, 2021- Oct, 2024	The project to be continued
8.	HORT/TRY/HOR/2023/001 Effect of foliar and bunch spray nutrition on yield and quality of banana cv. 'Ney Poovan' (AB) under Delta regions	Dr. R. Jayavalli Dr. R. Arulmozhiyan Dr. P. Paramaguru	Dec, 2022 – Dec, 2025	The project to be continued

S. No.	Name of the Project	Name of the Scientist	Period	Remarks
9.	HORT/TRY/FRU/HOR/2023/001 Evaluation of commercial banana cultivars through tissue culture plants against conventional suckers for yield and quality	Dr. V. Krishnamoorthy	June, 2022 - July, 2024	The project to be continued
C. PAPAYA				
10.	HCRI/CBE/HOR/FRU/2021/002 Studies on inter-varietal and inter-generic grafting in papaya to combat sex forms and Papaya Ring Spot Virus (PRSV)	Dr. J. Auxilia	Jan,2021- Dec,2024	The project to be continued
11.	HCRI/CBE/HOR/FRU/2021/001 Standardization of <i>in vitro</i> propagation protocol for dioecious papaya.	Dr. C. Kavitha Dr. I. Muthuvel	Mar, 2021 - Feb, 2024	The project to be continued
D. GUAVA				
12.	HC&RI/NRM/PKM/AGM/2021 /001 Bioformulation of Methylobacterium for controlling root knot nematode <i>Meloidogyne enterolobii</i> in guava	Dr. R. Poorniammal	Nov, 2020- Oct, 2023	The project to be closed
13.	NRM/TRY/FRU SCI /HOR /2021 /001 Development of leaf nutrient norms and identification of yield-limiting nutrients using DRIS approach in Guava (<i>Psidium guajava</i> L.)	Dr. T. Sherene Jenita Rajammal Dr. Thangaselvbai Dr. M. Baskar	Dec, 2021- Dec, 2024	The project to be continued
14.	HORT / KVK/TVM / HOR / 2022 / 001 Studies on leaf propagation of Guava (<i>Psidium guajava</i> L.)	Dr. R. Neelavathi Dr. C. Indu Rani	Feb, 2022 - March, 2024	The project to be continued
15.	HORT / CBE /FRU / HOR / 2023 / 002 Intra Interspecific graft compatibility studies on of guava nematode resistance / tolerance	Dr. K.A. Shanmugasundaram Dr. I. Muthuvel Dr. I. Indurani	Jan, 2023 - Dec, 2026	The project to be continued
E. GRAPES				
16.	HCRI/TNI/HOR/FRU/2020/001 Evaluation of commercial varieties on dogridge rootstock under 'Y' trellis system in grapes	Dr. A. Subbiah	Oct, 2020 - Sep, 2023	The project to be continued
F. PEAR				
17.	HCRI/KDL/HOR/FRU/2017/001 Standardizing HDP for higher productivity and quality in Pear	Dr. C. Ravindran	Dec, 2017- Nov, 2021	The project to be continued
G. TIMLA FIG				
18.	HCRI/YCD/HOR/FRU/2019/001 Improvement of multiplication of timla fig (<i>Ficus auriculata</i>) through air layering using growth regulators	Dr. P.R. Kamalkumaran	Oct,2019 – Oct, 2022	May be closed and completion report may be submitted
H. ARID ZONE FRUITS				
19.	HORT/KKM/HOR/2022/001 Demonstration of TNAU Arid Zone fruit varieties under Killikulam condition	Dr. M. I. Manivannan	April 2022 - March 2025	The project to be continued

II. VEGETABLE CROPS

A. Cultures under MLT/ART/OFT

i. Varieties and Technologies identified for release (2024)

1. Brinjal culture CBE –SM- 03-17-21 (HC&RI, Coimbatore)

It is a hybrid derivative of the cross between CBE- SM - 13 x HD2 cross combination. Fruits are long, light purple with white stripes and cluster bearing with 2-3 fruits per cluster. Each plant bears 44.9 fruits with a single fruit weight of 55 g and potential yield of 2.20 kg %in crop duration of 150 days. The yield increase over the check variety CO 2 is 26.2 %. It showed 12.54 % shoot and fruit borer infestation.

S. No.	Trial details	No. of trials	Marketable Fruit yield /plant (kg)		Estimated Marketable Fruit yield /hectare (t)		Fruit and shoot borer incidence (%)	
			CBE-SM-03-17-21	CO 2 (Check)	CBE-SM-03-17-21	CO 2 (Check)	CBE-SM-03-17-21	CO 2 (Check)
1.	Station Trials	10	2.37	1.82	42.50	34.17	14.29	20.14
2.	MLT I	8	2.05	1.67	40.21	32.47	14.01	21.50
3.	MLT II	9	2.53	1.82	44.28	35.24	13.24	19.24
4.	ART Trials	60	2.32	1.75	41.53	33.94		
5.	OFT trials	10	Results yet to receive					
6.	AICRP (IET)	24	Results yet to receive					
7.	AICRP (AVT I)	24	Results yet to receive					

2. Cluster bean dwarf mutant APMC-021-10 (Dept. of Horticulture, AC & RI, Madurai)

Cluster bean APMC-021-10 is a dwarf statured, determinate non lodging mutant of MDU1 cluster bean. Plants are short statured (70cm to75cm) with long pods (15cm-16cm) of vegetable type. Pods are borne in clusters of 10-12 per cluster with short inter nodal length. Number of pods per plant is 115 to 125. Estimated pod yield is 10-12 tons /ha with protein content (2.60g), fibre (2.58g) and moisture content (87%). This mutant is with field tolerance for *Fusarium* wilt and Powdery mildew.

MLT results

S. No.	Parameters	Cluster bean (APMC-021-10)	Check (MDU-1)
1.	Plant height (cm)	76.5	155.0
2.	Days taken for first flowering	21	25.0
3.	Number of cluster per plant	12.0	21.0
4.	Pod length (cm)	12.5	12.9
5.	Pod weight (g)	3.5	2.23
6.	Number of pods per plant	190	150
7.	Pod yield per plant (g)	375	332
8.	Pod yield per hac (ton)	13.5	18.0
9.	Total duration (days)	75	135
10.	Powdery mildew incidence	Tolerant	Tolerant

*21 MLTI & 2 /OFT average in two seasons

* ART in Pipe line in 14 Districts of 140 locations

3. *Karumbu Murungai* PKM MO 65 (Perennial type) (HC&RI, Periyakulam)

PKM MO 65 is a selection from *Karumbu Murungai* (Perennial *Moringa*) identified at farmer's field near Devdhanapatti, Periyakulam. It is a high yielding type with the total fruit yield of 50-55 kg/tree/year with a long fruiting period (February to September). The number of fruits recorded were 400-450 fruits per tree. The fruit length and girth were 74.62 cm and 7.6 cm respectively. The fruit crude fibre content is 23.5% with high ascorbic acid content (108.2 mg/100 g). The data has been collected from 2019 to 2023.

4. TNAU PCH 1 cucumber (HC&RI, Coimbatore)

Fruits are delicious and have desirable marketable attributes like uniform cylindrical shape, dark green, glossy, non-hairy, tender skin and crispy flesh. This hybrid yields 6.52 kg of fruits per plant in 10-12 harvest within 40-45 days.

Performance of TNAU PCH 1 Cucumber

S. No.	Characters	Season 1 (Nov 2019)	Season 2 (Feb 2020)	Season 3 (Aug 2020)	Mean	KPCH 1	Multistar
1.	Days to first harvest	40.37	38.33	42.16	40.29	41.26	45.65
2.	Fruit length (cm)	16.66	17.24	16.98	16.96	15.50	16.03
3.	Fruit girth (cm)	9.34	9.05	9.27	9.22	9.50	9.34
4.	No. of fruits/plant	44.36	43.89	47.50	45.25	40.06	36.72
5.	Yield/plant (nos.)	6.45	6.37	6.74	6.52	5.87	5.04
6.	Yield/100 m ²	1207.8	1218.4	1236.9	1206.5	1084.9	932.2
7.	No. of harvest	11-13	12-15	13-15	10-12	8-9	7-8

5. Red *Amaranthus* A 193 (HC&RI, Coimbatore)

This is pulling and late bolting type. The leaves and stem are dark purple in colour with high anthocyanins suitable for container cultivation. It registered 12.8 t/ha of leaf yield within 25-30 days. It has low oxalates and nitrates with excellent cooking quality.

First red *Amaranthus* proposed from TNAU, Coimbatore. It was developed from the Dept. of Vegetable Science, Coimbatore. It is a selection from Mettupatti village of Virudhunagar Dt. Because of its late bolting trait, it is suitable for once over harvest. It has attractive dark red colored leaves and stems are dark purple in colour with high anthocyanin content (0.653 mg/100g) with good market preference and highly suitable for open field as well as container cultivation *viz.*, hydroponic, aeroponics and roof top gardening. It has good cooking quality and rich in vitamin and minerals (Iron 48 mg/100g and Calcium 41.5 mg/100g). The duration is 30-35 days with high yield potential of 12.6 t/ha. It has high antioxidant activity of 520 mg (AEAC units) and minimum nitrate content of 25.3 mg and 1.2 g of oxalates per 100g fresh weight of leaves. It has completed IET, AVT I and AVT II trials of AICRP (VC), ranking first among all the entries. The yield is 25.3 % increase over check variety Arun of KAU.

6. White *Amaranthus* AT6 (VRS, Palur)

White stemmed with vigorous root system with high biomass (45 g) when compared with CO 5 (12g). Yield potential is 10 t/ha as *mulai keerai* harvested at 30 days

and 33t/ha as thandu keerai on 50th day of harvest. Yield increase of 13 % over CO 5. Stem is less in fibre which is a preferred quality. Suitable for patio or container cultivation in homestead garden. Stem is highly branched in nature.

Dual purpose, green, less fibrous, attractive and succulent even at 50th day of sowing. Suitable for soup and salad recipes due to its attractive white colour. The colour of the stem remains white even after cooking. The crude fiber content was 1.3 % as against 1.7 % in CO 5, which makes it palatable and soft. White-stemmed *Amaranthus* (*Thandukeerai* type) AT6 registered 15 - 17% increased yield over CO 5 yield (10 t/ha as *Mulaikeerai* (30 days) and 33 t/ha as *Thandukeerai* (50 days). White *Amaranthus* culture AT6 is a promising high yielding variety suitable for north eastern zone of Tamil Nadu.

7. Organic manuring practices for quality improvement in Palak (*Beta vulgaris* var. *bengalensis*)

Recommended practice with inorganic fertilizers (Recommended practice (Apply FYM 25 t/ha, N PK 60:60:60 kg /ha) recorded more yield, but quality parameters were more in organic practices [Organic practice 1 (Soil application with Vermicompost (4t/ha) + liquid nitrogenous biofertilizers (Azospirillum 200 ml/ac) + foliar spray of vermiwash (3%), Organic practice 2 (Soil application with FYM (25t/ha) + liquid nitrogenous biofertilizers (Azospirillum 200 ml/ac) + foliar spray of Panchakavya (3%)]. Organic practice 1 had good keeping quality (> 72 hrs).

ii) Cultures under ART

1. Okra AE-CBE-02-CO 5 (HC&RI, Coimbatore)

It is an F₁ hybrid between AE-CBE-92 x ABE-CBE-921. The fruits are dark green and each weigh 27.96 gm. The fruit yield per plant is 1.1kg/ plant. It is resistant to both Yellow Vein mosaic virus and Enation Leaf Curl Virus.

2. Brinjal Hybrid Sm (GL) 01 (HC&RI, Coimbatore)

Fruit is long type borne in clusters of 4-5 with good market preference. The fruit colour is green with white striped at the bottom. These hybrid shows 12.1% shoot borer infestation and 13.0 % fruit borer infestation. The hybrid yields 4.20 kg/plant within 150-160 days.

3. Brinjal Hybrid Sm (GR) 01 (HC&RI, Coimbatore)

Fruits are round type with cluster bearing, light green with white striped at the bottom. It is heavy yielder and the shoot borer infestation is low when compared to check. This hybrid shows 7.19 % shoot borer infestation and 14.12 % fruit borer infestation. Number of fruits per plant is 78.91 and per plant yield is 3.45 kg in duration of 150-160 days.

iii) Cultures under MLT

1. Tomato pre release culture CBE-SL-19-14-34 (Flat Round segment) (HC&RI, Coimbatore)

It is a hybrid derivative of cross CBE-SL-47 x CBE-SL-69 which comes to flowering in 58 days. Plant stature is short (92.43cm) and registered the highest per plant yield (3.50 kg), single fruit weight (102.17g), fruit number (45.24) and quality parameters *viz.*, pericarp thickness (0.56cm), ascorbic acid (29.50mg/100g), lycopene (7.45mg /100g) and β -carotene (8.81 mg/100g).

2. Tomato hybrid SL 133 x SL 169 (HC&RI, Periyakulam)

It is a hybrid between SL133 x SL169. The hybrid yields 6.1 kg of fruits per plant with single fruit weight of 91.36 g and fruit number of 76.44. The fruit pericarp thickness is around 0.62 cm with 32.21 mg/100 g of ascorbic acid and 5.33° Brix of TSS. This hybrid found to be resistant to TLCV and root knot nematode.

3. Tomato culture H6 -48-44 – 17 – 16 (HC&RI, Periyakulam)

It is a hybrid derivative between ArkaVikas x *Solanum peruvianum* EC519809. Plants are semi determinate with plant height of 170.50 cm. Days to 50 per cent flowering was noticed 30 days after transplanting. Cluster bearing type with four fruits per cluster and number of fruits per plant found to be 73 with 65 percent fruit set. Fruit shape is oblong to round. Single fruit weight is 52 g. Fruit yield per plant is 3.80 kg and estimated fruit yield per hectare is 80 t/ha which shows resistant to PBNV.

4. Tomato culture H27-173-22 –23 -15 (HC&RI, Coimbatore)

It is a hybrid derivative between PKM1 x EC519791 *S. habrochaites*. Plants are semi determinate with plant height of 130 cm. Days to 50 per cent flowering is 40 days. Cluster bearing type with three fruits per cluster. Fruit set percent is 74. Fruits are with flat round in shape which yields 71 fruits per plant with 48 g of single fruit weight. Fruit yield per plant is 3.32 kg. Estimated fruit yield per hectare is 75 t/ha which is resistant to PBNV.

5. Brinjal culture TrySM – 3 (HC&RI (W), Trichy)

TrySM - 3 recorded purple coloured, oblong non-spiny brinjal fruits with high yield and similar to the much sought locally preferred region specific Manapparai Local brinjal with similar taste and quality characters. TrySM – 3 recorded the highest yield per plant (2.194 kg) with desirable characters like earliness in flowering, early harvest with more plant height and number of branches which influences the yield indirectly. It was found to be tolerant to shoot and fruit borer infestation with 14.3 % shoot infestation and 22.9 % fruit infestation.

6. Brinjal SM 6 (AC&RI, Vazhavachanur)

Brinjal accession SM 6 (a purple type identified from Tiruvallur Dt.) with highest per plant yield (3540.50 g per plant) followed by SM 11 (3100.50 g per plant) and SM 16

(2900.50 g per plant) (Bhavani type). These promising accessions showed moderate resistance (11-20%) against shoot and fruit bore incidence. Under field conditions, these select brinjal accessions showed resistance reaction against mosaic incidence. However, final disease reaction will be confirmed only after artificial screening for mosaic disease.

7. Mundi Chilli PKM CA-08-05-08 (Chattii Mundu type) (HC&RI, Periyakulam)

Pureline selection for *mundu* chilli genotypes collected from Virudhunagar Dist. (Kathalampatti)

Mundi Chilli PKM CA-08-05-08 (Chattii Mundu type)	
Morphological traits	Quality traits
Plant Height : 71.3 cm Mean number of fruits/ plant : 638 Fresh fruit yield /plant : 362.3 g Dry fruit yield /plant : 67.2 g	Capsaicin : 0.36 % Capsanthin : 210.7 (ASTA) Colour Value: 62.48 (ASTA) Oleoresin : 9.90 % Ascorbic acid : 160 mg/100g Dry fruit yield: 3324 kg/ha

8. Chilli-CC-CBE-003 (HC&RI, Coimbatore)

The genotype CC-CBE-003 recorded maximum number of fruits per plant (260.10), the highest fresh fruit yield per plant (621g) and the highest capsaicin content (1,70,264 SHU) which can be utilized for industrial purpose.

9. Ashgourd – BHM 9 (HC&RI, Periyakulam)

It is a selection from Mizoram type. The average vine length is 3.50m with internodal length of 7- 8 cm. Days to 50 per cent flowering is 67 days. Sex ratio is 6.85. Average fruit weight is 600 to 700 g. Length of the fruit is 15 cm and width is 40 cm. Number of fruits per vine is six. Fruit yield per vine is 6.0 kg. Estimated yield per hectare is 15 -20 t. Suitable for commercial cultivation and home garden.

10. Ashgourd – APP 2 (VRS, Palur)

APP-2 is found to produce high yield with single fruit weight of 374 g and has better taste without off flavour.

11. Sweet potato IB 73 (HC&RI, Coimbatore)

IB 73 sweet potato is a culinary type suitable for vegetable. The tubers have attractive pink skin with white flesh with good storability. It recorded 1.51 kg of tuber yield per vine with tuber weight of 209.32 g. It is suitable for planting during October – November, February-March and June -July season.

12. Tapioca YTPH 1 (TCRS, Yethapur)

The hybrid is erect, medium growing and non branching type. The tubers are long, cylindrical with pinkish white skin and white flesh. Cassava mosaic disease incidence is grade 1 (No visible symptom). Crop duration is 270-300 days. Starch by specific gravity

method is 29.5 to 31.00%. Total starch content 45.27% (chemical method). HCN content in Tuber is 390.61 ppm.

B. Action plan 2023-24

a. Crop Improvement

Theme: Development of varieties/hybrids with resistance to biotic and abiotic stress

Crop	Centre	Action plan (2023- 2024)	Deliverables
Tomato	HC&RI, Coimbatore	Conducting Crossing programme to incorporate resistance to fusarium wilt, TLCV and nematode. The donor is SL 169 for TLCV and Nematode resistance	Development of multiple disease resistant varieties /hybrids
	HC&RI, Periyakulam	Conducting MLT for the interspecific hybrid derivative H6 -48-47-17-16 (Arka vikas x <i>Solanum peruvianum</i>) resistant to peanut bud necrosis virus.	Development of interspecific hybrid derivative resistant to peanut bud necrosis virus.
Brinjal	HC &RI, CBE	Conducting large scale trial for the culture CBE SM 03-17-21 and submitting variety release proposal 2023-24.	Release of brinjal hybrid CBE SM 03-17-21
	HC &RI (W), Trichy	The identified region specific brinjal culture TRYSM-3 to be tested in MLT.	Conduct of MLT of TRYSM-3 purple with white tinged brinjal
	AC&RI, Vazhavachanur	The identified region specific brinjal culture SM 06 to be tested in MLT in different centres.	Conduct of MLT of purple type brinjal SM 06

Theme: Development of hybrids in Chilli for yield and capsaicin content

Crop	Centre	Action plan (2023- 2024)	Deliverables
Chilli	HC&RI, Coimbatore	The identified high capsaicin chilli genotype CC-CBE-003 will be test verified under large scale demonstration and to be given for MLT.	Conducting MLT of high capsaicin chilli genotype (<i>Capsicum chinense</i>) CC-CBE-003 suitable for industrial purpose.
	HC&RI, Periyakulam	Evaluation of the selected mundu chilli types PKM CA 08-05-08, PKM CA 32-9-04 and will be tested at Ramanathapuram area in farmers' field.	Performance evaluation of mundu chilli PKM CA 08-05-08 and PKM CA 32-09-04 at rainfed areas of Ramanathapuram.

Theme: Development of hybrids/varieties with high yield and quality in cucurbits

Crop	Centre	Action plan (2023- 2024)	Deliverables
Bottle gourd	HC&RI, CBE	Development of small fruited hybrids in bottle gourd (cylindrical / round type).	Performance evaluation of small fruited bottle gourd hybrids.
Ash gourd	HC&RI, PKM	Small fruited ash gourd (600g) accession BHM 9 will be tested under MLT.	Conducting MLT of identified small fruited ash gourd BHM 9.
	VRS, Palur	Small fruited salad type ash gourd (200g) will be tested in different centres.	Performance evaluation of small fruited salad ash gourd at different centres.

