

TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

38th Rice Scientists' Meet 2019

(April 02-03, 2019)

Lead Centre

Tamil Nadu Rice Research Institute
Aduthurai – 612 101, Thanjavur District

Directorate of Research

Tamil Nadu Agricultural University
Coimbatore 641 003

2019

PROCEEDINGS

38th Rice Scientists' Meet 2019

(April 2-3, 2019)

The 38th Rice Scientists Meet was held during April 2-3, 2019 at the Tamil Nadu Agricultural University, Coimbatore. **Dr. N. Kumar**, Vice Chancellor highlighted the need for the scientists to develop collaborate research projects with a focus on improving the productivity of rice. **Dr. K.S. Subramanian**, Director of Research, welcomed the gathering and briefly presented the achievements and research outcomes for the year 2018-19 from crop improvement, management and protection. Further, he flagged off few researchable issues such as conversion of C3 to C4 photosynthesis, molecular breeding, Digital Agriculture, Endophyte medicated biotic and abiotic stress management, use of botanicals and biocontrol agents in insect pest management and plant health monitoring using artificial intelligence. **Dr. K.R. Ashok**, Director (CARDS) elucidated the current rice production scenarios in India and Tamil Nadu and provided broad perspectives of constraints and strategies to be adopted to sustain the production in pace with burgeoning population. The action taken reports on the 37th Rice Scientists Meets were presented by the lead scientists from Tamil Nadu Rice Research Institute, Aduthurai. During the concurrent sessions, the technical directors had reviewed the on-going university research projects (107), action plan projects (7), core projects (11), AICRPs (2) besides externally funded projects (52). The outcome of the review process was presented by **Dr. S. Geetha**, Director (CPBG), **Dr. V. Geethalakshmi**, Director (Crop Management) and **Dr. K. Prabakar**, Director (CPPS). In the closing remarks, the Vice Chancellor said that the rice scientists should continue to work multi-disciplinary mode to improve the quality of research with a definite technology delivery. He also emphasized that the both plant breeders and seed technologists work together and ensure the maintenance of purity of seeds. Dr. V. Ambethgar, Director, TRRI, Aduthurai, proposed a formal vote of thanks.

The proceedings of the meet is furnished as below

A. CROP IMPROVEMENT

- I. Specific recommendations
- II. General recommendations
- III. Cultures recommended for variety release/OFT/ART/MLT
- IV. Action plan
- V. Project wise remarks

B. CROP MANAGEMENT

- I. Specific recommendations
- II. General recommendations
- III. On Farm Trials
- IV. Action plan
- V. Project wise remarks

C. CROP PROTECTION

- I. Specific recommendations
- II. General recommendations
- III. Action plan
- IV. Project wise remarks

D. CLOSING REMARKS

PARTICIPANTS

A. CROP IMPROVEMENT

I. Specific recommendations

- Germplasm for specific traits may be collected across the country for utilization in breeding programmes especially released varieties from Jammu and Kashmir (Action: Aduthurai and Coimbatore)
- New breeding programmes have to be taken up to improve the region specific land races such as *Motta Kuruva* in Kanyakumari district (Action: Thirupathisaram and Ambasamudram)
- Identification of resistant donors for stem borer by exploiting the hot spot area - Tirupathisaram (Action: CPMB&B, CPPS and Dept. of Rice).
- The performance of hybrid rice may be explored at Vadakavunjivillage in kodaikanal (Action: Coimbatore and Gudalur)
- Priority to be given to develop varieties pyramided with multiple stress tolerance. Collaborative projects between CPBG and CPMB & B may be explored
- The homozygous cultures obtained from different approaches of plant breeding viz., pedigree, MAS or mutation need to undergo yield evaluation in station trials. The cultures with more than 15-20 % yield advantage in station trials against the standard variety alone may be proposed for MLT by the concerned breeder
- The data with trial mean less than 4000 kg/ha and CV more than 15 % will not be considered for assessing genotypic performance.
- The breeders in the research stations should bestow effort to visit ARTs in the respective districts
- The rice variety Anna (R) 4 need to be studied for improvement considering farmers preference.