Bitter gourd	HC&RI, CBE	Confirmatory trial for the bitter gourd hybrid (<i>Momordica charantia</i> x <i>M. muricata</i>).	Confirmatory trial for the bitter gourd hybrid (<i>Momordica charantia</i> x <i>M. muricata</i>).
Cucumis species	HC & RI, CBE	Cultures CBE-CS-37 and CBE-CS-19 evaluated with the available salad cucumber.	Evaluation of salad <i>Cucumis</i> species under large scale demonstration

Theme: Development of hybrids/varieties in moringa for leaf, pod and oil yield and quality

Crop	Centre	Action plan (2023- 2024)	Deliverables
Moringa	HC&RI, Periyakulam	Perennial moringa PKM MO – 65 (Karumbu moringa) for variety release during 2023 – 24. Evaluation of mutants (M ₄ generation) viz., 15-01-09,35-01-62,35-01-63 and 35-01-65 for higher leaf biomass yield. The identified moringa genotypes (PKM MO 43, PKM MO 59 and PKM MO 61) for oil yield and quality to be continued.	Release of perennial moringa PKM MO – 65 during 2023-24.
	HC&RI, Coimbatore	Conducting Ratoon trial for the identified moringa hybrids.	Assessment of moringa hybrids in ratoon crop.

Theme: Screening of rootstocks for drought resistance and uniformity

Crop	Centre	Action plan (2023- 2024)	Deliverables
Moringa	HC&RI, Periyakulam	Grafting using wild species (<i>Moringa concanensis</i>) for drought tolerance.	Testing of moringa grafts for drought tolerance.
	HC&RI, Coimbatore	The identified rootstock (Moolanur moringa) grafting with PKM 1 will be tested in OFT.	Conducting OFT of identified moringa graft.

Theme: Evaluation of tapioca varieties for yield, quality and screening for disease incidence

Crop	Centre	Action plan (2023- 2024)	Deliverables
Tapioca	HC&RI (W), Trichy	Evaluation of identified accessions / varieties under Pachamalai hills for pest and diseases will be continued.	Identification of alternate varieties with pest & disease resistance for cultivation under Pachamalai hills.

Theme: Development of varieties in lab lab for high yield and year-round production

Crop	Centre	Action plan (2023- 2024)	Deliverables
Lab lab	HC&RI, Periyakulam	Evaluation of identified three lines viz., PKM DP 02, PKM DP 03 and PKM DP 22 for yield, quality and year-round production to be continued.	Performance evaluation of identified lab lab cultures.

Theme: Development of varieties with high yield and quality in Underutilized Vegetable Crops

Crop	Centre	Action plan (2023- 2024)	Deliverables
Underutilized Vegetable Crops	HC&RI, Coimbatore	Evaluation of <i>Momordica charantia</i> var. <i>muricata</i>	Evaluation of <i>M. charantia</i> var. <i>muricata</i> and metabolomics study will be performed.

	HC&RI, Periyakulam	Evaluation underutilized crops viz., Velvet bean, Yard long bean, Winged bean and <i>M. dioica</i> .	Strengthening of germplasm wealth in underutilized crops.
	AC&RI, Madurai	Evaluation of <i>Momordica cymbalaria</i> .	Performance evaluation of <i>M. cymbalaria</i> at Madurai.

b. Crop Management

Theme: Standardization of crop geometry and harvesting height for leaf yield in moringa PKM 1

Crop	Centre	Action plan (2023- 2024)	Deliverables
Moringa	HC&RI, Periyakulam	Confirmatory trial (HDP system) to be conducted for leaf production and quality	Conduct of OFT for technology release.

Theme: Mechanization in cassava

Crop	Centre	Action plan (2023- 2024)	Deliverables
Cassava	TCRS, Yethapur/ AEC&RI, Coimbatore	Designing of Cassava harvester in association with AEC&RI, Coimbatore for harvesting of Cassava	Development of Cassava harvester suitable for both vertical and horizontally tuber forming varieties.

Theme: Development of post harvest handling technology for vegetable crops

Crop	Centre	Action plan (2023- 2024)	Deliverables
Vegetable crops	HC&RI, Periyakulam	Confirmatory trial to be continued for postharvest management to enhance the shelf life and quality of Moringa and Bhendi for technology release.	Confirmatory may be conducted and forwarded for technology release.

Theme: Development of Organic package for Vegetables

Crop	Centre	Action plan (2023- 2024)	Deliverables
Moringa	HC&RI, Periyakulam	Standardization of organic package in moringa for leaf yield and quality.	Standardization of organic package for moringa leaf production.
Palak	NOFRC/ HC&RI, CBE	Standardization of bio-formulation for improving growth and yield in palak.	Standardization of bio-formulation for improving growth and yield in palak
Organic pot mixtures	NOFRC/ HC&RI, CBE	Development of organic pot mixture supplements for home gardens.	Development of organic supplement for potted vegetables for rooftop garden.

Theme: Fulvic acid based multi nutrient formulation for tomato

Crop	Centre	Action plan (2023- 2024)	Deliverables
Tomato - Multi Nutrient Formulation	DNRM, TNAU, Coimbatore	The multi nutrient formulation will be tested under OFT in comparison with the existing recommendation.	Multinutrient formulation for improving the yield and quality of tomato

Treatments

T ₁	:	Recommended NPK alone (as per STCR-IPNS)
T ₂	:	T ₁ + Foliar application of micronutrients as per CPG (ZnSO ₄ @ 0.5% at 40, 50 and 60 DAP; Boric acid @ 0.3% at flowering and 10 days later)
T ₃	:	T ₁ + Foliar spray of Multi nutrient formulation III @ 1% thrice at 30, 60 and 90 DAP

Observations to be recorded

- ✓ Yield attributes and fruit yield
- ✓ Fruit quality parameters
- ✓ Working out economics

Centres and Scientists in-charge

Coordinating Centre:

Dept. of SS&AC, TNAU, Coimbatore - Dr. P. Malathi, Associate Professor (SS&AC)

Participating Centres:

TNAU, Coimbatore (Coimbatore Dt. 8 Nos.) - Dr. P. Malathi, Associate Professor (SS&AC)

TNAU, Coimbatore (Dindigul Dt. 7 Nos.) - Dr. K.M. Sellamuthu, Professor (SS&AC)

RRS, Paiyur (Krishnagiri Dt. 5 Nos.) - Dr. M. Sangeetha, Associate Professor (SS&AC)

Theme: Evaluation of leafy vegetable under vertical farming structure

Crop	Centre	Action plan (2023- 2024)	Deliverables
Vertical farming structures	HC & RI, CBE / PKM / TRY	Evaluation of leafy vegetables to be continued under vertical farming structures.	Standardizing the suitability of leafy vegetables under vertical farming

C. Remarks on University Research Projects

a. Crop improvement

S. No.	Project Number, Title and Period	Project Investigator and Centre	Remarks
I. CROP IMPROVEMENT			
TOMATO			
1.	HCRI/CBE/HOR/VEG/2020/002 Developing breeding line with ty-5 gene for ToLCV resistance by back cross breeding in tomato Period: May 2020 to April 2023	Dr. T. Saraswathi Professor (Hort.)	Project may be closed and completion report may be submitted.
BRINJAL			
2.	HCRI/TRY/HOR/VEG/2020/001 Development of region specific brinjal variety/hybrid for yield and quality traits Period: January 2020 to December 2022	Dr. A. Nithya Devi Asst. Prof. (Horticulture)	Project may be closed and completion report may be submitted.
3.	HCRI/PLR/HOR/VEG/2020/001 Development of cluster bearing brinjal types for yield and quality specific to North-Eastern zone Period: May 2020 to February 2023	Dr. M. S. Aneesa Rani Nodal officer, HC&RI, Jeenur	Project may be closed and completion report may be submitted.

4.	HC&RI/VVNR/HOR/VEG/2019/001 Improvement of locally preferred brinjal types for North Eastern Zone of Tamil Nadu Period: November, 2022 to October,2024	Dr. M. Kavino Assoc. Prof. & Head	The project may be continued
5.	HORT/KKM/HOR/HOR/2022/001 Development of F ₁ hybrid in white Brinjal suitable for southern districts of Tamil Nadu Period: April 2023 to December 2025	Dr. M.I. Manivannan Asst. Prof. (Hort.)	The project may be continued
CHILLI			
6.	HORT/CBE/VEG/HOR/2023/002 Performance assessment and selection of mundu chilli (<i>Capsicum annuum</i>) genotypes with high yield and quality Period: November 2022 -October 2025	Dr. S. Praneetha, Prof. (Hort)	The project may be continued
7.	HCRI/PKM/HOR/VEG/2019/001 Purification of Mundu chilli (<i>Capsicum annuum L.</i>) genotypes and evaluation for high yield and suitable for rainfed conditions Period: September 2022 to August 2023	Dr. K. Nageswari, Professor (Hort.)	The project may be continued.
8.	HCRI/CBE/HOR/VEG/2021/001 Development of chilli (<i>Capsicum chinense</i> Jacq.) genotype with high yield and capsaicin for industrial purpose. Period: November 2020 to December 2023	Dr. H. Usha Nandhini Devi Assoc. Prof. (Hort.)	The project may be continued
9.	HORT/CBE/VEG/HOR/2022/001 Development of F ₁ hybrids in chilli for high capsaicin content through interspecific hybridisation Period: March 2022-February 2024	Dr. H. Usha Nandhini Devi Assoc. Prof. (Hort.)	The project may be continued
OKRA			
10.	HCRI/CBE/HOR/VEG/2019/001 Development of high yielding F ₁ hybrids with yellow vein mosaic (YVMV) and enation leaf curl virus resistance (ELCV) in bhendi (<i>Abelmoschus esculentus</i>) Period: January 2019 – August 2024	Dr. H. Usha Nandhini Devi Assoc. Prof. (Hort.)	The project may be continued
11.	HORT/CBE/VEG/HOR/2023/001 Comparative performance of Okra hybrids for resistance to YVMV and ELCV Period: January 2023 to December 2024	Dr. M. Kavitha Assoc. Prof. (Hort.)	The project may be continued
ASH GOURD			
12.	HCRI/PAC/HOR/VEG/2022/NEW Collection and evaluation of ash gourd (<i>Benincasa hispida</i>) germplasm for identification of small fruited salad type for urban families. Period: Dec 2022 to Dec 2025	Dr. M.S. Aneesa Rani Nodal officer	The project may be continued.
BITTER GOURD			
13.	HCRI/TRY/HOR/VEG/2019/001 Development of F ₁ hybrid / variety in bitter gourd (<i>Momordica charantia</i> L. Moench) for high yield and quality Period: October 2019 to September 2022	Dr. K.R. Vijayalatha Assoc. Prof. (Horticulture)	Project may be closed and completion report may be submitted.
14.	HCRI/CBE/HOR/VEG/2021/002 Trait specific genetic enhancement through interspecific hybridization in <i>Momordica</i> (bitter gourd) Period: July 2021 to June 2023	Dr. V. Rajasree, Prof. (Hort.)	Project may be closed and completion report may be submitted.

BOTTLE GOURD			
15.	HCRI/CBE/HOR/VEG/2021/002 Development of cylindrical small fruited F ₁ hybrids in bottle gourd for Tamil Nadu conditions Period: July 2021 – June 2023	Dr. M. Kavitha Assoc. Prof. (Hort.)	Project may be continued till 2024. Extension proposal may be submitted for continuation
CUCUMBER			
16.	HC&RI/CBE/HOR/VEG/2020/001 Development of salad varieties in <i>Cucumis sps</i> (Cucumber and Snap melon). Period: March 2020 to April 2023	Dr. H. Usha Nandhini Devi Assoc. Prof. (Hort.)	Project may be closed and completion report may be submitted
CHOW-CHOW			
17.	CPMB/CBE/BIT/VEG/2021/001 Meristem tip culture for the production of disease-free quality planting materials in Chow-Chow (<i>Sechium edule</i>). Period: Dec. 2020 to Nov. 2022	Dr. N. Manikanda Boopathi Prof. (Biotechnology), DPB	Project may be closed and completion report may be submitted
GARDEN BEAN			
18.	HCRI / VGD/HOR / VEG / 2019 /001 Development of high yielding, short duration, bush type vegetable garden bean (<i>Lablab purpureus</i> var. <i>typicus</i>). Period: April 2019 – November 2022	Dr. T.L. Preethi Assistant Professor (Hort)	Project may be closed and completion report may be submitted
COWPEA			
19.	HCRI/KVK/VRI/HOR/VEG/2021/001 Evaluation of vegetable cowpea (<i>Vigna unguiculata</i> (L). Walp. Varieties suitable to Cuddalore District Period: June 2021-May 2024	Dr. K. Sundharaiya Assistant Professor (Hort.)	The project may be continued
20.	HORT/JEE/HOR/2023/002 Developing Bush type Vegetable cowpea (<i>Vigna unguiculata</i> L. Walp) through mutation.	Dr. A. Sankari Professor (Hort.)	The project may be continued.
TAPIOCA			
21.	HOR//TRY/HOR/VEG/2022/001 Evaluation and identification of suitable high starch tapioca varieties for Pachamalai hills of Trichy district. Period: April 2022- March 2024	Dr. T. Thangaselvabai Professor & Head Dr. Sheeba, Assoc. Prof. (Agrl. Ento), HC&RI (W), Trichy	The project may be continued
MORINGA			
22.	HCRI/CBE/HOR/VEG/2021/001 Evaluation of intervarietal hybrids of <i>Moringa oleifera</i> for yield and quality Period: August 2021 - November 2024	Dr. T. Saraswathi Professor (Hort.)	The project may be continued
UNDER UTILISED VEGETABLES			
23.	HCRI/MDU/HOR/VEG/2019/001 Collection, evaluation and characterization of underutilized vegetables like spine gourd (<i>Momordica dioica</i>) and athalakkai (<i>Momordica cymbalaria</i>) for growth and yield characters Period: August 2019 – July 2022	Dr. Arul Arasu, Asst. Prof. (Hort.)	Project may be closed and completion report may be submitted

b. Crop Management

S. No.	Project Number, Title and Period	Project Investigator and Centre	Status
TOMATO			
1.	NRM/PKM/SAC/VEG/2020/001 Development and evaluation of fulvic acid based multi nutrient formulation for tomato Period: January 2020 to December 2022	Dr. P. Malathi Asst. Prof. (SS&AC)	Project may be closed and completion report may be submitted
2.	DNRM/CBE/AGM/2021/001 Effect of <i>Paenibacillus</i> inoculation for salt stress alleviation and improved growth and yield of Tomato grown under saline conditions Period: January 2021 to March 2023	Dr. R. Poorniammal Asst. Prof. (Agrl. Microbiology)	Project may be closed and completion report may be submitted
BRINJAL			
3.	NRM/TRY/FRU.SCI/HOR/2021/002 Development of Customized Fertilizer Formulations for Brinjal (<i>Solanum melongena</i> L.) under Sodic soils. Period: January 2022 to January 2024	Dr. T. Sherene Jenita Rajammal, Assoc. Prof. (SS&AC)	The project may be continued
CHILLI			
4.	HCRI/PAL/SST/GNT/2021/001 Enhancement of seed yield and quality in chilli PLR 1. Period: December 2020 –December 2022	Dr. V. Vijaya Geetha Asst. Prof. (SS&AC)	Project may be closed and completion report may be submitted
BHENDI			
5.	SEC/TRY/SST/VEG/2020/001 Development of seed priming technique for better field emergence and productivity in bhendi under saline / sodic soil condition Period: August 2020 to July 2023	Dr. A. Sabir Ahamed Professor (SST)	Project may be closed and completion report may be submitted
ONION			
6.	CPMB/SSAC/TRY/NON/2021/001 Study on volatile organic compounds in postharvest storage of <i>Allium cepa</i> .var. <i>aggregatum</i> . Period: March 2021 to February 2023	Dr. S. Geethanjali Asst. Prof. (Biochemistry)	Project may be closed and completion report may be submitted
7.	SEC/CBE/SST/HOR/2022/001 Standardization of seed priming and pelleting technique to improve seed germination and seedling vigour in onion. Period: March 2022 to Feb. 2024	Dr. D. Thirusendura Selvi, Asst. Prof. (SST)	The project may be continued
8.	DCM/TRY/VS/HOR/2022/001 Physiological evaluation of small onion for increasing yield through growth regulators and nutrient mixture Period: August 2022 to July 2024	Dr. R. Amutha, Professor & Head	The project may be continued
ATHALAKKAI			
9.	HORT/ PKM/ PSTC/ N O N/20 23/001 Standardization of postharvest treatments and value addition techniques to extend the shelf life of Athalakkai (<i>Momordica cymbalaria</i>) Period: January 2023 to December 2025	Dr. A. Beulah, Prof. (Horti.)	The project may be continued

CLUSTER BEAN			
10.	HCRI/MTP/HOR/VEG/2019/001 Evaluation of Vegetable Cluster bean genotypes under <i>Melia dubia</i> based ecosystems Period: October 2019 to September 2022	Dr. P. Hemalatha Assistant Professor (Hort.)	Project may be closed and completion report may be submitted
TAPIOCA			
11.	DCM/YTP/AGR/HOR/2021/001 Effect of Weed Management practices on growth and yield in Tapioca. Period: November 2020 to October 2023	Dr. S. K. Natarajan Assoc. Prof. (Agron.)	The project may be continued
12.	HOR/YTP/HOR/2023/001 Cassava based intercropping system for maximum profitability under irrigated ecosystem Period: January, 2023 to December, 2024	Dr. M. Velmurugan Assoc. Prof. (Horticulture)	The project may be continued
ELEPHANT FOOT YAM			
13.	HCRI/CBE/HOR/VEG/2020/004 Evaluation of smaller mini corms in elephant foot yam (<i>Amorphophallus paeoniifolius</i>) under closer spacing systems. Period: Oct. 2020 to Sept. 2022	Dr. C. Thangamani Assistant Professor (Hort.)	Project may be closed and completion report may be submitted
MORINGA			
14.	HCRI/CBE/HOR/VEG/2019/003 Screening of rootstocks for drought tolerance and uniformity in Moringa (<i>Moringa oleifera</i>) Period: July 2019 – March 2022	Dr. T. Sumathi Assistant Professor (Horticulture)	Project may be closed and completion report may be submitted
15.	HCRI/DCM/PKM/AGR/2021/001 Optimising crop geometry and harvesting heights in Moringa (<i>Moringa oleifera</i>) for leaf production Period: January 2021 to December 2022	Dr. M.P. Kavitha Assistant Professor (Agronomy)	Project may be closed and completion report may be submitted
16.	HC&RI/PKM/HOR/VEG/2019/002 Effect of dehydration on the nutritive value of <i>Moringa oleifera</i> leaves. Period: Oct. 2019 to Sep. 2022	Dr. T. Anitha Asst. Prof. (Bio Chemistry)	Project may be closed and completion report may be submitted
17.	SEC/PKM/VEG/HOR/2022/001 Assessment of seed invigouration technique for enhancing vigour status of annual moringa PKM1 Period: July 2022 to June 2025	Dr. P. Geetharani Professor (SS&T)	The project may be continued
AMARANTHUS			
1.	HORT/TIR/HOR/2023/001 Efficacy of organic cultivation in <i>Amaranthus tristis</i> at Tiruvallur Dt. Period: Nov. 2022 to Dec. 2024	Dr. A. Punitha, Asst. Prof. (Hort.)	The project may be continued
MICRO GREENS			
2.	SEC/MDU/SST/HOR/2022/001 Standardization of pre sowing seed treatment to improve biomass yield and quality of micro greens/ baby greens. Period: April 2022 to March 2024	Dr. R. Geetha Professor (SST)	The project may be continued
TEMPERATE VEGETABLE CROPS			
3.	HCRI/OTY/HOR/VEG/2021/003 Standardization of crop specific organic farming package of practices for Beetroot, Radish and French Beans (Busy type). Period: April 2021 to March 2023	Dr. D. Keisar Lourdusamy, Professor (Hort.)	Project may be closed and completion report may be submitted
4.	HCRI/OTY/HOR/VEG/2021/001	Dr. P. Raja	Project may be closed and completion

	Standardization of crop specific organic farming package of practices for selected temperate vegetable crops. Period: Jan. 2021 to Dec. 2022	Assoc. Prof. (Ag. Micro)	report may be submitted
5.	HCRI/OTY/HOR/VEG/2021/002 Standardization of crop specific farming package of practices for exotic vegetable crops – broccoli, lettuce and pokchoi. Period: June 2021 to Oct. 2022	Dr. S. P. Thamaraiselvi Assoc. Prof. (Hort.) & Head (I/c)	Project may be closed and completion report may be submitted
FRESH AND CUT VEGETABLES			
6.	AC&RI/MDU/AGM/HOR/2022/001 Improving the quality and shelf life of fresh and cut vegetables using a cocktail of bioprotective lactic acid bacterial metabolites Period: August 2022 to July 2024	Dr. R. Subhashini Assoc. Prof. (Agr. Microbiology)	The project may be continued
GREEN LEAFY VEGETABLES			
7.	DCM/CBE/NOFRC/HOR/2023/001 Standardization of bioformulation for improving growth and yield in greens Period: January 2023 to March 2024	Dr. P.S. Kavitha, Assoc. Prof. (Hort)	The project may be continued
8.	DCM/CBE/NOFRC/HOR/2023/002 Development of organic pot mixture supplements for home gardens. Period: Jan. 2023 to March 2024	Dr. P.S. Kavitha, Assoc. Prof. (Hort)	The project may be continued

III. SPICES AND PLANTATION CROPS

A. Cultures under MLT/ART/OFT

i). Varieties and Technologies identified for release (2024)

1. Tamarind (Ti-31)

Special Features

Selection from germplasm (IC-0642288) collected from Erumanayakanpatti village near Periyakulam. Early bearer, pods are bold and lengthy, red fleshy and tasty. High pod weight (36.33 g) and pod yield (217.85 kg/tree). Pulp contains high antioxidant (1614 µg/g), anthocyanin (248.00 mg/g) and low content of tartaric acid (14.50%). Suitable for preparation of RTS, jam, jelly, chutney, pulp powder and fruit bar. The data has been collected for the past 10 years.

2. Coconut – ACC. No. CRP 717 – IC No. 599264(NBPGR) (CRS, Veppankulam)

Yield status from 67th month: Average yield 121 - 166 Nuts/Palm/ year, Potential yield 252 nuts/palm/year, Copra content 137 gm and Oil content 67.94%

3. Technologies for release - Evaluation of micronutrient mixture for cocoa under coconut intercropping system (CRS, Aliyarnagar)

At present there is no holistic micronutrient recommendation for cocoa at national level. Micronutrient recommendation for cocoa has been standardized as FeSO₄ – 100 g, MnSO₄ – 25 g, ZnSO₄ – 50 g, CuSO₄ – 25 g and Borax – 10 g per plant per year. It has scope for adoption in Cocoa growing districts of Tamil Nadu. In some districts, in sporadic patches cocoa is intercropped in coconut. Totally the technology can benefit 20,000 ha of cocoa area in Tamil Nadu.

(ii) Cultures – Under MLT / ART

1. Turmeric - CL 258 & CL 95 (HC&RI, Coimbatore)

Salient features

Genotypes	Fresh rhizome yield (g/plant)	Dry recovery (%)	Dry rhizome yield (g/plant)	Estimated yield (t/ha)	Curcumin content (%)	Total curcumin yield (kg/tonne)
CL 258	341.25	20.92	71.38	40.84	5.09	41.74
CL 95	381.78	21.42	81.77	47.00	4.66	46.59

Genotypes	Demethoxy curcumin	Bisdemethoxy curcumin	TCC (HPTLC)	Curcumin oleoresin (%) *	ASTA Curcumin (%) *
CL 258	1.24	0.89	4.23	35.70	3.37
CL 95	0.95	0.83	3.38	33.07	3.60

- The seed rhizomes of CL 258 and CL 95 will be sent to different centres for MLT during 2023-2024
- The check varieties are BSR 3, Alleppey Supreme and Lakhadong

2. Nutmeg -MF 4 (HRS, Pechiparai)

In Nutmeg, among the 24 accessions, MF-4 recorded maximum number of fruits (685.40 fruits /tree) and the single fruit weight was also highest in MF-4 (53.55 g) and mace yield recorded per tree was 288.89 g/tree. Local check recorded 499 fruits /tree, single fruit weight of 50.3 g and mace yield of 163.22 /tree. This accession has been sent for MLT.

B. Action plan 2023-24

a). CROP IMPROVEMENT			
Crop: Turmeric			
Theme No 1: Evaluation of varieties in spices for high yield and quality			
Sub Theme I: Evaluation of varieties of turmeric for high yield and high curcumin content through selection			
Activity	Name of the centre	Action Plan	Deliverables
Evaluation of turmeric genotypes	HC& RI, Coimbatore	Evaluation of turmeric for high curcumin content in different locations to study the influence of environment. Available genotypes will be collected from ARS, Bhavanisagar.	Identification of a high yielding variety with high curcumin content and standardization of harvesting time for quality parameters
	HC& RI, Coimbatore ARS, Bhavanisagar	The identified promising cultures viz., CL 258 and CL 95 with high yield and curcumin content will be sent for MLT with BSR 3, Alleppey Supreme and Lakhadong as check varieties	
		Harvesting time for high curcumin, essential oil and oleoresin content will be standardized	
Crop: Ginger			
Theme No 1: Evaluation of varieties in spices for high yield and quality			
Sub Theme II: Evaluation of ginger varieties for high yield, quality and tolerance to soft rot through selection			
Activity	Name of the Centre	Action Plan	Deliverables
Evaluation of high yielding ginger genotype	HRS, Ooty HC&RI, Coimbatore	Evaluation of ginger genotypes may be done	Identification of high yielding ginger variety suitable for open cultivation in Nilgiris
	HRS, Ooty	Large scale trials will be continued in more number of farmers holdings to evaluate the performance of the ginger genotypes GA 578 and Mahima. The best performing genotypes GA 578 (for yield and tolerance to soft rot) will be multiplied for large scale testing.	
Crop: Black pepper			
Theme No 1: Evaluation of varieties in spices for high yield and quality			
Sub Theme III: Evaluation of black pepper accessions/ varieties for high yield and quality			
Activity	Name of the Centre	Action Plan	Deliverables
Identification of high yielding black pepper variety suitable for	HRS, Yercaud HRS, Thadiyankudisai HRS, Pechiparai	The high yielding and wilt tolerance varieties such as Panniyur 8, Panniyur 9, IISR - Shakthi and IISR – Thevam will be tested under subtropical conditions. Newly released varieties will also be collected from IISR, Calicut.	Identification of an alternative high yielding black pepper variety for subtropical conditions

pepper growing regions of Tamil Nadu			
Identification of resistant root stocks	HRS, Yercaud	Collection of quick wilt and slow wilt resistant root stocks in black pepper will be carried out with a separate URP	Quick wilt and slow wilt resistant root stocks in black pepper will be identified

Crop: Curry leaf			
Theme No 1: Development of varieties in spices for high yield and quality			
Sub Theme IV: Evaluation of curry leaf varieties for yield and quality			
Activity	Name of the Centre	Action Plan	Deliverables
Development of curry leaf varieties	HC&RI, Coimbatore	Evaluation for the selection of superior genotype (Acc. 13, 11 and 9) for fresh leaf and quality.	High yielding with high essential oil content of Curry leaf genotype will be identified
Crop: Nutmeg			
Theme No 1: Development of varieties in spices for high yield and quality			
Sub Theme V: Development of varieties for high yield and quality in nutmeg			
Activity	Name of the Centre	Action Plan	Deliverables
Development of varieties for high yield and quality in nutmeg	HRS, Pechiparai, CRS, Aliyarnagar	The promising culture MF 4 will be multiplied for conducting MLT.	Identification of high yielding Nutmeg variety
Crop: Coconut			
Theme No 2: Development of varieties in plantation crops for high yield and quality			
Sub Theme I: Evaluation of existing germplasm and selection of superior genotypes for varieties / hybrids with high yield and quality in coconut			
Activity	Name of the Centre	Action Plan	Deliverables
Development of DxT, TxD and DxD hybrids, varieties in coconut for high quality tender nut, copra, virgin oil and other qualities	CRS, Veppankulam and CRS, Aliyarnagar	Evaluation of existing hybrids of D x T, T x D and D x D for high quality tender nut, copra content to be continued.	Development of varieties, hybrids in coconut for high quality tender nut, copra, etc.
	CRS, Veppankulam	Assessment of coconut varieties / hybrids suitable for yield, higher tender nut water powder (TNWP), virgin coconut oil recovery, etc., and identification of potential probiotics from coconut milk waste will be studied. <i>Inter-se</i> variety and hybrid seedling production in Coconut will be carried out.	Development of coconut varieties / hybrids for yield and quality. Production of elite coconut seedlings.

b). CROP MANAGEMENT

Crop: Bush pepper

Theme No 1: Standardization of improved agro techniques for increasing the productivity of spices

Sub Theme I: Enhancement of population density and improving the productivity of bush pepper under shade net

Activity	Name of the Centre	Action Plan	Deliverables
Standardization of Bush Pepper under shadenet	HRS, Pechiparai	Bush pepper under open condition under forest eco system and shade net condition (50 %) for yield and quality will be proposed for OFT for technology release. Shade net cultivation of bush pepper will be promoted in roof top garden.	Bush Pepper cultivation under shade net and promotion of roof top gardening
Crop: Turmeric			
Theme No 1: Standardization of improved agro techniques for increasing the productivity of spices			
Sub Theme II: Yield enhancement in turmeric by microbial consortia			
Activity	Name of the Centre	Action Plan	Deliverables
Standardization of microbial consortia application in turmeric	HC&RI, Coimbatore	Standardization of microbial consortia in turmeric for yield and quality will be continued.	Standardization of microbial consortia and reducing the inorganic fertilizers.
Crop: Curry leaf			
Theme No 1: Standardization of improved agro techniques for increasing the productivity of spices			
Sub Theme III: Application of stimulants to overcome physiological disorder during off season and INM in curry leaf			
Activity	Name of the Centre	Action Plan	Deliverables
Standardization of Nutrients and application of stimulants to overcome physiological disorder during off season	HC&RI, Coimbatore	Studies on integrated nutrient management and application of stimulants to overcome physiological disorder during off season will be taken up	Physiological disorder during off season will be minimized. Integrated nutrient management package will be developed
Crop: Clove			
Theme No 1: Standardization of improved agro techniques for increasing the productivity of spices			
Sub Theme IV: Space utilization in clove through High density planting			
Activity	Name of the Centre	Action Plan	Deliverables
Standardization of HDP in clove	HRS, Pechiparai	Clove under HDP system will be evaluated for yield stability	Optimum spacing for clove under HDP will be standardized.
Crop: Coconut			
Theme No 2: Standardization of improved agro techniques for increasing the productivity of Plantation crops			
Sub Theme V: Standardization of Fertigation Scheduling for Coconut (Tall, Dwarf and Hybrid)			
Activity	Name of the Centre	Action Plan	Deliverables
Standardization of fertilizer application and fertigation scheduling.	CRS, Aliyarnagar CRS, Veppankulam HC&RI, Coimbatore	Conducting complete study including optimization of fertilizer and fertigation in coconut (dwarf, tall, hybrid), mode and frequency of delivery will be continued.	Fertilizer application and fertigation schedule will be standardized for coconut

Studying the soil nutrient status under coconut intercropping system	CRS, Aliyar Nagar	Soil nutrient status under coconut intercropping system and the effect of intercrops on coconut will be studied	Profitable coconut intercropping system can be developed without deterioration of soil health besides studying its effect on coconut
Theme No 2: Standardization of improved agro techniques for increasing the productivity of Plantation crops			
Sub Theme VI: Standardization of protocol for tissue culture seedling production in coconut			
Activity	Name of the Centre	Action Plan	Deliverables
Production of quality seedlings of coconut through <i>in vitro</i> culture techniques	AC&RI, Madurai CPMB & B, CBE	Quality seedlings will be produced through <i>in vitro</i> culture techniques for all varieties (Tall, dwarf and hybrid)	Suitable protocol will be developed for tissue culture seedling production in coconut
Crop: Palmyrah			
Theme No 3: Standardization of harvesting time			
Sub Theme I: Standardization of harvesting time of haustorium in palmyrah for bio active compounds			
Activity	Name of the Centre	Action Plan	Deliverables
Standardization of harvesting time of haustorium for nutraceuticals	HC&RI, Coimbatore	Identification of compounds having nutraceutical value in haustorium will be done.	Deriving health benefits compounds in haustorium.
Theme No 4: Standardization of improved agro techniques for increasing the productivity of Plantation crops			
Sub Theme I: Standardization of containers and media for palmyrah seedling production			
Activity	Name of the Centre	Action Plan	Deliverables
Standardization of containers and media for seedling production	AC&RI, Killikulam	Standardized nursery technology (Containers and media) will be validated.	Suitable containers and media will be standardized for elite seedling production

C. Remarks on the University Research Projects

S. No.	Project No. & title and period	Name of the scientist	Remarks
CROP IMPROVEMENT			
1.	HCRI / TKD / HOR / SPC / 2019 / 001 Collection and evaluation of black pepper (<i>Piper nigrum</i> L.) genotypes for yield and quality under the lower Pulney conditions. (January 2019 to December 2024)	Dr. R. Balakumbahan, Assoc. Prof. & Head	▪ The project may be continued

2.	HCRI/ALR/HOR/SPC/2019/002. Performance Evaluation of turmeric genotypes under Coconut ecosystem (October 2019 to September 2022)	Dr. V. Sivakumar, Assoc. Prof. (Hort.)	▪ The project may be completed and completion report may be submitted
3.	HOR/VPK/HOR/2023/002 Assessment of coconut varieties / hybrids suitable for higher tender nut water powder (TNWP) yield and quality (November 2022 to March 2025)	Dr. R. Arun Kumar, Assoc. Prof. (Hort.) Dr. M. Anand, Assoc. Prof. (Hort.) Dr. K. Gurursamy, Asst. Prof. Biochem. Dr. Veeranan ArunGiridhari V Assoc. Prof. (FSN) Dr. R. Babu, Prof. (Agronomy)	▪ The project may be continued
4.	HOR/VPK/HOR/2023/003 Assessment of coconut varieties / hybrids suitable for higher Virgin coconut oil yield recovery and identification of potential probiotics from coconut milk waste. (November 2022 to March 2025)	Dr. R. Arun Kumar, Assoc. Prof. (Hort.) Dr. G. Amuthaselvi, Asst. Prof (FPE) Dr. J. Ejilane, Asst. Prof (Ag. Micro) Dr. R. Babu, Prof. (Agronomy)	▪ The project may be continued
5.	HOR/VPK/HOR/2023/001 <i>Inter-se</i> variety and hybrid seedling production in Coconut (November 2022 to March 2025)	Dr. R. Arun Kumar, Assoc. Prof. (Hort.) Dr. R. Babu, Professor (Agronomy)	▪ The project may be continued
CROP MANAGEMENT			
6.	HCRI/CBE/HOR/SPC/2020/001 Effect of microbial consortia on crop growth, rhizome yield and curcumin content of Turmeric (<i>Curcuma longa</i> L.) October 2020 to September 2023	Dr. K. Venkatesan, Professor and Head	▪ The project may be completed and completion report may be submitted
7.	HCRI/CBE/HOR/SPC/2019/004 Evaluation of combined effect of micro nutrients and fungicides to control leaf spot in curry leaf (<i>Murraya koenigi</i> Spreng) (December 2019 to May 2022)	Dr. S. Velmurugan, Professor (Hort.)	▪ The project may be completed and completion report may be submitted
8.	HCRI/PKM/HOR/SPC/2021/001 Effect of organic inputs on herbage yield and quality in Mint (<i>Mentha arvensis</i>) and Fenugreek (<i>Trigonella foenum graecum</i>) (July 2020 to June 2022)	Dr. R. Chitra, Associate Professor (Hort.)	▪ Completion report was submitted and waiting for approval
9.	HCRI/PPI/HOR/SPC/2020/001- Assessment of yield in high density planting of clove. (February 2022 to January 2025)	Dr. A. Jaya Jasmine, Professor and Head	▪ The project may be continued
10.	HCRI/CBE/HOR/SPC/2019/002- Effect of fertigation on growth, yield and productivity of tall varieties of coconut (June 2019 to September 2024)	Dr. K. Venkatesan, Professor and Head	▪ The project may be continued
11.	HCRI/ALR/HOR/SPC/2019/002- Nutrient (N-P-K) Optimization for Dwarf Varieties of Coconut (June 2019 to September 2022)	Dr. C. Sudhalakshmi, Assoc. Prof. (SS&AC)	▪ The project may be completed and completion report may be submitted

12.	DCM/VPM/AGR/SPC/2018/001 Studies on nutrient (N&K) requirement and method of application to ECT coconut nursery (June 2019 to May 2022)	Dr. R. Babu, Professor (Agronomy)	<ul style="list-style-type: none"> ▪ The project may be completed and completion report may be submitted
13.	HC&RI/VPM/AGR/SPC/2019/001 Studies on performance of popular varieties of banana as intercrop in coconut ecosystem (June 2019 to May 2022)	Dr. R. Babu, Professor (Agronomy)	<ul style="list-style-type: none"> ▪ The project may be completed and completion report may be submitted
14.	HORT/CBE/SPI/HOR/2022/001 - Optimizing harvesting time of Palmyrah (<i>Borassus flabelifer</i> L.) haustorium with respect to bioactive compounds. (March 2022 to July 2023)	Dr. G.V. Rajalingam, Prof. (Hort.) Dr. P. Irene Vethamoni, Dean (Hort.)	<ul style="list-style-type: none"> ▪ The project may be continued. Nutraceutical properties may be studied

EXTERNALLY FUNDED SCHEMES

S. No.	Project No. & title and period	Name of the scientist	Remarks
1.	Ensuring Supply of Uniform and Quality Planting Material in Coconut Through Micro propagation (September 2018 to March 2022)	Dr. P. Meenakshisundaram, Asst. Prof. (Biotechnology), DPB, CPMB&B, Coimbatore	<ul style="list-style-type: none"> ▪ The work may be continued for all coconut varieties (tall, dwarf and hybrid) ▪ Genetic fidelity study may be undertaken in coconut
2.	CDB/CPMB/MDU/DPB/2021/R001 Production of quality seedlings of coconut through <i>in vitro</i> culture techniques (July 2021 to 2024)	Dr. R. Renuka, Prof. (Biotech.) DPBG, AC&RI, Madurai Dr. J. Suresh, Prof. & Head, CRS, Aliyarnagar Dr. K. Venkatesan, Prof. & Head, DS&PC	<ul style="list-style-type: none"> ▪ The work may be continued for all coconut varieties (tall, dwarf and hybrid) ▪ Genetic fidelity study may be undertaken in coconut.
3.	GOI/ACRI/KKM/HOR/2022/R001- Innovative Research and Development Components in Palmyrah for the Up liftment of Marginal Farmers in Tamil Nadu (April 2022 to December 2023)	Dr. N. Richard Kennady, Prof. (Horticulture) Dr. M.I. Manivannan, Assoc. Prof. (Hort.),	<ul style="list-style-type: none"> ▪ In palmyrah, the age for selling the seedlings in containers may be standardized

iv. FLORICULTURE AND LANDSCAPE ARCHITECTURE

Cultures under MLT/ART/ OFT

(i) Varieties and Technologies identified for release (2024)

1. *Jasminum sambac* Acc. Js-36 (HC & RI, Coimbatore)

Higher number of 9-budded cymes per plant. Bold flower buds; long corolla tube (1.16 cm). Fragrance scoring and consumer preference scoring on par with Ramanathapuram *Gundumalli*. Concrete recovery of 0.19% (Ramanathapuram *Gundumalli*: 0.17%). Good market preference. Ploidy level: Pentaploid ($2n=5x=65$) (Ramanathapuram *Gundumalli* is a triploid [$2n=3x=39$]). Yield (for 5-year-old plants): 10.13 t/ha/yr (compared to 7.62 t/ha/yr in Ramanathapuram *Gundumalli*). Moderately tolerant to blossom midge and bud worm under field condition. Potential substitute for Ramanathapuram *Gundumalli*.

1. Technology for delayed flower bud opening in Nerium

Recommendation: Water spray (fogging) 15 min. for every one hour. The flower buds can be harvested up to 7.40 A.M. in the morning or between 5.00 to 7.00 P.M. in the previous day evening, which facilitates easy harvesting by farmers without any drudgery in harvesting operations *i.e.* harvest during mid-night conditions.

- Flower yield:
 - Water spray (fog) 15 min. for every one hour: 230.80 g/plant
 - Control (Farmers' practice) : 168.00 g/plant
- BC ratio:
 - Water spray (fog) 15 min. for every one hour: 2.83
 - Control (Farmers' practice) : 1.92

ii. Culture under MLT /ART/OFT

a. Crop Improvement

1. White Pitchi Mutant WPM-25 (HC & RI, Coimbatore)

Higher flower bud yield: estimated yield of 4.71 t/ha against 2.10 t/ha in Local White Pitchi. Longer flower bud: 4.10 cm against 3.60 cm in Local White Pitchi. Higher concrete recovery: 0.35% against 0.32% in Local White Pitchi

2. Pink Pitchi Mutant PPM-12

Higher flower bud yield of estimated yield of 5.50 t/ha against 3.38 t/ha in CO 1 Pitchi. Longer flower bud of 4.70 cm against 4.30 cm in CO 1 Pitchi. Higher concrete recovery: 0.35% against 0.34% in CO 1 Pitchi.

3. Nerium culture NI-15

Prolific bearer with high yield (3.87 kg/ plant/year) as against 3.11 kg/plant/year in local type. 24.51 % higher yield over the local type. Single type, pink, attractive flowers. Early flowering. Hardy and moderately resistant to leaf caterpillar (11.12%).

b. Crop Management

1. Foliar nutrition for Jasmine (RRS, Paiyur)

Foliar application in *Jasminum sambac* variety Ramanathapuram *Gundumalli* with MgSO₄ (0.3%) + FeSO₄ (0.5%) + K₂SO₄ (0.5%) + Borax (0.3%) recorded the highest estimated yield of 6.75t ha⁻¹ with a yield increment of 27.6% over the control (5.29 t ha⁻¹) and a BC ratio of 3.29.

A. ACTION PLAN FOR 2023-24

a. Crop Improvement

Theme: Breeding for development of improved varieties of flower crops			
Crop	Centre	Action Plan (2023-24)	Deliverable
Jasmine	HC&RI, Coimbatore	Evaluation for promising double flower type of <i>Jasminum sambac</i> for flower yield, quality, consumer and market preferences	A novel double type of <i>J. sambac</i> will be available for commercial cultivation.
Nerium	FRS, Thovalai	The identified culture NI-15 for flower yield, quality, consumer and market preferences to be released as a variety during 2023-24.	A new promising variety of Nerium will be available for commercial cultivation by farmers.
Crossandra	HC&RI, Periyakulam	Promising genotypes CI-3 (Nilakottai orange) & CI-1 (Periyakulam yellow) genotypes will be evaluated for flower yield, quality, nematode reaction, consumer and market preferences.	Novel types of Crossandra will be evolved for commercial cultivation.
Celosia	FRS, Thovalai	Collection and evaluation of genotypes for flower yield, quality and flood tolerance will be continued.	Flood tolerant types of <i>Celosias</i> will be identified.
Orchids		Collection and evaluation of traditional orchids will be carried out.	Will pave way for conservation of traditional orchids and identification of ideal types for commercial cultivation.
Tabernaemontana (Nanthiyavattai)	HC&RI, Coimbatore	Collection and evaluation of genotypes for flower yield, quality, consumer and market preferences will be continued.	Ideal types of Tabernaemontana for commercial cultivation as loose flower will be identified.

b. Crop Management

Theme: Standardization of improved agro-techniques for flower and ornamental crops			
Crop	Centre	Action Plan (2023-24)	Deliverable
Nerium	HC&RI, Coimbatore	Standardization of techniques to manipulate flower bud opening in Nerium: <ul style="list-style-type: none"> Confirmatory trial will be laid out. The findings will be released as a technology for commercial adoption by farmers. 	Technology for manipulation of flower bud opening in Nerium will be available for commercial adoption by farmers.
Jasmine	HC&RI, Coimbatore	Development of improved package of practices for <i>J. sambac</i> cultivars to enhance yield and induce year-round flowering: Confirmation of the techniques standardized.	Development of improved package of practices (plant population, spacing, pruning techniques) for <i>J. sambac</i>

			cultivars to enhance yield and induce year-round flowering.
	RRS, Paiyur	Standardization of foliar nutrition formula for improving yield and quality in <i>Jasminum sambac</i> . Validation of the standardized foliar nutrition formula under OFT.	Availability of a foliar nutrition formula for improving yield and quality in <i>Jasminum sambac</i>
	FRS, Thovalai	Standardization of technology for inducing off-season flowering in <i>Jasminum sambac</i> through pruning and growth regulator application	Development of technology for inducing off-season flowering in <i>Jasminum sambac</i>

C. Remarks of University Research Projects

a. Crop Improvement

S. No.	Project No. & title and project period	Centre	Remarks
1.	HORT/CBE/FLA/HOR/2022/001 Evolving promising Gundumalli (<i>Jasminum sambac</i> L.) genotypes for high flower yield and quality. (January 2022 to December 2024)	HC&RI, Coimbatore	The project may be continued.
2.	HCRI/CBE/HOR/FLO/2021/001 Strengthening germplasm, conservation, documentation and characterization of <i>Ixora</i> (Jan 2021 to Dec 2023)	HC&RI, Coimbatore	The project may be continued.
3.	HORT/THO/NON/2023/001 Evaluation of Celosia accessions and identification of a climate resilient type for flood tolerance (<i>Celosia argentea</i> var. <i>cristata</i>) (Jan 2023 to Dec 2025)	FRS, Thovalai	The project may be continued.

b. Crop Management

S. No.	Project No. & title and project period	Centre	Remarks
1.	HORT/CBE/FLO/HOR/2023/001 Standardization of pruning practices and nutrient requirement under modified planting system of nine budded clone (Acc. Js-36) of <i>Jasminum sambac</i> (Nov 2022 to Nov 2024)	HC&RI, Coimbatore	The project may be continued.
2.	DCM / CBE/ PHY/ HOR/ 2022/001 Nutrio-hormonal manipulation of offseason flowering in Jasmine. (Dec 2022 to Nov 2024)	Dept. of Crop Physiology, Cbe	The project may be continued.

V. MEDICINAL AND AROMATIC CROPS

A. Cultures under MLT/ART/OFT

1. *Gymnema sylvestre* TNGsy- 14 (HC&RI, Coimbatore)

Best genotype with dry leaf weight of 0.75 kg / plant and Gymnemagenin content of 0.72%. The large-scale demonstration will be initiated.

B. Action Plan - 2023-2024

a) CROP IMPROVEMENT

Theme 1. Conservation of medicinal and aromatic plants

S. No.	Activity	Scientist & Centre	Action plan for 2023- 20234	Deliverable
1.	Conservation of medicinal and aromatic plants	Horticulturist, Dept. of Medicinal & Aromatic Crops, Coimbatore	Conservation of rare and endangered medicinal and aromatic plants of Tamil Nadu in collaboration with SMPB, Chennai	Endangered medicinal plants will be conserved

Theme 2. Breeding for development of varieties in medicinal plants

S. No.	Activity	Scientist & Centre	Action plan for 2023- 2024	Deliverables
Sub theme 1: Development of variety in <i>Gymnema</i> (<i>Gymnema sylvestre</i> L.) for high leaf yield and gymnemagenin content through clonal selection				
1.	Evaluation and clonal selection	Horticulturist, Dept. of Medicinal & Aromatic Crops, Coimbatore	Conduct of large-scale demonstration trial for the pre release culture of <i>Gymnema sylvestre</i> genotype, TNGsy- 14	After completion of large-scale demonstration of trials, the culture will be proposed for variety release
Sub theme 2: Development of variety in <i>Centella asiatica</i> for yield and quality through clonal selection				
2.	Evaluation and clonal selection	Horticulturist, HC & RI (W), Tiruchirappalli	Evaluation of agro-morphological and chemotypic variability among the Indian Pennywort (<i>Centella asiatica</i> (L.) Urban) genotypes	Identification of ideal chemotype with high yield
Sub theme 3: Study of genetic diversity on <i>Ocimum sanctum</i> genotypes for high yield and quality				
3.	Evaluation and selection	Horticulturist, Dept. of Medicinal & Aromatic Crops, Coimbatore	Study of genetic diversity and identification of accession with high yield and quality.	Identification of accession with high yield and quality.
Sub theme 4: Evaluation and characterization of <i>Aloe vera</i> for high yield and aloin content				
1.	Evaluation and characterization	Horticulturist, Dept. of Medicinal & Aromatic Crops, CBE	Evaluation and characterization of <i>Aloe vera</i> for high yield and aloin content	<i>Aloe vera</i> for high yield and aloin content will be characterized
Sub theme 5: Development of mutant in senna (<i>Cassia angustifolia</i> L) for high yield and quality				
1.	Evaluation of M3 generations of Senna	Horticulturist, Dept. of Horticulture, AC&RI, Killikulam	Comparing the identified mutants in M ₃ generation with KKL 1 senna	Mutant with high yield and sennoside content will be identified

Sub theme 6: Development of hybrids in glory lily for high yield and quality				
1.	Hybridization	Horticulturist Dept. of Medicinal & Aromatic Crops, Coimbatore	Development of hybrids in glory lily by crossing specific high yielding parents in the existing germplasm	Development of hybrids

b) CROP MANAGEMENT

Theme 1. Development of agro techniques & Post harvest technology

Sub theme :1. Standardization of agro techniques for medicinal & aromatic crops				
1.	Development of agro techniques for Dhavana	Horticulturist & Crop Physiologist, Dept. of Floriculture & Landscape Architecture, Periyakulam	Conduct of confirmation trial for the URP on foliar nutrition of Dhavana	Standardization of Foliar Nutrition for Dhavana
Sub theme: 2. Research focus on screening of medicinal plants for nutritional value				
1.	Screening of medicinal plants for nutritive values & pharmaceutical properties	Horticulturist, Dept. of Medicinal & Aromatic Crops, Coimbatore	Nutritive content profiling and pharmacological studies	Chemoprofiling of selected medicinal plants

C. Remarks on the University Research Projects

S. No.	Name of the University Project & Project Number	Remarks
I. URP - CROP IMPROVEMENT		
1.	HORTI/KKM/ HOR/NON/2022/001 Evaluation of M ₂ and M ₃ generation of senna (<i>Cassia angustifolia</i>) for yield and quality traits	To be continued
2.	HORT/TRI/FRU/HOR/2023/001 - Evaluation of agro-morphological and chemotypic variability among the Indian Pennywort (<i>Centella asiatica</i> (L.) Urban) genotypes	To be continued
II. URP- CROP MANAGEMENT		
1.	HCRI/PKM/HOR/FLO/2021/001 Foliar spray of plant growth regulators and nutrients to enhance the yield and yield character of Davana (<i>Artemisia pallens</i> Wall.)	To be continued

VI. CROP PROTECTION

A. TECHNOLOGIES FOR ADOPTION/OFT/INFORMATION

I. Fruit Crops

1. For Adoption:

1. Management of banana pseudostem borer, *Odoiporus longicollis*

In banana, application of emamectin benzoate 5 SG @ 0.4 g/ l (4 ml/ plant) at 5th, 6th & 7th months after planting using banana pseudostem injector reduced the incidence of pseudostem borer damage up to 92.1 % with higher C: B ratio of 1: 2.25 with no detectable residues in nendran and red banana.

2. Integrated disease management strategy for ring spot disease in Papaya

Adoption of integrated package of treatments *viz.*, Border crop with 3 rows of closely sown maize, raising the seedlings in insect proof net house and foliar spraying of neem oil (3%) three days before planting, soil drenching with humic acid @ 2ml/lit/plant at bimonthly intervals (2nd, 4th and 6th month), soil drenching of *Jeevamruth* (200 lit) mixed with cake (groundnut, gingelly @ 5 kg each in 25 lit water) extracts @ 1 lit/plant thrice at bimonthly intervals (3rd, 5th and 8th month), foliar spraying with combination of zinc sulphate (5g/lit), boron (1g/lit) and urea (10g/lit) at 4th and 7th month after planting and need based application of flonicamid 50WG @ 75 g a.i./ha was found significantly effective in managing the ringspot disease with increased fruit yield and higher C:B ratio.

3. Annual spray schedule for mango anthracnose disease

The annual spray schedule comprising Spray 1 (Copper oxy chloride 50 % WP (2.5g/lit) at pruning during June; Spray 2 (Carbendazim (12%) + mancozeb (63%) WP (1g/lit) at vegetative stage during August; Spray 3 (Copper oxy chloride 50 % WP (2.5g/lit) at vegetative stage during October; Spray 4 (Chlorothalonil (75% WP) (2g/lit) at flower bud initiation during December; Spray 5 (Carbendazim (12%) + mancozeb (63%) WP (1g/lit) at flowering during January 1st week; Spray 6 (*Bacillus subtilis* (Bbv 57) (5g/lit) at flowering during January 3rd week; Spray 7 (Tebuconazole(50%)+trifloxystrobin (25%) 75WG @0.75g/lit at fruit setting during February 2nd week; Spray 8 (*Bacillus subtilis* (Bbv 57) (5g/lit) at fruit development during March 1st week; Spray 9 (Tebuconazole (50%) + Trifloxystrobin (25%) 75WG @0.75g/lit at fruit development during March 4th week; Spray 10 (Chlorothalonil (75% WP) (2g/lit) at fruit maturity & Pre harvest spray during April 3rd week was found significantly effective in managing the mango anthracnose disease with increased fruit yield and higher C:B ratio.

4. Banana endophyte mediated resistance against Fusarium Wilt of Banana

Bio-hardening of banana seedlings with 1% consortia (10^{10} cfu/ml) of *Bacillus velezensis* (VB7) + *Brachybacterium paraconglomeratum* (YEP T2) twice at fortnightly intervals and soil drenching @ 0.5 l / plant at 2, 4, 6 & 8 months after planting was found significantly effective in managing the Fusarium wilt disease of banana with increased fruit yield and higher C:B ratio.

2. For On Farm Trial:

1. Integrated management strategies for Greening disease in acid lime

Treatments proposed:

T1 - RDF + Soil application of enriched FYM (5Kg) + neem cake (500 g) + VAM (200g) & *Bacillus subtilis* (50g) + Azospirillum (50g) + Phosphobacteria (50g) & spray of *B. subtilis* (0.5%) + Imidacloprid 17.8SL (@ 3ml/l) + foliar spraying of ZnSO₄ @ 0.5% & FeSO₄ @ 0.5% + soil application of ZnSO₄ & FeSO₄ (@ 200gm per tree each

T2 –Farmers’ Practice

T3 - Untreated check

Design: RBD; Replications: 7; Number of trees per replication: 4

Observations to be recorded:

Per cent Crop Canopy Incidence (PCCI),

Psyllid population

Yield and CBR

AC&RI, Chettinad [MS]*	:	Dr. K. Manonmani, Assoc. Prof. (Plant Pathology), AC&RI, Chettinad
Coordinating Centre	:	Dr. J. Ramkumar, Assistant Prof. (Agrl. Entomology) AC&RI, Chettinad
TNAU, Coimbatore	:	Dr. N. Indra, Assoc. Prof. (Pl. Patho.), Dept. of Fruit Crops, HC&RI, Cbe Dr.M. Murugan, Professor (Agrl. Entomology), TNAU, Coimbatore
HC & RI, Periyakulam	:	Dr. K. Kalpana, Associate Professor (Plant Pathology) Dr. C. Muthiah, Professor and Head (Dept. Plant Protection)
CRS, Sankarankoil, Tenkasi Dt.	:	Dr. N. Rajinimala, Assoc. Prof. (Plant Pathology), RRS, Ambasamudram Dr. B. Usha Rani, Assoc. Prof. (Agrl. Entomology), KVK, Aruppukottai

* MS-Monitoring Scientist

2. Management of Citrus nematode, *Tylenchulus semipenetrans* in Acid lime

Proposed treatment details

T₁ - Soil drenching with NSKE 5% @ 4 lit/tree + Liquid formulation of *P. lilacinum* @ 60 ml/ tree

T₂ - Carbofuran 3G @ 75g/ tree

T₃ - Fluensulfone 2% GR @ 60g/ tree

T₄ - Untreated control

Design: RBD

Replication: 5

Observations to be recorded:

- Initial and final nematode population in soil and roots
- Root colonization
- Yield and CB ratio

Centre	:	Scientists
TNAU, Coimbatore (Lead centre)	:	Dr. N. Seenivasan, Professor
HC& RI(W), Trichy	:	Dr. P. Vetrivelkai, Assoc. Prof.
HC&RI, PKM	:	Dr. K. Senthamizh, Assoc. Prof.
KVK, Vamban	:	Dr. T. Senthilkumar, Assoc. Prof.

3. For Information

1. Outbreak of mango fruit borer, *Citripestis eutraptera* (35.0%) was recorded in Theni, Dindigul and Krishnagiri districts during May-June, 2022.
2. In jamun, the occurrence of leaf gall (2-12%), leaf twisting weevil (4-15%) and helmet caterpillar (0.2-1.5/10 plants) was observed in roving survey in Theni and Dindigul district.

3.	Tolfenpyrad 15 EC @ 2 ml/ lit. was effective against mango thrips with 90.0% reduction and tolfenpyrad residue was below the quantification limit of 0.025 $\mu\text{g g}^{-1}$ and dissipated to BDL of < 0.025 $\mu\text{g g}^{-1}$ 15 days after the second spray. The residue level of tolfenpyrad was reduced from 0.206 $\mu\text{g g}^{-1}$ and 0.418 $\mu\text{g g}^{-1}$ in unprocessed mango to 0.08 $\mu\text{g g}^{-1}$ and 0.18 $\mu\text{g g}^{-1}$ in processed mango pulp at recommended (150 g a.i ha^{-1}) and double dose (300 g a.i ha^{-1}), respectively.
4.	Highest incidence of citrus greening (38 PCCI) was recorded in Coimbatore Distric followed by Theni District (32PCCI). Papaya ring spot virus (PRSV) was the major disease recorded upto 90 % in Coimbatore, Madurai and Erode Districts
5.	In banana, the ditrophic interaction of bacterial endophytes (<i>B. paraconglomeratum</i> YEPT2 and <i>B. velezensis</i> YEBBR6) resulted in induction of biomolecules of antifungal nature. The novel biomolecules identified as 5 -Hydroxy-2-methyl furfural (HMF), Mucic acid, Amino caprylic acid, Nonanol and Clindamycin at 750
6.	In grapes, spore trap aided inoculum cum weather-based spray schedule containing eight round foliar spray of fungicides viz., Dimethomorph 50%WP (1g/lit), Captan 50% WP (2g/lit), Cymoxanil 50%WP, (1g/lit) and Chlorothalonil 75% WP (2g/lit), alternatively at weekly interval from 2 nd week of pruning to 10 th week, effectively reduced the downy mildew to an extent of 64.0 per cent over control. Similarly, six rounds foliar spray of Hexaconazole 5%SC (1ml/lit), Mancozeb 75%WP (2.5g/lit), Kresoxim-methyl 44.3% SC (1 ml/lit) alternatively from 9 th to 14 th week after pruning (six sprays) effectively reduced powdery mildew to an extent of 80.3 per cent over control.
7.	In grapes, the prophylactic spraying of cinnamon oil 40 EC @ 1 ml/lit thrice at 10 days intervals recorded lowest powdery mildew incidence with 8.13 PDI, and highest yield of 7503 kg/ac as against 24.88 PDI and 4100 kg/ac in control
8.	A rapid, highly specific and sensitive LAMP assay was developed to detect latent infection of anthracnose <i>Colletotrichum gloeosporioides</i> in mango.
9.	The microbial consortia with biochar nanocomposites of PGPR (<i>Burkholderia cepacea</i> , Root endophyte, <i>Rhizobium pusense</i> , <i>Enterobacter hormaeche</i> (1:1:1) and Gel formulations of <i>Bacillus amyloliquefaciens</i> for foliar application was developed for the management of citrus greening disease in acid lime.
10.	Management of root-knot nematode, <i>M. enterolobii</i> and <i>Fusarium</i> wilt disease complex in Guava: New Plantation: Application of <i>Pochonia chlamydosporia</i> and <i>Bacillus subtilis</i> 30g each + 100g FYM / pit at planting followed by drenching 30 mL twice at 30 days interval reduced nematode infestation by 20.3% in soil and 51.2% in root with least Root knot gall index of 2.17. Existing Plantation: Sub-soil application of <i>P. chlamydosporia</i> and <i>B. subtilis</i> @ 30mL each and repeating the thrice at 30 days interval reduced nematode population by 26.7% and 53.6% with root knot gall index 3.17 and Wilt index grade 1.67
11.	Evaluation of turmeric leaf waste against lesion forming nematodes in banana: Soil application of Turmeric leaf powder (TLP) 100 g/plant reduced <i>Radopholus similis</i> and <i>Pratylenchus coffeae</i> populations in soil (53%) and in banana roots (58%). The growth of banana plantlets was significantly higher in TLP @ 100 g/plant treatment.

12.	Evaluation of bacterial endophytes against root lesion nematodes, <i>Pratylenchus coffeae</i> and <i>Radopholus similis</i> in banana: Paring and dipping with consortia (<i>Lycinibacillus fusiformis</i> + <i>Pseudomonas geniculata</i>) liquid formulation @ 10 ml/ sucker significantly increased pseudostem height (36.25%) and recorded lowest root lesion index 2.0 compared to untreated control (4.25).
13.	Water soluble micro-emulsion formulation of <i>Pochonia chlamydosporia</i> : Formulation has a Shelf life of 180 days with a spore load of 11×10^6 / ml. Two applications of emulsion @ 10 ml / plant reduced <i>M. enterolobii</i> infestation in guava recorded 55 % reduction in gall index in guava. Emergence of new shoots and root hairs without infection was observed.

II. Vegetables

1. For Adoption:

1. Outdoor cultivation of paddy straw mushroom (*Volvariella volvacea*) in banana cropping system

Soaking paddy straw in 2% lime /steaming 1h; bundle method, 4 kg at the rate of 10% spawning (Paddy straw-based spawn) with intermittent water spray on mushroom beds. Microclimate temperature of 35-40 °C and relative humidity of 75 to 80 % to be maintained during cropping period.

The average spawn running was completed on 7.6 days, leading to pinhead formation on 9.2 days. The maximum yield per bed was recorded as 0.830 kg/bed; with an average yield of 0.763 kg/bed and bio efficiency of 18.9 percent with a cropping period of 19 to 20 days. The B:C ratio recorded 2.08. Organoleptic test revealed brown colour with mild pleasant flavour and good taste.

2. Integrated Nematode Management in Potato

Soil drenching of *Pochonia chlamydosporia* (10^8 cfu/ml) @ 5 lit/ha + *Bacillus firmus* (2.5×10^8 cfu/ml) @ 5 lit/ha + soil application of neem cake @ 500 kg/ha and inter crop with mustard @ 3:1 ratio significantly reduced the cyst nematode population by 72.0% and 69% in soil and roots respectively over untreated control. The potato tuber yields also increased by 50 % over untreated control with Cost Benefit ratio of 1: 1.9.

2. For On Farm Trial

OFT 1	Management of insects, mites, nematodes and diseases of cucumber under protected cultivation
	<p>Treatments:</p> <p>T₁ – IPDM Module</p> <ul style="list-style-type: none"> • Soil application of <i>Bacillus subtilis</i> (Bbv57) @ 2.5 kg + <i>Pochonia chlamydosporia</i> @ 5 kg/ha • Spraying of Azadirachtin 1% EC 2 ml/L @ 15 and 45 DAP; Imidacloprid 70 WG @ 50g/ha @ 30 DAP. • Installation of Yellow Sticky trap 50 Nos/ ha @ 30 days interval • Drenching of <i>P. chlamydosporia</i> @ 1lit /ha through drip at 30, 60 and 90 DAP • Foliar spaying of micronutrient mixture (0.2% each of ferrous sulphate, zinc sulphate, copper sulphate, magnesium sulphate and 0.1 per cent borax) at 25 DAP • Need based application of Captan 70 % + Hexaconazole 5 % WP @ 1g/l followed by spraying Tebuconazole 50% + Trifloxystrobin 25% @ 1 g/ L and Spiromesifen 22.90 SC 0.75ml/L against mite; Fosetyl-Al @ 0.1% against powdery mildew <p>T₂ - Non-IPDM</p> <p>Design: RBD; Replications: 13; Analysis: Paired t test</p> <p>Observations to be recorded:</p> <ul style="list-style-type: none"> • Pest infestation and Disease incidence • No. of insects/trap at fortnightly interval • Nematode population

	Yield and BC Ratio Residue status																		
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OFT 2	<p>Management of new invasive thrips, <i>Thrips parvispinus</i> in chilli</p> <p>Treatments: T1- Module I (IPM) Seed treatment with thiamethoxam 30 FS - 7.0 g/kg. Border crop - closely spaced three rows of maize/ 3 rows of sorghum Blue sticky traps @ 50 Nos/ha placed at 30 to 60 cm above ground level to trap adult thrips Foliar spray with Tolfenpyrad 15 EC @ 400ml/ha (use high volume sprayer) T2- Module II (Insecticide approach) Seed treatment with thiamethoxam 30 FS - 7.0 g/kg; Application of fipronil 5 SC @ 800 ml/ha or thiociprid 21.70 SC @ 300 ml/ha or Flonicamid 50 WG @ 0.3 g/lit. at bud formation stage (use high volume sprayer) T3- Farmers' practice (Imidacloprid 17.8 SL @ 60ml/ha)</p> <p>Observations to be recorded: Population of thrips from 3 leaves representing top, middle and bottom and expressed as number of thrips per leaf Observations should be recorded from 1 week after transplanting till the completion of vegetative stage at 15 days interval Per cent reduction over control Green pod yield and BC ratio. Residue status</p>																		
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OFT 3.	Validation of TNAU food bait traps for female fruit flies management in Ridge gourd																		
	<p>Treatments: T1 - TNAU food baited female fruit fly trap @ 20 numbers/ acre (replacement of food bait once in a week) T2 - Cue lure trap @ 10 numbers /acre T3 - Control (Trap without food lure)</p> <p>Note: Distance between the treatment – 10 ft Traps and baits will be supplied by Dr. T. Elaiyabharathi</p>																		
	<p>Observations to be recorded: No. of female fruits flies/trap/week (female needs to be checked whether spent/gravid - Dissect out ovary and observe under microscope) Per cent fruit fly damage at active fruiting stage up to harvest Per cent damage & yield reduction over control Yield and BC Ratio</p>																		
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OFT 4	Validation of nano cuelure for male fruit flies management in Ridge gourd																		
	<p>Treatments: T1 – Nano cue lure formulation @ 20 numbers/acre (Replacement of nano cue lure @ 3 months interval) T2 – Cue lure trap @ 10 numbers /acre (replacement once in 45 days) T3 – Control</p> <p>Note: Distance between the treatment – 10 ft Traps and baits will be supplied by Dr. M. Kannan</p>																		
	<p>Observations to be recorded: No. of male fruits flies/trap/week Per cent fruit fly damage at active fruiting stage up to harvest Per cent damage & yield reduction over control Yield and BC Ratio</p>																		
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OFT 5	Management of mealy bugs in tapioca																				
	Treatments: T1: Spraying of azadirachtin 0.3% @ 3 ml/l on 60 DAP + Inoculative release of <i>Anagyrus lopezi</i> @ 250 Nos/ha + Inoculative release of <i>Apertochrysa</i> @ 1000 eggs/ha immediately after infestation of mealybugs T2: Spraying of Thiamethoxam 25WG @ 0.5g/l at 60 DAP followed by flonicamid 50 WG @ 0.3g/l immediately after infestation of mealybugs T3: Untreated control																				
	Observations to be recorded: No. of mealybug colonies/plant at 15 DAT and fortnightly interval Mealybug species Per cent rosette damage at 15 DAT and at fortnightly interval Population of natural enemies, Tuber yield (kg) and BC Ratio																				
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OFT 6	Evaluation of BIPM module for the management of tomato pinworm, <i>Tuta absoluta</i>																				
	Treatments: T1- Installation of water pan pheromone trap @ 40 Nos/ ha at 10 DAT Release of <i>Trichogramma achaea</i> @ 5 cc/ ha on seeing moth attraction in pheromone traps Application of following insecticides on need basis after 30 DAT Spinetoram 11.7 SC @ 500 ml/ ha followed by Cyantraniliprole 10.26 OD @ 150 ml / ha T2- Farmer's Practice T3- Control Note: Parasitoids will be provided by TNAU, Coimbatore																				
	Observations to be recorded: Per cent damage Yield and BC Ratio Residue status																				
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OFT 7	<p>Field evaluation of bioformulations for plant growth promotion, yield enhancement and antagonistic potential against diseases of tomato</p> <p>Treatment details T1. Seed treatment, (10ml/kg), seedling dip (10ml/lit), soil application (400ml/acre) at 30 DAT + foliar spray (0.2 %) on 60 DAT – Bbv 57, BST 18, TEB10 and Q strain T2. Farmers practice T3- Control Design: RBD; Replication: Seven Observations to be recorded Disease incidence Yield (Kg/ha) Centres to be involved:</p> <table border="1" data-bbox="316 535 1380 829"> <thead> <tr> <th>Centre</th> <th>:</th> <th>Incharge Scientist</th> </tr> </thead> <tbody> <tr> <td>TNAU, CBE (LC)</td> <td>:</td> <td>Dr. S. Harish Assoc. Prof. (Pl. Pathol) and Dr. G. Karthikeyan, TNAU, Coimbatore</td> </tr> <tr> <td>AC & RI, MDU</td> <td>:</td> <td>Dr. I. Yesuraja, Professor (Pl. Pathology)</td> </tr> <tr> <td>HC & RI., Periyakulam</td> <td>:</td> <td>Dr. K. Kalpana, Assoc. Prof. (Plant Pathology)</td> </tr> <tr> <td>AC & RI, KDM</td> <td>:</td> <td>Dr. R. Thilagavathi, Asst. Prof. (Plant Pathology)</td> </tr> </tbody> </table>	Centre	:	Incharge Scientist	TNAU, CBE (LC)	:	Dr. S. Harish Assoc. Prof. (Pl. Pathol) and Dr. G. Karthikeyan, TNAU, Coimbatore	AC & RI, MDU	:	Dr. I. Yesuraja, Professor (Pl. Pathology)	HC & RI., Periyakulam	:	Dr. K. Kalpana, Assoc. Prof. (Plant Pathology)	AC & RI, KDM	:	Dr. R. Thilagavathi, Asst. Prof. (Plant Pathology)
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OFT 8	<p>Management of root knot nematode, <i>M. incognita</i> and <i>Fusarium</i> sp wilt disease complex in tomato and bitter gourd by using <i>Clonostachys rosea</i></p> <p>Proposed treatment details T₁- <i>Clonostachys rosea</i> @ 6 kg/ha T₂– Carbofuran 3G @ 33 kg /ha T₃– Carbendazim 2% @1.5 g/lit. T₄ - Untreated control Design: RBD, Replications: 5 Observations to be recorded</p> <ul style="list-style-type: none"> • Initial and final nematode population in soil and roots • Root colonization • Wilt incidence • Yield & CB ratio <table border="1" data-bbox="292 1249 1404 1428"> <thead> <tr> <th>Centre</th> <th>:</th> <th>Scientists</th> </tr> </thead> <tbody> <tr> <td>TNAU, Coimbatore (Madampatti) (LC)</td> <td>:</td> <td>Dr. G. Jothi, Professor</td> </tr> <tr> <td>HC&RI, PKM Erumainayakkanpatti</td> <td>:</td> <td>Dr. K. Senthamizh, Assoc. Prof.</td> </tr> <tr> <td>AC & RI, Vazhavachanur</td> <td>:</td> <td>Dr. P. Senthilkumar, Asst. Prof.</td> </tr> </tbody> </table>	Centre	:	Scientists	TNAU, Coimbatore (Madampatti) (LC)	:	Dr. G. Jothi, Professor	HC&RI, PKM Erumainayakkanpatti	:	Dr. K. Senthamizh, Assoc. Prof.	AC & RI, Vazhavachanur	:	Dr. P. Senthilkumar, Asst. Prof.			
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MLT	<p>Title: Evaluation of short-duration and high-yielding oyster mushroom</p> <p>Treatment Details T1–TNAU-KKM-20-01 (<i>Pleurotus djamor</i>) T2–Oystermushroom-<i>Pleurotus eous</i> var. APK1 T3–Oystermushroom-<i>Pleurotus djamor</i> var. MDU1 Design: RBD; Replications: 7 (Three beds/replication) Observations to be recorded:</p> <ul style="list-style-type: none"> • Days for spawn running • Days for the first harvest • Total crop duration • Yield(kg/bed) • Biological efficiency and CB ratio. • Organoleptic evaluation data 															

Centres to be involved			
S. No.	Centres	Scientist In-charge	Location
	AC&RI, ECK, Thanjavur [MS]* Coordinating Centre	Dr. V. Ramamoorthy, Asst. Professor (Plant Pathology)	Not applicable
1.	TNAU, CBE (one location)	Dr. G. Thiribhuvanamala, Professor (Pl. Pathology)	Dept. of Plant Pathology, TNAU
2.	TNAU, CBE (one location)	Dr.P. Mahalakshmi, Asst. Professor (Pl. Pathology)	Farmer's field
3.	AC&RI, MDU (one location)	Dr. N. Revathy, Prof. (Pl. Pathology)	Dept. of Plant Pathology, AC&RI, MDU
4.	HC&RI, PKM (three locations)	Dr. A. Vijayasamundeeswari, Assoc. Prof. (Pl Pathology)	HC&RI, Periyakulam
5.			Farmer's field
6.			Farmer's field
7.	AC&RI, Chettinad, Sivagangai (two locations)	Dr. K. Manonmani, Assoc. Prof. Plant Pathology	Farmer's field
8.			Farmer's field
9.	AEC&RI, Kumulur, TRY (two locations)	Dr. V. K. Satya, Asst. Prof. (Plant Pathology)	Dept. of Basic Engineering and Applied Sciences, AEC&RI, Kumulur,
10.			Farmer's field
11.	AC&RI, KDM (one location)	Dr. R. Thilagavathi, Asst. Professor (Pl. Pathology)	Dept. of Plant Pathology, AC&RI, Kudumiyamalai
12.	RRS, APK (one location)	Dr. R. Akila, Assoc. Prof. (Pl Patho.)	RRS, APK
13.	ICAR-KVK, TPS (three location)	Dr. K. Kavitha, Assoc. Prof. (Pl Pathology)	Farmer's field
14.			Farmer's field
15.			Farmer's field
16.	RRS, VRI (Five locations)	Dr. M. Paramasivan, Assoc. Prof. (Plant Pathology)	Farmer's field
17.			Farmer's field
18.			Farmer's field
19.			Farmer's field
20.			Farmer's field
21.	ADAC&RI, TRY	Dr. A. Sangeetha, Assistant Professor	Dept. of Plant Pathology, ADAC&RI, Trichy
22.	ICAR-TNAU-KVK, Papparapatti, Dharmapuri (Two locations)	Dr. M. Deivamani, Assistant Professor (Pl. Pathology)	Farmer's field
23.			Farmer's field
24.	NPRC, Vamban (one location)	R Ramjegathesh, Assistant Professor (Plant Pathology)	Farmer's field
25.	CRS, Aliyarnagar (one location)	Dr. P. Latha, Assoc. Prof. (Pl. Pathology)	Farmer's field
26.	AC&RI, Vazhavachanur (Two locations)	Dr. P. Mareeswari, Prof. (Pl. Path.)	Dept. of Plant Pathology, AC&RI, Vazhavachanur
27.			Farmers Field
28.	AC&RI, KKM (one location)	Dr. J. Sheela, Professor (Pl. Path.)	Dept. of Plant Pathology, AC&RI, KKM
29.	AC&RI, ECK, Thanjavur (one location)	Dr.S. Madhiyalagan, Assoc. Prof. (Pl. Path.)	Dept. of Plant Pathology, AC&RI, ECK
For Information			
1.	Out of 54 farm gate samples, 28 samples had pesticide residues (chilli, tomato, brinjal, okra, cauliflower, curry leaf, coriander, amaranthus), Fipronil and difenaconazole residues exceeded FSSAI MRL in two chilli samples and thiamethoxam in one tomato sample.		

2.	Flonicamid 50 WG at 75 g and 150 g a.i ha ⁻¹ had a half-life ranging from 2.41 to 3.08 days in snake gourd and 1.78 to 2.03 days in ridge gourd. Safe waiting periods based on Codex MRL (0.2 µg g ⁻¹) were 0.25 to 3.10 days for snake gourd and 0.81 to 2.67 days for ridge gourd.
3.	Tomato, brinjal and okra washed with tap water for 1 min. + dipping in 2% NaCl for 1 min. reduced >50% of synthetic pyrethroid, organophosphorous and neonicotinoid residues.
4.	BIPM module (Pheromone trap @ 40 / ha + <i>Trichogramma achaea</i> @ 5 cc / ha + spinetoram 11.7 SC @ 500 ml /ha + cyantraniliprole 10.26 OD @ 150 ml / ha) recorded highest per cent reduction in tomato pinworm larval population (62.48%), fruit damage (65.87%), highest fruit yield & BC ratio of 1:2.9 with residue levels (0.01 mg each) not exceeding the CODEX MRL (0.06 mg / kg of tomato for spinetoram & 0.5 mg / kg of fruiting vegetables for cyantraniliprole).
5.	Chitosan-O-Arginine [CS-O-Arg] and its nanoformulation were synthesized from marine waste crude chitosan, which had insecticidal, antifeedant, growth inhibitory effect against Diamond backmoth, <i>Plutella xylostella</i> at 1000 and 300 ppm within 72 hrs after treatment, respectively and disrupted larval midgut epithelial cells. Globally, it is the first report on insecticidal effect of CS-O-Arg.
6.	Pectin gel formulation of liquid proteineX bait was effective up to 10 days in field conditions to catch female (10/trap) and male fruit flies (33/trap)
7.	<i>Tetranychus urticae</i> exhibited extremely high level of resistance to spiromesifen (193.04 to 452.61-fold), which was confirmed by higher binding affinity with detoxifying enzymes viz., delta GST, MFO and esterase (-9.97, -11.85 and -9.29 Kcal mol ⁻¹) in <i>in-silico</i> docking analysis
8.	Among a total of 36 indigenous <i>Bt</i> isolates, T15 (cry1 and vip3A), T29 (cry1, cry2Aa and vip3A) and T505 (cry1 and cry2Aa) caused 50-65 % mortality of <i>Leucinodes orbonalis</i> .
9.	Biosensor for rapid detection of selected insecticides in gourds: Acetylcholinesterase (AChE) and Glutathione S-Transferase (GST) enzyme-based biosensor method was standardized for detection of organophosphorous, synthetic pyrethroid, carbamate and neonicotinoid insecticides with minimum sample processing
10.	Tomato leaf curl New Delhi virus (ToLCNDV) and Bittergourd yellow mosaic virus (BgYMV) was confirmed in bittergourd. Seed transmission was found to be 43.2 % in which ToLCNDV was predominant
11.	Bacterial endophytes viz., <i>Bacillus velezensis</i> , <i>B. tequilensis</i> and <i>B. licheniformis</i> triggered antiviral immunity against GBNV in tomato
12.	Wild mushrooms belonging to <i>Volvariella volvacea</i> , <i>Auricularia auricula judae</i> , <i>Lepista sordida</i> , <i>Russula olivacea</i> , <i>Calocybe indica</i> <i>Oudemansiella radicata</i> and <i>Lentinus squarrosulus</i> , <i>Pleurotus djamor</i> , <i>P. ostreatus</i> , <i>Trametes versicolor</i> , <i>Ganoderma lucidum</i> , <i>Schizophyllum commune</i> and <i>Agaricus campestris</i> were documented, pure cultured and taxonomically identified
13.	Medicinal mushroom, <i>Schizophyllum commune</i> could be cultivated in open bag method using paddy straw substrate. Fortified product of <i>S. commune</i> possessed high antioxidant and phytochemical properties.
14.	Milky mushroom entries viz., TNAU KDM 20-05, TNAU-CBE-21-07, TNAU-CBE -21-12, TNAU-CBE -20-11, and TNAU-CBE -21-15 are promising with higher bio efficiency of 105-123%.
15.	Identification of source of resistance against root knot nematode, <i>Meloidogyne incognita</i> in vegetable crops:

	In Chilli: Eight lines were identified as highly resistant <i>viz.</i> , PKM CA-20, PKM CA-33, PKM CA-38, PKM CA-08, PKM CA(C)1, PKM CA(B)2, PKM CA(P)2 & PKM CA(GL) and Two lines were showed resistant reaction (PKMCA-32 & PKMCA - BL-2). In brinjal: Two lines were identified as highly resistant (PKM B-E-1) and PKMB-G-1 and One was showed resistant (PKM BB-2).
16.	Dispersion of <i>Pochonia chlamydosporia</i> liquid formulation through drip irrigation: The spores delivered through emitters up to 22 m from the mixing tank. Spore load (2.6×10^4 / ml) at the final emitter (22 m) was sufficient enough to colonize nematode eggs. Rhizosphere soil also showed the presence of spores (2×10^4 / g).
17.	Designing nano-emulsion formulation of <i>Purpureocillium lilacinum</i> : A stable nano-formulation of nematode egg parasitic fungus, <i>Purpureocillium lilacinum</i> with long shelf-life (> 6 month) was developed. The average particle size and zeta potential of nano emulsion is 226.6 nm and -54.30 mV. Soil drenching of nano-formulation of <i>P. lilacinum</i> at 5.0 mL/L resulted on suppression of <i>M. incognita</i> populations in soil (58.8 - 67.2%) and root (56.2 – 62.5%) with highest egg parasitization (81-88%).
18.	Management of root knot nematode, <i>Meloidogyne incognita</i> in brinjal using botanicals: Soil application of <i>Simarouba</i> leaf powder @ 14kg/ha near the root zone of brinjal reduced the root knot nematode population by 65.8 % reduction over control.
19.	Management of root knot nematode, <i>Meloidogyne incognita</i> in brinjal using botanicals: EC formulation containing blend of <i>Citrullus colocynthis</i> , <i>Justicia adhatoda</i> , <i>Coccinia cordifolia</i> , <i>Vernonia cinerea</i> and <i>Cassia occidentalis</i> caused mortality of eggs (82.5 %) and second stage juveniles (94.6%) of <i>Meloidogyne incognita</i> under <i>in vitro</i> .
III. Spices and Plantation crops	
1. For adoption:	
1. Management of coconut whitefly complex with TNAU capsule: Release of <i>Encarsia guadeloupae</i> @ 100 parasitoids /ac (10 leafbits/ac); installation of yellow sticky traps (5 ft. x 1.5 ft.) smeared with castor oil @ 8/ ac; release of <i>Apertochrysa astur</i> eggs @ 400/ac reduced the rugose spiraling whitefly population to the tune of 65.69 per cent and increased the parasitisation activity of <i>Encarsia</i> sp and <i>Apertochrysa astur</i> 106.38% and 119%, respectively.	
2. IDM strategy for coconut root wilt disease	
The IDM package include, application of recommended dose of fertilizers, organic manuring (50 kg FYM + 5 kg neem cake per palm per year & green manuring); soil application of CuSO ₄ (200 g) + MgSO ₄ @ 1000 g/palm (CuSO ₄ @ 100 g, MgSO ₄ @ 500 g should be applied alternatively at three months intervals twice in a year); soil application of 100 g each of <i>Trichoderma asperellum</i> (Tv1), <i>Bacillus subtilis</i> (Bbv 57), Phosphobacteria, Azospirillum and 50 g VAM per palm/year all mixed with 5 kg of decomposed farm yard manure two times at six months intervals; root feeding with TNAU Coconut tonic (40 ml + 160 ml water) twice at six months intervals; soil drenching with mass multiplied TNAU "COCOCON" @ 2 litre mixed with 8 litres of water per palm at two month intervals and need based (if leaf spot/blight/rot symptom is noticed) crown application of hexaconazole (2 ml + 300 ml water).	
2. For On Farm trial:	
Management of Quick Wilt in Pepper	
T1 - Soil application of <i>Bacillus subtilis</i> + <i>Trichoderma asperellum</i> + <i>Purpureocillium lilacinum</i> each @ 2.5 kg/ha + VAM (2 kg/ha), 2-times at 6-month intervals. Spraying of Bordeaux mixture (1%) as soon as the symptom appears on leaves, followed by spraying of 0.25% metalaxyl + mancozeb after 15 d.	
T2- Farmer's practice	

T3- Control

Observations to be recorded:

- Quick wilt incidence (%)
- Nematode population
- Berry yield
- C:B ratio

Design: RBD

Replication: 7; No. of trees per replication: 10

Centres to be involved

Centre	:	Incharge Scientist
TNAU, CBE	:	Dr. S. Maruthasalam
HC&RI, Perivakulam	:	Dr. A. Viiavasamundeeswari
HRS, Yercaud	:	Dr. S. Maruthasalam

3. For Information

1. Safe waiting period of imidacloprid 17.8 SL (@ 0.15 ml/ lit.) arrived with MRL of $2 \mu\text{g g}^{-1}$ was 1.85 days and flonicamid 50 WG (@ 0.35 g/ lit.) arrived with MRL of $1.5 \mu\text{g g}^{-1}$ was 7.88 days in coriander leaves. Imidacloprid was found safer than flonicamid because of its short waiting period. Residues were not found in seeds. Out of 12 market samples tested (with pesticide spray history), only one leaf sample was found to have $1.17 \mu\text{g g}^{-1}$ of imidacloprid residues.
2. In cardamom, farm gate and market samples, imidacloprid, fipronil, tebuconazole, fluopyram and acetamiprid residues detected were above EU MRL $0.05 \mu\text{g g}^{-1}$ EU MRL $0.05 \mu\text{g g}^{-1}$. Maximum concentration was detected in the outer coat.
3. Soil application of coconut consortia @ 5 litre/acre at 3-month intervals + soil drenching with copper hydroxide @ 0.25% + application of recommended dose of fertilizers showed higher reduction (25.40%) of basal stem rot disease, after 6 months and higher (16.85 nuts) nut yield.
4. Soil application of *T. asperellum* @ 25 g/cent at sowing + crown application of *B. subtilis* endophyte @ 10 g/l of water at 3 & 6 MAS + application of AMF @ 50 g/cent at 3-month reduced the bud rot disease incidence by 77% and enhanced the per cent germination (91%).

IV. Flowers, Medicinal and Aromatic Crops

1. For adoption:

In jasmine, adoption of IPM package comprising of soil application of fipronil 0.3 GR @ 3 g/ plant immediately after pruning ; foliar spray with following chemicals as sequential spray once in 15 days with *Bt. sp. kurstaki* @ 2ml/lit; Azadirachtin 1% @ 2 ml/lit; Chlorantraniliprole 18.5 SC @ 0.5 ml/lit; Spinosad 45 SC @ 0.5 ml/lit; Thiacloprid 240 SC @ 1 ml/lit reduced bud worm & blossom midge by 56.12 & 61.31 per cent with increased yield of (32.51 q/ha) and CB ratio of 1: 2.47.

2 Development of IPM strategy for the management of color/root rot and nematode disease complex in medicinal coleus

Dipping of coleus cuttings in liquid formulation of *B. subtilis* (Bbv57) @2ml/lit + soil application of *B. subtilis* (Bbv57) at 1 lit /ha + *P. chlamydosporia* @ 1lit/ha at the time of planting and 30 & 45 DAP is recommended for the management of collar rot /root rot and nematode disease complex, which showed lowest root rot incidence with 72.6% reduction and reduced nematode population in soil (42.5% reduction) and root (67% reduction) with a C:B ratio of 1: 2.04.

2. For on Farm trial: Nil	
3. For Information	
1.	Thiamethoxam 25 WG (LC ₅₀ = 0.537 ppm) was effective against mealybugs in flower crops & found to be relatively safe and selective to the predators of mealybugs <i>viz.</i> , <i>Chrysoperla zastrowi sillemi</i> (LC ₅₀ = 203.635 ppm) & <i>Cryptolaemus montrouzieri</i> (LC ₅₀ = 401.098 ppm)
2.	Foliar spray with tebuconazole 50% + trifloxystrobin 25 % at 1g/ lit on 30,60 and 90 DAP was found to be effectively reducing <i>Colletotrichum</i> and <i>Alternaria</i> leaf spots and soil drenching on 30, 60, 90 and 120 DAP was effective in reducing the soil borne diseases in Jasmine.
3.	In tuberose, foliar pathogens <i>viz.</i> , <i>Colletotrichum</i> sp., <i>Drechslera halodes</i> and <i>Phoma</i> sp. were found to be consistently associated and foliar spray of tebuconazole 50% + trifloxystrobin 25 % at 1g/ lit at 45 and 60 DAP was found to reduce foliar diseases (76.47 %) with high flower yield (13.55 t/ha).
4.	The seaweed extract of the <i>Sargassum cristaefolium</i> (10%) was found to be effective against <i>Alternaria polianthi</i> leaf spot disease of tuberose under <i>in vitro</i> screening
5.	A new record of Cucumber mosaic virus was reported with 12 % incidence at Edappadi of Salem district in medicinal coleus.
6.	In Gloriosa, two viruses <i>viz.</i> , Tobacco streak virus and Cucumber mosaic virus were documented for the first time in India with 10-23% and 25- 55% in Coimbatore and Dindigul Districts.
8.	Among 41 bacterial isolates from senna rhizosphere, <i>Bacillus subtilis</i> (BSR 7) recorded 55.34% degradation of AFB1 aflatoxin and among 78 botanicals tested for aflatoxin detoxification, <i>Spervenia arvensis</i> showed 94.02% degradation ability against aflatoxin in senna
9.	Effect of Water-soluble formulation of <i>Pasteuria penetrans</i> against <i>M. incognita</i> in tuberose: Application of <i>Pasteuria penetrans</i> formulation @2 ml / plant showed 54 % reduction in gall formation and 63 % reduction in egg masses over control.

B. ACTION PLAN: 2023-24			
I. FRUITS			
Title	Name of the Scientist & Centre	Activities	Deliverables
Action plan 1 Monitoring Insect Pests of fruit Crops	Dr. S. Suganya Kanna, HC&RI, PKM (TL) Dr. K. Govindan, RRS, Paiyur Dr. K. Elanchezhayan, AC&RI, KKM Dr. S. Jeyaprabhavathi, RRS, Vridhachalam Dr. D. Rajabaskar, KVK, Dharmapuri	<ul style="list-style-type: none"> Monitoring of insect pests of major fruit crops viz., mango, banana, guava, grapes, cashew through Roving survey at fortnightly intervals in the identified district Depositing preserved samples of newer categories of insects with the TNAU Insect Biodiversity Laboratory for documentation and cataloguing Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets immediately. Submission of high-quality photos 500 nos each to the Theme Leader for preparation of Bulletin Reporting outbreak of pests to DCPSS Monthly pest monitoring report to the Government and other stakeholders 	Pest status of horticultural crops Monthly pest monitoring report Bulletin by the Team of Scientists
Action plan 2 Biointensive Management of psyllids in citrus ecosystem	Dr. C. Muthiah, HC & RI, PKM Dr. K. Suresh, KVK, MDU Dr. S. Sheeba Joyce Roseleen, HC&RI(W), Trichy Dr. L. Allwin, RRS, ASD	<ul style="list-style-type: none"> Morphological and molecular characterization of psyllids in citrus. Identification of the vector (or) dispersal agent involved in citrus green. Biointensive management of psyllids in citrus. 	Psyllid diversity and its management will be made available
Action Plan 3 Monitoring and management of insect pests in the paclobutrazol applied mango field in Krishnagiri district	Dr. P. Thilagam, HC&RI, Jeenur Dr. K. Govindan, RRS, Paiyur	<ul style="list-style-type: none"> Monitoring major insect pests in the Paclobutrazol applied mango field Assessing the effect of paclobutrazol on the infestation of insect pest population Management of insect pest in paclobutrazol treated mango fields with eco-friendly approaches 	Devising management practises for major pest of mango for offseason production of mango
PLANT PATHOLOGY			
Action Plan 4 Monitoring diseases of fruits and correlation with weather parameters and collection of data set for Artificial Intelligence (AI) based diagnosis	Theme Leader: Dr. N. Indra, TNAU, CBE Dr. J. Sheela, AC&RI, KKM Dr. M. Devanathan, HC&RI (W) TRY; Dr. S.K. Manoranjitham, AC&RI, ECK; Dr. A. Vijayasamundeeswari, HC&RI, PKM; Dr. R. Thilagavathi, AC&RI, KDM; Dr. K. Kavitha, KVK, Thirupathisaram	<ul style="list-style-type: none"> Monitoring of diseases of fruit crops through Roving survey and fixed plot survey at fortnightly intervals in the identified district Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets. Submission of high-quality photos (500 numbers) to the lead centre for AI. Reporting outbreak of diseases to DCPSS 	<ul style="list-style-type: none"> Disease status of fruit crops and Monthly disease monitoring report Bulletin by the Team of Scientists

	Dr. M. Deivamani, KVK, Dharmapuri Dr. S. Sundaravadana, ARS, BSR Dr. K. Manonmani, AC&RI, Chettinad	<ul style="list-style-type: none"> Monthly pest monitoring report to the Government and other stakeholders 	
Action Plan 5 Exploration of endophytes, botanicals and biocontrol agents for the management of leaf spot and fruit rot of custard apple.	Theme Leader: Dr. R. Akila, Assoc. Prof. (Plant Pathology), RRS, Aruppukottai	<p>Management of custard apple- leaf spot and fruit rot (<i>Colletotrichum gloeosporioides</i>) and Apple ber- Black leaf spot (<i>Isariopsis personata</i> var. <i>zizyphi</i>)</p> <p>In vitro studies</p> <p>T1: Endophyte 1 isolated from medicinal arid zone fruit crops T2: Endophyte 2 isolated from arid zone fruit crops T3: NSKE (5 %) T4: Mancozeb 0.2% T5: Carbendazim + Mancozeb 0.1% T6: Chlorothalonil 0.1% T7: <i>Bacillus subtilis</i> (Bbv57) (0.5%) T8: Control</p> <p>Design: CRD; Replications: 3</p> <p>In vivo studies</p> <p>Effective Endophyte, bio control agent, botanical and fungicides at minimum dose will be tested at field level at RRS, Aruppukottai</p> <p>Design: RBD Replications: 3</p> <p>Observations to be recorded</p> <p>Leaf spot (PDI) Fruit rot incidence Identification of endophytes</p>	Effective endophyte, botanical and fungicides for the management of major diseases of arid zone fruit crops
Action Plan 6 Diagnosis, identification and characterization of crown rot of papaya	Theme Leader: Dr. N. Indra , Assoc. Prof. (Plant Pathology), HC&RI, Coimbatore Dr. P. Renukadevi, Prof. (Pl. Path.) DMAC, TNAU, CBE Dr. K. Kalpana, Assoc. Prof. (Plant Pathology), HC&RI, Periyakulam	The causal organism of crown rot disease will be identified and characterized at cultural and molecular levels.	Etiology of crown rot causing pathogen in papaya will be studied for developing the management strategies.
Action Plan 7 Integrated management of Avocado wilt and borer	Theme Leader: Dr. A. Vijayasamundeeswari , Assoc. Prof. (Plant Pathology), HC&RI, Periyakulam Dr. S. Suganya Kanna, Assoc. Prof. (Agrl.	Integrated Management of wilt and borer Treatment details T1 – IPDM Trapping the adult beetles using SHB trap (Lures with α – copaene + Quercivorol) @ 5 traps /acre.	An effective management strategy for Avocado wilt and borer will be made available

	Entomology), HC&RI, Periyakulam	Swabbing/spraying of tree trunks with <i>Beauveria bassiana</i> @ 5g/litre as spray or 50g/500ml water as swabbing. Application of <i>Bacillus subtilis</i> (10 ⁸ cfu) + <i>Trichoderma asperellum</i> (10 ⁷ cfu) @ 2.5 kg/ha mixed with FYM (50 kg) + Neem cake applied around the root zone, drenching with Bordeaux mixture 0.1% with onset of monsoon (need based) followed by drenching with 0.25 % metalaxyl + Mancozeb or 0.2 % Fosetyl AI) after 15 days T2 – Farmer's practice T3 – Control Replication: 7; Trees per replication: 3 Observations to be recorded i) Percentage wilt incidence ii) Number of trap catches (No./trap) iii) Per cent stem/twig damage iv) Yield per plant	
Action Plan 8 Management of root-knot nematode, <i>M. enterolobii</i> and <i>Fusarium</i> wilt disease complex in Guava	AC&RI, Coimbatore Dr. A. Shanthi Dr. N. Swarnakumari Dr. N. Indra HC&RI(W), Trichy Dr. P. Vetrivelkalai Dr. K. Yamunarani HC &RI, Periyakulam Dr. K. Senthamizh Dr. A. Vijayasamundeevari KVK, Pongalur Dr. P. Kalaiarasan	Treatment details T ₁ – Consortia (<i>Bacillus firmus</i> + <i>Lycinibacillus fusiformis</i> + <i>Pochonia chlamydosporia</i>) @ 30 ml + <i>Trichoderma asperellum</i> @ 5g/tree thrice at monthly intervals. T ₂ - Growing of marigold at the basin of tree (10 seedlings / tree) + <i>Trichoderma asperellum</i> @ 5g/tree thrice at monthly intervals. T ₃ – Carbofuran 3G @ 60 g + Carbendazim 2% @ 2g /L / tree and repeating the same after 3 months T ₄ - Fluopyram 400 SC @ 2 ml / L and repeating the same after 3 months. T ₅ - Untreated control Observation to be recorded ➤ Final nematode population in soil and roots ➤ Gall index ➤ Wilt incidence ➤ Yield (Kg/tree)	Development of effective management method for nematode wilt disease complex in Guava
II. VEGETABLES			
Action Plan 1 Monitoring Insect Pests of vegetable Crops	Dr. B. Vinoth Kumar, KVK, Ooty Dr. T. Elaiyabharathi, TNAU, CBE Dr. S. Suganya Kanna, HC&RI, PKM	• Monitoring of insect pests of vegetables through Roving survey @ fortnightly intervals in the identified district	Pest status of horticultural crops Monthly pest

	Dr. K. Govindan, RRS, Paiyur	<ul style="list-style-type: none"> • Depositing preserved samples of newer categories of insects with the TNAU Insect Biodiversity Laboratory for documentation and cataloguing • Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets immediately. • Submission of high-quality photos (500 numbers) to the Theme Leader for preparation of Bulletin • Reporting outbreak of pests to DCPSS • Monthly pest monitoring report to the Government and other stakeholders 	monitoring report Bulletin by the Team of Scientists
Action Plan 2 Monitoring of Pesticide residues in vegetables	TNAU, CBE Dr. K. Bhuvanewari, Professor (Entomology) Dr. A. Suganthi, Asst. Professor (Entomology) Dr. M. Alagar, Asst. Professor (Entomology)	Collection of farm gate samples at monthly interval from Coimbatore district for residue analysis Vegetables: Bhendi, Brinjal, Tomato, Bittergourd, Snakegourd, Green Chillies, Cauliflower, Beetroot, Curryleaf, Amaranthus, Coriander. samples per vegetable at bimonthly intervals/year (Total no. of samples - 6*11 = 66 samples per year)	Status of pesticide residue in farm gate samples of vegetables will be made available through the NABL-PTL
Action Plan 3 Monitoring mite diversity in vegetable crops ecosystem in Tamil Nadu	Dr. E. Sumathi, (Coimbatore, Tirupur dt.) Dr. V. Baskaran, (Erode, Salem and Namakkal Dt.) Dr. B. Vinothkumar, KVK, Ooty	<ul style="list-style-type: none"> • Documentation of mite diversity in vegetable crops in Tamil Nadu through roving survey at fortnightly interval*. • Specimens to be sent to the Professor and Head, Department of Agrl. Entomology, CPPS, TNAU, CBE for identification. 	Status of mite diversity in vegetable crops of Tamil Nadu will be available Bulletin on mite diversity in vegetable ecosystem
Action Plan 4 Monitoring diseases of vegetables and correlation with weather parameters and collection of data set for Artificial Intelligence (AI) based diagnosis	Theme Leader: Dr. S. Vanitha, TNAU, CBE Dr. K. Yamuna Rani, HC & RI (W) TRY; Dr. M. Karthikeyan, AC & RI, VVNR; Dr. M. Ramamoorthy, AC & RI, ECK; Dr. K. Kalpana, HC & RI, PKM; Dr. V. Ravichandran, TCRS, Yethapur Dr. R. Akila, RRS, Aruppukottai Dr. R. Thilagavathi, AC & RI, KDM;	<ul style="list-style-type: none"> • Monitoring of diseases of vegetable crops through Roving survey and fixed plot survey at fortnightly intervals in the identified district • Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets • Submission of high-quality photos (500 numbers) to the Lead centre for AI. • Reporting outbreak of diseases to DCPSS • Monthly pest monitoring report to the Government and other stakeholders 	<ul style="list-style-type: none"> • Disease status of fruit crops and Monthly disease monitoring report Bulletin by the Team of Scientists
Action plan 5 Evaluation of Sett Treatment Device	Theme Leader: Dr. V. Ravichandran	Treatment Details	Package for developing healthy

for developing healthy sett nursery	Assoc. Prof. (Path.), TCRS, Yethapur Dr. P.A. Saravanan, Assoc. Prof. (Ento.), TCRS, Yethapur Dr. M. Velmurugan, Assoc. Prof. (Hort.), TCRS, Yethapur	<ul style="list-style-type: none"> Evaluation of insecticides and fungicides and its combinations for sett treatment in cassava Testing the suitability of micronutrients / cassava booster / bioagents and their combination for sett treatment in cassava CMD reduction in the setts through physical and chemical sett treatment <p>Observations to be recorded</p> <ol style="list-style-type: none"> Germination and vigour of the settlings Pest and disease incidence 	cassava nursery free from pest and diseases
Action plan 6 Collection and selection of potential mushroom species suitable for commercial utilization	Theme Leader: Dr. G. Thiribhuvanamala, Prof. (Pl. Pathology), TNAU, CBE AC&RI, Madurai Dr. M. Revathy, Prof. (Pl. Path.) AC&RI, Periyakulam Dr. A. Vijayasamundeeswari, Asst. Prof. (Pl. Path.)	Exploitation of mushroom biodiversity for commercial utilization Observations to be recorded Collection of different mushroom species/ strains/ pure culturing and maintenance Testing potential mushroom strains/ species for edibility/ industrial applications	Strengthening of mushroom culture collection, identifying promising strains/ species and developing mass production technology
Action plan 7 Bioprospecting of edible and medicinal mushrooms	Theme Leader: Dr. G. Thiribhuvanamala, Prof. (Pl. Pathology), TNAU, CBE	Cultivation of medicinal mushrooms, using locally available substrates, extraction of biomolecules and testing against plant pathogens, assay of nutraceutical values	Technology for cultivation of medicinal mushrooms using locally available substrates Fungicidal molecules identified for plant disease management
Action plan 8 Performance testing of potential mushroom species suitable for commercial utilization	Theme Leader: AC&RI, Coimbatore Dr. G. Thiribhuvanamala, Prof. (Pl. Pathology) AC&RI, Madurai: Dr. M. Revathy, Prof. (Pl. Path.) AC&RI, Kudumiyamalai Dr. R. Thilagavathy, AP (Pl. Path.) HC&RI, Trichy Dr. M. Devanathan, Prof. (Pl. Path.) KVK, Pappalapatti	Testing of wild mushroom strains of milky mushroom in comparison with APK2 1. TNAU-CBE-20-15 2. TNAU- MDU-20-05 3. APK2 Replications; 7 No. of beds /replication: 3 Data to be recorded <ul style="list-style-type: none"> Days for spawn run Days for first harvest Av. no. of sporophores/500 g substrate 	Potential strain of milky mushroom selected will be further forward for OFT

	Dr. M. Deivamani, RRS, Vridhachalam Dr. M. Paramasivam, RRS, APK Dr. R. Akila, AP (Pl. Path.)	<ul style="list-style-type: none"> • Av. weight of single sporophore (g) • Total yield (kg/ kg substrate) • (Spawn will be supplied by CBE and MDU centres by third week of August,2023) 	
Action plan 9 Management of major diseases of onion	Theme leader: Dr. R. Akila, Assoc. Prof. (Plant Patho.), RRS, Aruppukottai Dr. R. Thilagavathy, Asst. Prof. (Pl. Patho.), AC&RI, Kudumiyamalai Dr. K. Kalpana, Assoc. Prof. (Pl. Patho.), HC&RI, Periyakulam	Treatment Details T1-Bulb treatment with <i>Trichoderma asperellum</i> (50 g/kg +Soil application of <i>T. asperellum</i> (2.5 kg/ha) T2-Bulb treatment with <i>Bacillus subtilis</i> (Bbv57) + Soil application of <i>B. subtilis</i> (2.5 kg/ha) + Foliar spray of <i>B. subtilis</i> (0.5%) T3-Soil application of neem cake (100 Kg/acre) + Foliarapplication of NSKE (5%) T4-Bulb treatment, Soil drenching (0.2 %) and spraying with Carbendazim + Mancozeb (0.1 %) T5-Bulb treatment, Soil drenching and spraying with Tebuconazole (0.1%) T6-Control Observations to be recorded PDI (Foliar diseases) Percent Incidence (Bulb rot) Yield Number of bulbs/ bunch Bulb diameter	Suitable fungicide for the management Effect of bio control agents and neem products on the diseases and plant growth attributes
Action plan 10 Identification of sources of resistance against root knot nematode, <i>Meloidogyne incognita</i> in vegetable crops (Cont..)	HC&RI, Periyakulam Dr. K. Senthamizh TNAU, Coimbatore Dr. S. Prabhu Dr. I. Cannayane AC&RI, Eachangkottai Dr. M. Shanmugapriya	Confirmation of resistance against root knot nematode, <i>M. incognita</i> in vegetable crops, chillies and brinjal	Nematode resistant sources will be identified
Action plan 11 Management of root knot nematode, <i>Meloidogyne incognita</i> in Bhendi using EC formulation of <i>Xenorhabdus</i> toxin	AC&RI, TNAU, Coimbatore Dr. S. Prabhu Dr. N. Seenivasan AC & RI, Eachangkottai Dr. M. Shanmugapriya AC & RI, Vazhavachanur Dr. P. Senthil Kumar HC &RI, Periyakulam	Evaluation of <i>Xenorhabdus</i> toxin formulation (Xenotox 80EC) for the management of root knot nematode, <i>Meloidogyne incognita</i> in Bhendi Treatment details T ₁ - Soil application of Xenotox 80EC @ 2ml /litre T ₂ - Soil application of Xenotox 80EC @ 5ml /litre T ₃ - Carbofuran 3G @ 1kg a.i./ha T ₄ - Fluensulfone 2% GR @ 25kg/ha	New bio formulation made available for the management of root knot nematode in Bhendi

	Dr. K. Senthamizh	T ₅ - Untreated control Observations to be recorded <ul style="list-style-type: none"> ➤ Initial and final nematode population in soil ➤ Root Gall index ➤ No of females/5g of root ➤ Yield and CB ratio 	
Action plan 12 Management of root knot nematode, <i>Meloidogyne incognita</i> in brinjal using botanicals (Cont.)	AC&RI, Coimbatore Dr. P.G. Kavitha Dr. T. Elaiyabharathi AC&RI, Eachangkottai Dr. M. Shanmugapiya Dr. V. G. Mathirajan AC & RI, Vazhavachanur Dr. P. Senthil Kumar Dr. P. Yasodha	Evaluation of leaf powder and oil cake formulations for the management of root knot nematode, <i>Meloidogyne incognita</i> and ash weevil <i>Mylocerus subfasciatus</i> in Brinjal Treatment details T ₁ - Soil application of <i>S. glauca</i> leaf powder @ 14kg /ha T ₂ - Soil application of <i>S. glauca</i> oil cake @ 35 kg/ha T ₃ -Soil application of neem cake @250 kg/ha T ₄ - Soil application of <i>Pochonia chlamydosporia</i> + <i>Metarhizium anisoplia</i> @ 2.5 kg/ha (each) T ₅ - Carbofuran 3G @ 33 Kg / ha T ₆ - Untreated control Observations to be recorded <ul style="list-style-type: none"> ➤ Initial and final nematode population in soil and roots ➤ Root knot gall index ➤ Number of grubs in the root zone ➤ Percent incidence of ash weevils ➤ Yield and CB ratio 	Development of management for nematodes and ash weevils in Brinjal
Action plan 13 Development of organic management practices for pests, diseases and nematode management in carrot	Dr. L. Rajendran, HRS, Ooty Dr. B. Vinothkumar, HRS, Ooty Dr. B. Anita, TNAU, Coimbatore	Treatment details T1 – Control T2 - Farmers practice (Spraying of Mancozeb @ 2ml/l, Quinalphos 25 EC @ 2 ml/l) T3 - Organic package a. Bio-fumigation with mustard before sowing b. Basal application of <i>Metarhizium anisopliae</i> + <i>Trichoderma viride</i> + <i>Bacillus subtilis</i> + <i>Purpureocillium lilacinum</i> each 1 kg along with neem cake 400 kg/ acre c. Sowing marigold as border crop d. Spraying neem oil @ 3% at 30 DAS + yellow sticky trap @ 12/acre	Development of organic management practices for pests, diseases and nematodes

		<p>e. Application of <i>Metarhizium anisopliae</i> + <i>Trichoderma viride</i> + <i>Bacillus subtilis</i> + <i>Purpureocillium lilacinum</i> each 1 kg along with vermicompost 400 kg/acre at 45 DAS</p> <p>f. Application of <i>Metarhizium anisopliae</i> + <i>Trichoderma viride</i> + <i>Bacillus subtilis</i> + <i>Purpureocillium lilacinum</i> each 1 kg along with vermicompost 400 kg/acre at 60 DAS</p> <p>Design: RBD; Replication: Seven</p> <p>Observations to be recorded</p> <p>Disease incidence</p> <p>Pest infestation</p> <p>Nematode infestation</p> <p>Yield/ac; C:B ratio</p>	
<p>Action plan 14 BIPM module for the management of brinjal shoot and fruit borer</p>	<p>Dr S. Jeyerajan Nelson (TL) Dr. S. Elenchezuhian, ACRI, KKM Dr. Zadda Kavitha, AC&RI, Madurai Dr. K. Rajabaskar, KVK, Dharmapuri</p>	<p>T1- BIPM Module: Installation of Pheromone traps @ 5/acre 8 releases of <i>Trichogramma pretiosum</i> after 50 DAP (@10 days interval) 2 releases of <i>Chrysoperla zastrowii sillemii</i> @400 eggs/acre from 50 DAP (at 10 days interval) T2- Farmer's Practise T3- Control</p>	<p>Development of BIPM module for brinjal shoot and fruit borer</p>
<p>III. Spices and Plantation Crops</p>			
<p>Action plan 1 Monitoring Diseases of spices and plantation crops</p>	<p>Theme Leader: Dr. S. Maruthasalam, TNAU, Coimbatore Dr. S. Sundaravadana, ARS, BSR Dr. P. Latha, CRS, Aliyar Nagar Dr. M. Surulirajan, CRS, VPM</p>	<ul style="list-style-type: none"> Monitoring of diseases of spices and plantation crops through Roving survey and fixed plot survey at fort nightly intervals in the identified district Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets. Submission of high-quality photos (500 numbers) to the lead centre for AI. Reporting outbreak of diseases to DCPPS Monthly pest monitoring report to the Government and other stakeholders 	<ul style="list-style-type: none"> Disease status of fruit crops and Monthly disease monitoring report Bulletin by the Team of Scientists
<p>Action plan 2 Management of basal stem rot in coconut</p>	<p>Theme Leader: Dr. S. Maruthasalam, TNAU, Coimbatore Dr. P. Latha, CRS, Aliyar Nagar Dr. K. Kavitha, KVK, Thirupathisaram</p>	<p>Treatments</p> <p>T₁: Soil application of coconut consortia @ 5 litre/acre + VAM @ 100 g/palm at 3 month intervals + recommended dose of fertilizers.</p> <p>T₂: Coconut consortia @ 5 litre/acre + root feeding with hexaconazole (2 ml/palm) mixed with 100 ml water at 3 month intervals + recommended dose of fertilizers.</p>	<p>Management strategy for basal stem rot will be available</p>

	Dr. M. Surulirajan, CRS, Veppankulam	T ₃ : Farmers practice T ₄ : Control Treatment details Design: RBD No. of Replications: 7 No. of palms per replication: 10 (minimum) Observations to be recorded 1. BSR disease severity using standard score chart 2. Coconut yield (Nuts /harvest) and C:B ratio	
Action plan 3 Management of root wilt disease of coconut	Theme Leader: Dr. G. Karthikeyan & Dr. S. Maruthasalam, TNAU, Coimbatore Dr. P. Latha, CRS, Aliyar Nagar Dr. K. Kavitha, KVK, Thirupathisaram Dr. N. Rajinimala, ARS, Ambasamudram	T ₁ : Recommended dose of fertilizers & micronutrients + Soil application of microbial consortia & Bio-fertilizers + root feeding with coconut tonic + crown application of hexaconazole (2 ml + 300 ml water) + "TNAU COCOCON" application (at 2-months interval). T ₂ : Recommended dose of fertilizers T ₃ : Control Treatment details Design: RBD; No. of Replications: 7 No. of Palms per replication: 10 (minimum) Observations to be recorded 1. Root wilt incidence and severity (using the scale) 2. Leaves: Nutrients (N, P, K) concentration and micronutrients 3. Soil (rhizosphere and bulk) 4. pH 5. Electrical conductivity 6. Organic carbon 7. Available macronutrients coconut yield (Nuts / harvest) and C:B ratio	
IV. Flowers, Medicinal & Aromatic Crops			
Action plan 1 Monitoring Insect Pests of flower Crops	Dr. K. Sasikumar, HC&RI, Jeenu (TL) Dr. D. Rajabaskar, KVK, Dharmapuri Dr. M. Senthilkumar, HRS, YCD Dr. B. Vinothkumar, KVK, Ooty	<ul style="list-style-type: none"> Monitoring of insect pests of flower crops through Roving survey @ fortnightly intervals in the identified district Depositing preserved samples of newer categories of insects with the TNAU Insect Biodiversity Laboratory for documentation and cataloguing Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets immediately. Submission of high-quality photos (500 numbers) to the Theme Leader for preparation of Bulletin 	Pest status of horticultural crops Monthly pest monitoring report Bulletin by the Team of Scientists

		<ul style="list-style-type: none"> • Reporting outbreak of pests to DCPPS • Monthly pest monitoring report to the Government and other stakeholders 	
Action plan 2 Monitoring Diseases of Medicinal and Flower Crops	Dr. P. Renuka devi, DMAC, TNAU, CBE (TL); Dr. I. Yesu Raja, AC&RI, Madurai DR. L. Rajendran, HRS, Ooty Dr. M. Deivamani, KVK, Dharmapuri	<ul style="list-style-type: none"> • Monitoring of diseases of medicinal and flower crops through Roving survey and fixed plot survey at fort nightly intervals in the identified district • Uploading the data in CPPS Pest and Diseases Monitoring Google Sheets. • Submission of high-quality photos (500 numbers) to the lead centre for AI • Reporting outbreak of diseases to DCPPS • Monthly pest monitoring report to the Government and other stakeholders 	<ul style="list-style-type: none"> • Disease status of fruit crops and Monthly disease monitoring report • Bulletin by the Team of Scientists
Action plan 3 Monitoring of Nematode infection in horticultural crops	KVK, Pongalur Dr. P. Kalaiarasan (TL) KVK, Vridhachalam Dr. J. Jayakumar KVK, Vamban T. Senthilkumar TNAU, Coimbatore Dr. N. Swarnakumari Dr. S. Prabhu AC&RI, Eachangkottai Dr. M. Shanmugapriya HC &RI, Periyakulam Dr. K. Senthamizh AC & RI, Vazhavachanur Dr. P. Senthil Kumar	Conducting survey and submission of nematode analysis report on or before 25 th of every month to the Professor and Head, Department of Nematology, TNAU, Coimbatore	Diagnoses of nematode diseases in Horticultural crops will be delivered

C. REMARKS ON THE RESEARCH PROJECTS			
S. No.	Project details	Project Investigator and Centre	Remarks
I. FRUIT CROPS			
1.	CPPS/PKM/ENT/FRU/2020/001 Population dynamics and management of borer pest complex of sapota using chemicals and bio agents Period: November 2019 to October 2022	Dr. C. Muthiah, Professor and Head HC&RI, Periyakulam	Completion report may be submitted on or before 30.07.23
2.	CPPS/TRY/ENT/FRU/2020/002 Development of cost effective and eco-friendly IPM strategies for the management of fruit fly, <i>Bactrocera</i> spp. in mango ecosystem Period: October 2020 to September 2023	Dr. A. Kalyanasundaram, Prof. (Entomology) ADAC&RI, Tiruchirappalli	Project may be continued
3.	CPPS/MDU/ENT/FRU/2020/001 Developing formulation based on the fruit extract of <i>Citrullus colocynthis</i> L. for the management of mite pests	Dr. C. Chinniah, Prof. (Retd.) (Sep. 2020 to May 2021) Dr. M. Shanthi (June 2021- May 2022), Director (CPPS) Dr. Zadda Kavitha (Sep. 2022 to till date), Assoc. Prof. (Agrl. Ento.) Dr. K. Senthil, Assoc. Prof. (Agricultural Chemicals)	Project may be continued and the formulation may be developed early
4.	CPPS/PKM/FRU/HOR/2023/001 Study on pests and natural enemies spectrum in Jamun Period: January 2023- December 2024	Dr. S. Suganya Kanna Assoc. Prof. (Ento.) Department of Fruit Science HC & RI, Periakulam Dr. C. Vijayaraghavan Assoc. Prof. (Ento.) CRS, Srivilliputhur Dr. Ga. Dheebakaran Assoc. Prof. (Agronomy) ACRC, TNAU, Coimbatore	Project may be continued
5.	New: Exploration of <i>Metarhizium anisopliae</i> against cashew stem and root borer, <i>Plocaederus ferrugineus</i> under Laboratory and field condition	Dr. K. Senguttuvan Asst. Prof. (Agrl. Entomology) KVK, Vridhachalam Dr. V. Sendhilvel Assoc. Prof. (Patho.) KVK, Vrinjipuram	Project may be continued
PATHOLOGY			
6.	CPPS/CBE/PAT/FRU/2020/001. Banana endophyte mediated induction of in planta resistance against Fusarium wilt of banana Period: January 2020–Dec 2023	Dr. S. Nakkeeran, Prof. (Pl. Path.) TNAU, Coimbatore	Project may be continued
7.	CPPS/CBE/PAT/FRU/2017/001. Evaluation and testing of Mahaffee spore trap for the detection of air borne inocula of grapevine mildews Period: September, 2017 to August 2021	Dr. A. Kamalakannan, Prof. (Pl. Path.) TNAU, Coimbatore	Completion report to be submitted on or before 30.07.23
8.	CPPS/CBE/PAT/FRU/2021/001	Dr. S. Vanitha Professor (Plant Pathology), TNAU, Coimbatore	Project may be continued

	Management of powdery mildew disease in Grapes (<i>Vitis vinifera</i>) using endophytic microorganisms and botanicals Period: January 2021 to December 2024		
9.	CPPS/MDU/PAT/FRU/2020/001 Management of post harvest disease of mango anthracnose caused by <i>Colletotrichum gloeosporioides</i> Period: Sep 2019 to May 2022	Dr. M. Theradimani, Dean AC&RI, Killikulam	Completion report may be submitted on or before 30.07.23
10.	CPPS/CBE/DFS/HOR/2021/001 Diagnosis, characterization and management of bacterial crown rot of Papaya. Period: August 2021-July 2024	Dr. S.K. Manoranjitham, Professor (Pl. Path.) TNAU, Coimbatore	Project may be continued
11.	CPPS/MDU/PAT/FRU/2020/002 Development of microbial formulation, a component of IDM package for Citrus Greening Disease (CGD) Period: Sept, 2020-Aug, 2023	Dr. K. Manonmani, Assoc. Prof. (Pl. Path.) Dr. Zadda Kavitha, Asoc. Professor (Ag. Ento)	Project may be continued
EXTERNALLY FUNDED PROJECTS			
	DST/SERB/MDU/PAT/2022/R001 Citrus Microbiome Mediated Pathogen Control and Nutrient Availability on Mitigating the Impact of Citrus Greening Disease for Sustaining the Citrus Health Period: Feb 2022-Jan 2025	Dr. K. Manonmani Assoc. Prof. (Plant Pathology) AC&RI, Chettinad	Project may be continued
13.	CPPS/PAT/ERDF/202/L001 Development of microbial consortium for managing Citrus Greening Disease Period: Dec 2021-Nov 2023	Dr. K. Manonmani Assoc. Prof. (Plant Pathology) AC&RI, Chettinad	Project may be continued
NEMATOTOLOGY			
14.	CPPS/CBE/NEM/ FRU/2021/001: Evaluation of turmeric leaf waste against lesion forming nematodes in banana (July 2021-June 2024)	Dr. N. Seenivasan Professor (Nematology), TNAU, Coimbatore	Project may be continued
15.	CPPS/CBE/NEM/ FRU/2021/002: Evaluation of bacterial endosymbionts against root lesion nematodes, <i>Pratylenchus coffeae</i> and <i>Radopholus similis</i> in banana. Jan. 2021-Dec. 2023	Dr. P. Vetrivelkai Assoc. Prof. (Nematology) HC & RI (W), Trichy	Project may be continued
II. VEGETABLES			
1.	CPPS/CBE/ENT/VEG/2020/002 Developing a bio-intensive module for the management of tomato pinworm, <i>Tuta absoluta</i> Meyrick (Lepidoptera: Gelechiidae) Period: Sept. 2020–Aug. 2022	Dr. S. Jeyarani, Prof. (Ento.) AC & RI, Kudimiyamalai	Completion report and new project may be proposed on or before 30.07.2023
2.	CPPS/CBE/ENT/VEG/2020/001 Development of eco-friendly IPM module for the management of sucking pests complex of capsicum under protected cultivation. Period: April 2021 to Mar. 2022	Dr. T. Elaiyabharathi, Assoc. Prof. (Ento.), TNAU, Coimbatore	Completion report and new project may be proposed on or before 30.7.2023
3.	CPPS/YTP/ENT//2021/001	Dr. P.A. Saravanan, Assoc. Prof. (Ento.), TCRS, Yethapur	Completion report and new project

	Population dynamics of mealybug species and its natural enemies in cassava Period: April, 2021 to March 2023		may be proposed on or before 30.07.2023
4.	CPPS/CBE/ENT/2021/012. Dissipation pattern of chlorantraniliprole and thiamethoxam in Curry leaf Period: July, 2020 - July 2022	Dr. K. Bhuvaneshwari, Prof. (Ento.), TNAU, CBE	Completion report and new project may be proposed on or before 30.07.2023
PATHOLOGY			
6.	CPPS/CBE/PAT/VEG/2021/001. Exploring <i>Bacillus</i> spp. for the management of Peanut bud necrosis virus in tomato Period: March 2021 to Feb. 2024	Dr. S. Harish, Assoc. Prof. (Pl. Path) Dept. of Plant Pathology, TNAU, Coimbatore	Project may be continued
7.	CPPS/CBE/PAT/FRU/2020/002. Survey and Management of bacterial wilt (<i>Ralstonia solanacearum</i>) in tomato Period: Jan, 2020 to Dec, 2022	Dr. M. Karthikeyan, Assoc. Prof. (Pl. Path), Dept. of Veg. Science, TNAU, Coimbatore	Completion report and new project may be proposed on or before 30.7.2023
8.	CPPS/CBE/PAT/VEG/2020/001 Management of Postharvest Spoilage of tomato through alternative methods. Period: September 2019 to August 2022	Dr. V.K. Parthiban, Prof. (Pl. Path.) Dept. of Plant Pathology, TNAU, Coimbatore	Completion report and new project may be proposed on or before 30.7.2023
9.	CPBG/KDM/PAT/VEG/2021/002. Studies on the incidence of brinjal little leaf caused by Candidatus Phytoplasma trifolii and its integrated management. Period: 2021 to 2023	Dr. A. Vijayasamundeeswari, Assoc. Prof. (Pl. Path.), Dept. of Crop Protection, AC&RI, Kudumiyamalai	Completion report and new project may be proposed on or before 30.7.2023
10.	CPPS/MDU/PAT/VEG/2020/001 Exploration of Ashwagandha for the management of chilli anthracnose Period: May 2020- June 2023	Dr. P. Mareeswari, Prof. (Pl. Path), Dept. of Plant Pathology, AC& RI, Madurai	Completion report and new project may be proposed on or before 30.7.2023
11.	CPPS/RMD/PAT/VEG/2019/001 Survey and management of anthracnose disease of mundu chilli caused by <i>Colletotrichum capsici</i> in Ramanathapuram dt. Period: November 2019 to Oct. 2022	Dr. I. Yesu Raja, Prof. (Plant Pathology), AC&RI, TNAU, Killikulam	Completion report and new project may be proposed on or before 30.7.2023
12.	CPPS/MDU/PATH/HOR/2022/001 Exploring the effect of endophytes agonists viruses infecting water melon (<i>Citrullus lanatus</i>). Period: April 2022– March 2025	Dr. K. Kalpana, Assoc. Prof. (Plant Pathology), Dept. of Plant Pathology, AC&RI, TNAU, Madurai	Project may be continued
13.	CPPS/APK/PAT/VEG/2020/001 Management of twister blight disease of onion in rainfed areas of Virudhunagar district. Period: August 2020 - March 2023	Dr. R. Akila, Assoc. Prof. (Plant Pathology), RRS, Aruppukottai	Completion report and new project may be proposed on or before 30.7.2023
14.	CPPS/MDU/PAT/VEG/2020/001 Exploring <i>Trichoderma</i> spp. and <i>Bacillus</i> spp. for the management of basal rot (<i>Fusarium oxysporum</i> f.sp. <i>cepae</i>) of onion Period: July 2020 to June 2023	Dr. S. Thiruvudainambi, Professor (Plant Pathology), AC&RI, Madurai	Completion report and new project may be proposed on or before 30.7.2023
15.	CPPS/TRY/PAT/VEG/2020/001 Integrated management of onion downy mildew disease Period: October 2019 to September 2022	Dr. R. Thilagavathi, Asst. Prof. (Pl. Path.), Dept. of Plant Protection, HC&RI (W), Trichy	Completion report and new project may be proposed on or before 30.7.2023

16.	CPPS/YTP/PAT/TUB/2018/001 Integrated management of cassava mosaic disease in tapioca Period: October, 2018 to September, 2021	Dr.N. Indra, Assoc. Prof. (Pl. Pathology) Dr. P. S. Kavitha, Assoc. Prof. (Horti.) TCRS, Yethapur	Completion report and new project may be proposed on or before 30.7.2023
17.	CPPS/CBE/PAT/Mush/2021/004 Collection and Evaluation of antibacterial Ascomycetes and Basidiomycetes wild fungi from Western Ghtas Period: July 2020 to June 2023	Dr.V. Paranidharan, Professor (Pl. Path.), TNAU, Coimbatore	Completion report and new project may be proposed on or before 30.7.2023
18.	CPPS/KDM/PAT/MUS/2019/001 Collection and identification of edible mushroom species from natural habitat of Gaja cyclone affected areas of Pudukkottai district and assessing their edibility Period: June 2019 to May 2022	Dr. N. Revathy, Professor (Plant Pathology), AC&RI, Madurai	Completion report and new project may be proposed on or before 30.7.2023
19.	CPPS/KKM/PAT/MUS/2020/001 Development of short duration, Temperature tolerant and High Yielding elite Pleurotus mushroom Period: July 2020 to June 2023	Dr. M. Paramasivam, Assoc. Prof. (Pl. Pathology), AC&RI, Killikulam	Completion report and new project may be proposed on or before 30.7.2023
20.	CPPS/MDU/PAT/Non/2021/001 Assessment of high yielding strains of milky mushroom and standardization of cultivation techniques for promising strain Period: Sept, 2020 – Aug, 2022	Dr. K. Manonmani, Assoc. Prof. (Pl. Pathology), AC&RI, Madurai	Completion report and new project may be proposed on or before 30.7.2023
EXTERNALLY FUNDED PROJECTS			
21.	DST-SERB/ CPPS/ CBE/PAT /2021/ R001. Expression of artificial microRNAs targeting the replicase gene for conferring resistance against Peanut bud necrosis virus in tomato. Period: Mar. 2021 to Mar. 2024	Dr. S. Harish, Assoc. Prof., Dept. of Plant Path., TNAU, Coimbatore	Project may be continued
22.	DST-SERB / CPPS / PATH / 2022 / R001. Pathogenomics of emerging whitefly transmitted begomoviruses of cucurbitaceous crops in Tamil Nadu: Characterization of ecologically diverse begomoviruses and population dynamics of whitefly biotypes in virus transmission Period: January 2022 to December 2024	Dr. G. Karthikeyan, Prof. & Head, Dept. of Plant Path., TNAU, Coimbatore	Project may be continued
NEMATOTOLOGY			
23.	CPPS/CBE/NEM/HOR-001. Development of soluble concentrate formulation of egg parasitic fungi, <i>Pochonia chlamydosporia</i> and <i>Purpureocillium lilacinum</i> against <i>Meloidogyne</i> spp. (January, 2022 to December 2024)	Dr. N. Swarnakumari, Assoc. Prof. (Nematology) Dept. of Nematology, TNAU, Cbe	Project may be continued
24.	CPPS/ CBE/ NEM/ HOR/002. Influence of abiotic factors on the biocontrol potential of nematophagous fungus, <i>Clonostachys rosea</i> (TNAU CR 01) on root	Dr. G. Jothi, Prof. (Nematology) Dept. of Nematology, TNAU, Cbe	Project may be continued

	knot nematode in bitter gourd. (January 2022 to December 2024)		
25.	CPPS/PKM/NEM/VEG/2020/001. Management of root knot nematode in vegetables using plant products. (April 2020 – September 2023)	Dr. S. Prabhu, Assoc. Prof. (Nematology), Dept. of Nematology, TNAU, Coimbatore	Project may be continued
III. SPICES AND PLANTATION CROPS			
1.	PPS/PKM/ENT/SPC/2020/001 Biological silica nanoparticles for the management of cigarette beetle, <i>Lasioderma serricorne</i> (F.) in stored coriander seeds. (July, 2020 – Dec., 2023)	Dr. M. Kannan, Assoc. Prof. (Agrl. Entomology), Dept. of Agrl. Entomology	Completion report may be submitted on or before 30.07.23
2.	BLACK PEPPER		
3.	CPPS/YCD/ENT/BLP/2021/001 Bioecology, population dynamics of sucking pest complex in black pepper in relation to weather factors and its management (May 2021 - April 2023)	Dr. M. Senthil Kumar, Assoc. Prof. (Ento.) HRS, Yercaud.	Completion report and new project may be proposed on or before 30.07.23
PATHOLOGY			
4.	CPPS/BSR/TRC/HOR/2023/001 Effect of application of salicylic acid on leaf spot (<i>Collectotrichum capsici</i>), leaf blotch (<i>Taphrina maculans</i>) severity and curcuminoid accumulation in turmeric (<i>Curcuma longa</i> L.) (Jan. 2023 – Dec. 2025)	Dr. S. Sundravadana, Assoc. Prof. (Plant Pathology), Turmeric Research Centre, Bhavanisagar	Deletion proposal may be submitted
5.	CPPS/ALR/PAT/CNT/2020/001 Development of integrated disease management strategy for bud rot in coconut (Jan. 2020 – Dec. 2022)	Dr. P. Latha, Assoc. Prof. (Plant Pathology), CRS, ALR	Completion report and new project may be proposed on or before 30.7.2023
6.	CPPS/VPK/HOR/2023/001 Development of IDM strategy for basal stem rot disease of coconut in basal stem rot endemic areas of Tamil Nadu (Mar. 2023 – Mar. 2025)	Dr.M. Surulirajan, Asst. Prof. (Plant Pathology), CRS, Veppankulam.	Project may be continued
7.	CPPS/VPK/HOR/2023/002 Management of bud rot disease in coconut nursery through bio-control (Mar. 2023 – Mar. 2025)	Dr.M. Surulirajan, Asst. Prof. (Plant Pathology), CRS, Veppankulam	Project may be continued
NEMATODOLOGY			
8.	CPPS/TRY/NEM/2021/001 Eco-friendly management of betelvine nematodes (July 2021-June 2024)	Dr.J. Jayakumar, Assoc. Prof. (Nematology) KVK, Vridhachalam	To be continued
IV. FLOWERS, MEDICINAL & AROMATIC CROPS			
1.	CPPS/TRY/ENT/FLO/2020/001 Bio-suppression of mealybugs in flower crops. Period: July 2020 to June 2023	Dr. G. Preetha, Assoc. Prof. (Ento.), Dept. of Agrl. Entomology, TNAU	Project may be continued
2.	CPPS/TRY/ENT/FLO/2020/001 Insecticide Resistant Management of Jasmine bud worm, <i>Hendecasis duplifascialis</i> in Tamil Nadu Period: December 2019 to May 2022	Dr. R.P. Soundararajan, Prof. (Ento.), COE, TNAU Dr. K. Ganesan, Assoc. Prof. (Ento.), ARS, Bhavanisagar	Completion report and new project may be proposed on or before 30.7.2023

PATHOLOGY			
1.	CPPS/CBE/PATH/HOR/2022/001- Evolving IDM Strategies for the management of foliar and soil borne diseases of jasmine. Period: Jan 2022- Dec 2024	Dr. P. Muthulakshmi, Professor (Plant Pathology), CSW, TNAU, Coimbatore	Project may be continued
2.	CPPS/MDU/PATH/HOR/2022/002. M anagement of leaf spot of tuberose by biocontrol agents and seaweeds. June 2022-May 2024	Dr. P. Mahalakshmi Asst. Prof. (Plant Pathology), Dept. of Plant Pathology, TNAU, Coimbatore	Project may be continued
3.	CPPS/ VNR/ CPS/ FLO/ 2021/ 001- Management major foliar diseases of tuberose. Period: April 2021-March 2024	Dr. M. Karthikeyan, Assoc. Prof. (Plant Pathology), AC&RI, Vazhavachanur	Project may be continued
4.	CPPS/TRY/CP/HOR/2023/001 “Intera ction and management of Fusarium and Root knot nematode complex in Ixora under sodic soil conditions. Period: Jan’ 2023 to Dec’ 2025	Dr. M. Devanathan, Prof. & Head (Plant Pathology), HC&RI (W), Trichy	Project may be continued
5.	CPPS/CBE/PAT/HOR/2022/001- Investigations on viral diseases affecting <i>Gloriosa superba</i> L. Period: July 2022- June 2025	Dr. P. Renukadevi, Prof. (Pl. Pathology), HC&RI, DMAC, TNAU, Coimbatore	Project may be continued
EXTERNALLY FUNDED PROJECTS			
6.	NMPB/CPPS/CBE/PAT/2018/R019- Investigation on conduciveness of aflatoxin development in Indian Senna and its biological management Period: Oct.2018- March-2023	Dr. V. Paranidharan, Professor, (Plant Pathology), Dept. of Millets, TNAU, CBE	Completion report may be submitted
7.	NMPB/CPPS/CBE/PAT/2022/R001 Development of microbial consortia to mitigate the soil-borne pathogens problem in glory lily. Period: April 2022 - March 2025	Dr. M. Karthikeyan, Assoc. Prof. (Plant Pathology), AC & RI, Vazhavachanur	Project may be continued

VII. REMARKS

a. General recommendations

- Suitable action plan may be formulated for the development of varieties in horticultural crops applying bio-technological tools (**Action:** Dean HC&RI, CBE & PKM/ DCPMB&B).
- Efforts may be taken to engage Diploma holders for maintaining nurseries (**Action:** Dean HC&RI, CBE/PKM/TRY)
- Efforts may be taken to standardize HDP in other horticultural crops (**Action:** Dean HC&RI, CBE/PKM/TRY)
- Drip irrigation / fertigation schedule for major horticultural crops may be standardized (**Action:** Dean HC&RI, CBE & PKM/DNRM/DCWGS)
- Efforts may be taken to strengthen the seed production programme of vegetable crops at HRS, Ooty (**Action:** Dean HC&RI, CBE)

- Efforts may be taken to introduce Non-traditional and exotic horticultural crops wherever possible and data on introduced crops may be collected and documented (**Action:** Dean HC&RI, CBE/PKM/TRY)
- All the Horticultural scientists may be motivated to attract external funding schemes. Progress may be monitored regularly (**Action:** All Scientists).
- Scientists may be encouraged to publish their research findings in the peer reviewed journals having NAAS rating more than 7 (**Action:** All Scientists).

b. Fruit Crops

- Efforts may be taken to intensify research on post harvest management and value addition in fruit crops (**Action:** Dean HC&RI, CBE/PKM/TRY)
- Demonstration plot on mango high density planting with choice varieties may be established in colleges, research stations and KVKs of mango cultivating region (**Action:** Dean HC&RI, CBE/PKM/TRY & DEE)
- Research work on developing PRSV tolerant/ resistant papaya varieties may be intensified (**Action:** Dean HC&RI, CBE)
- Efforts may be taken to record month-wise, flowering, yield and quality parameters in the off-season mango genotypes (**Action:** Dean HC&RI, PKM)
- Research on development of guava varieties tolerant to salt, wilt and nematode complex may be intensified. (**Action:** Dean HC&RI, Coimbatore, HC&RI(W), Trichy/DCPPS)
- Efforts may be taken to develop small size jack fruits (**Action:** Dean HC&RI, PKM P&H, VRS, Palur)
- Bagging technique in mango and guava may be standardized for yield and quality improvement (**Action:** Dean HC&RI, CBE/PKM)
- Research on evolving annona variety with less seed size and more flesh content may be strengthened (**Action:** P&H RRS, Aruppukottai)

c. Vegetable Crops

- Necessary action may be taken to send notification proposals for the released varieties (Lab lab CO 16, Elephant Foot Yam CO 1, Ridge gourd MDU 1) (**Action:** Dean HC&RI, CBE/AC&RI, Madurai)
- Efforts may be taken to popularize the grafting technique of Tomato and Moringa through demonstrations (**Action:** Dean HC&RI, CBE/PKM/DEE)
- Efforts may be taken to intensify research on post harvest management and value addition in vegetable crops (**Action:** Dean HC&RI, CBE/PKM/TRY)
- Ensuring supply of seeds of released varieties of vegetable crops (**Action:** Dean HC&RI, CBE/PKM)
- Research on development of *Midhi pagal* may be initiated and justification for its importance may be provided (**Action:** Dean HC&RI, PKM)

d. Spices and Plantation Crops

- Research on development of fragrant coconut types may be initiated (**Action:** P&H CRS, Aliyar Nagar).
- Performance evaluation of black pepper grafted plants may be studied (**Action:** P&H HRS, Thadiyankudisai).
- Efforts may be taken to address the issues of red palm weevil and root wilt in coconut (**Action:** Dean HC&RI, CBE/DCPPS)
- High value compounds present in important spices may be identified and documented (**Action:** P&H HRS, Pechiparai, HRS, Thadiyankudisai, HRS, Ooty, TRC, Bhavanisagar & DSPC, Coimbatore)
- Efforts may be taken to collect Saffron genotypes from Kashmir and evaluated (**Action:** Dean HC&RI, CBE)

e. Floriculture and Landscape Architecture

- Large scale demonstration of *J. multiflorum* var. CO 1 may be conducted jointly with the Dept. of Horticulture and supply of planting material of CO 1 may be ensured (**Action:** P&H DFLA, CBE)
- Efforts may be taken to improve the fragrance in *Margazhi malligai* through Genome editing/MAS (**Action:** Dean HC&RI, CBE/DCPMB&B)
- Minimum descriptor standards for vegetatively propagated flower crops may be developed and documented (**Action:** Dean HC&RI, CBE/PKM)

f. Medicinal and Aromatic Crops

- Research on biochemical analysis of compounds present in medicinal crops may be carried out (**Action:** P&H, DMAC, CBE/PKM/TRY)
- Research to fulfil the requirements of industrial applications in medicinal and aromatic crops may be strengthened (**Action:** P&H, DMAC, CBE/PKM/TRY)
- Efforts may be taken to intensify research on *Gloriosa* (**Action:** **Action:** P&H, DMAC, CBE/PKM/TRY)

g. Crop Protection

- Efforts may be taken to develop pest management packages for major pests for organic cultivation of important horticultural crops (**Action:** Dean HC&RI, CBE/PKM/DCPPS).
- Documentation of residues in fruits and vegetables and strategies to minimize MRL

VIII. List of Participants (offline)

S. No.	Name	Designation and Department
1.	Dr. P. Irene Vethamoni	Dean (Horticulture), HC&RI, TNAU, Coimbatore
2.	Dr. N. Senthil	Director, CPMB&B, TNAU, Coimbatore
3.	Dr. P.P. Murugan	Director of Extension Education, Coimbatore
4.	Dr. M. Shanthi	Director, CPPS, TNAU, Coimbatore
5.	Dr. K. Venkatesan	Prof. & Head, Dept. of Spices and Plantation Crops, HC&RI, Cbe
6.	Dr. T. Saraswathi	Prof. & Head, Dept. of Medicinal and Aromatic Crops, HC&RI, Cbe
7.	Dr. A. Shanthi	Prof. & Head, Dept. of Nematology, Coimbatore
8.	Dr. S. Jeyarajan Nelson	Prof. & Head, Dept. of Agrl. Entomology, Coimbatore
9.	Dr. I. Muthuvel	Prof. & Head, Dept. of Fruit Science, HC&RI, Coimbatore
10.	Dr. N. Seenivasan	Prof. (Nem), Dept. of Nematology, Coimbatore
11.	Dr. S. Praneetha	Prof. (Horti.), Dept. of Vegetable Science, Coimbatore
12.	Dr. S. Vanitha	Prof. (Pl. Path.), Dept. of Veg. Science, Coimbatore
13.	Dr. C. Babu	Prof. (PBG), Directorate of Research, TNAU, Coimbatore
14.	Dr. N. Balakrishnan	Prof. (Ento.), Directorate of Research, TNAU, Coimbatore
15.	Dr. A. Sankari	Prof. (Horti.), COE, Coimbatore
16.	Dr. P. Renukadevi	Prof. (Path.), DMAC, Coimbatore
17.	Dr. G. Jothi	Prof. (Nem.), Coimbatore
18.	Dr. B. Anitha	Prof. (Nem.), Coimbatore
19.	Dr. J. Auxilia	Prof. (Horti), DOEE, Coimbatore
20.	Dr. R.P. Soundararajan	Prof. (Agrl. Entomology), COE, Coimbatore
21.	Dr. M. Ganga	Prof. (Horti.), Dept. of FLA, HC&RI, Coimbatore
22.	Dr. R. Kannan	Prof. (Pl. Path.), Dept. of Plant Pathology, Coimbatore
23.	Dr. D. Keisar Lourdusamy	Prof. (Horti.), Directorate of Research, TNAU, Coimbatore
24.	Dr. N. Chitra	Prof. (Ento.), Dept. of Cotton, Coimbatore
25.	Dr. P. Muthulakshmi	Prof. (Pl. Path.), CSW, Coimbatore
26.	Dr. G.V. Rajalingam	Prof. (Horti.), HC&RI, Coimbatore
27.	Dr. P.S. Kavitha	Assoc. Prof. (Hort.), NOFRC, Coimbatore
28.	Dr. M. Kavitha	Assoc. Prof. (Horti), Dept. of Veg. Science, Coimbatore
29.	Dr. N. Indra	Assoc. Prof. (Pl. Path.), Dept. of Fruit Science, CBE
30.	Dr. C. Kavitha	Assoc. Prof. (Horti.), Dept. of Fruit Science, Coimbatore
31.	Dr. H. Usha Nandhini Devi	Assoc. Prof. (Horti.), CPHT, Coimbatore
32.	Dr. N. Swarnakumari	Assoc. Prof. (Nem), Coimbatore
33.	Dr. V.P. Santhanakrishnan	Assoc. Prof. (Org. Chemistry), Coimbatore
34.	Dr. S. Prabhu	Assoc. Prof. (Nem), Coimbatore
35.	Dr. S. Maruthasalam	Assoc. Prof. (Pl. Path.), HC&RI, Coimbatore
36.	Dr. G. Preetha	Assoc. Prof. (Ento.), Seed Centre, Coimbatore
37.	Dr. M. Mohanalakshmi	Assoc. Prof. (Horti.), HC&RI, Coimbatore
38.	Dr. R. Chitra	Assoc. Prof. (Horti.), HC&RI, Coimbatore
39.	Dr. P. Malathi	Assoc. Prof. (SS&AC), Coimbatore
40.	Dr. C. Thangamani	Asst. Prof. (Horti.), Dept. of Veg. Science, Coimbatore
41.	Dr. P. Mahalakshmi	Asst. Prof. (Pl. Path.), Coimbatore
42.	Dr. V. Sivakumar	Asst. Prof. (Horti), Dept. of Fruit Science, Coimbatore
43.	Dr. S. Karthikeyan	Asst. Prof. (Horti), HC&RI, Coimbatore
44.	Dr. T. Sumathi	Asst. Prof. (Horti.), HC&RI, Coimbatore
45.	Dr. M. Visalakshi	Asst. Prof. (Horti.), HC&RI, Coimbatore
46.	Dr. K.A. Shanmugasundaram	Asst. Prof. (Horti), Dept. of Fruit Science, Coimbatore
47.	Dr. B.K. Savitha	Asst. Prof. (Horti.), Dept. of Veg. Science, Coimbatore

48.	Dr. S.T. Bini Sundar	Asst. Prof. (Horti.), HC&RI, Coimbatore
49.	Dr. K. Vanitha	Asst. Prof. (CRP), Dept. of Fruit Science, Coimbatore
50.	Dr. P.G. Kavitha	Asst. Prof. (Nem.), O/o. Dean Agri, Coimbatore
51.	Dr. T. Elaiyabharathi	Asst. Prof. (Ento.), HC&RI, Coimbatore