II. General recommendations

- Efforts need to be bestowed to purify the newly released rice varieties before entering into seed chain
- The MLT data is to be sent along with weather data (monthly basis) for the crop growth period
- MLT Monitoring tours should be performed along with the Plant Protection and Crop Management scientists
- All the nominated new entries for MLT (code with decoded list) must be sent to the Director, CPBG along with sample seeds. (Action: Professor and Head, Crop Improvement, TRRI, Aduthurai)
- The seed materials should be handled very carefully prior to supply to the end user (All Breeders and Seed Technologists)

III . Cultures recommended for submission of variety release.OFT/ART/MLT

a. Cultures recommended for submission of variety release proposals

(SVRC) during 2019-20

1. CB 06803

Parentage	: PMK (R) 3 /Norungan
Duration	: 115-120 days suitable for rainfed tracts of Tamil Nadu
Average yield	: 3,874 kg/ha (Rainfed) 12.7 % over TKM (R) 12 and 13.6 % over Anna (R) 4
Special features	: MR to diseases viz., leaf blast, neck blast, sheath rot, brown spot.Short bold rice with high milling (69.6 %), HRR, (59.6%) suitable for idly making

2. AD 09493

Parentage	: I.W. Ponni / Bansakthi
Duration	: 130-135 days suitable for Thaladi/Late Samba seasons
Average yield	: 6123 kg/ha (9.8 % than BPT 5204 & 11.2 % than ADT 49)
Special features	: Medium slender white rice with LER-1.6 and HRR 60.1 % Moderately resistant to BPH and brown spot

b. Cultures recommended for conducting On Farm Trials during 2019-20

The following cultures had completed two years of ART and therefore recommended for conducting OFTs during 2019-20

Groups	Cultures
Short duration	CB 12588, AD 09219 (Checks: CO 51 & ADT 53)
Rainfed early	TM 12061 (Check: Anna (R) 4)
Medium	CB MAS 14065 (Checks: BPT 5204 and CO 52)

c. Cultures recommended for Adaptive Research Trials (2019-20)

Sufficient quantity of seeds (100kg) of the cultures and checks from the respective centres are to be sent to TRRI, Aduthurai on or before 15th May 2019 for co-ordination of ART

Cultures with Parentage and checks	Yield and Duration	Special attributes	Locations
Rice 4/2019-20: Transplanted (Oct 25 – Nov 10, 110 to 125 days)			
AD 12132 (R) (ADT 39/Konark)	5608 kg/ha in 128 days 19.4 % higher than ADT 39	Moderately resistant to blast and resistant to brown spot LER - 1.64; BER - 1.48 Intermediate amylose	All districts except Virudhunagar, Ramnad, Sivagangai, and The Nilgiris

TP 08053 (R) (ADT 36/ ADT 42) Check: ADT 39	5464 kg/ha in 124 days 16.3 % higher than ADT 39	Long slender Rice LER – 1.49 Intermediate amylose Moderately resistant to blast and sheath rot	
Rice 10/2019-20: Rainfed- Early (Sept.- Oct.)			
TM 12077 (R) (TKM (R) 12 / IET 21620) Check: Anna (R) 4	2777 kg/ha in 120 days under dry condition and 2930 kg/ha under semi dry condition in 122 days % 31.9 % and 3.8 % high yield than Anna (R) 4 under dry and semi dry conditions respectively	Medium Slender	Ramnad, Thiruvallur, Kancheepuram
Rice15/2019-20 : Special transplanted Medium (September-October sowing:125-140 days)			
CB 12132 (R) CO (R) 50 / CB 05501 Checks: CO 52 and TKM 13	6254 kg/ha in 135 days, 15.0 % higher than BPT 5204	Medium slender Resistant to blast, Non lodging, HRR: 60.75%	All districts except Virudhunagar, Ramnad, Sivagangai, and The Nilgiris
Rice18/2019-20: Aromatic slender grain (September – October sowing: 125 – 140 days)			
CB MAS 14142(R) (I.W.Ponni /Apo) Checks:TKM 13 and Pusa Basmati 1	4647 kg/ha in 120 days, 6.2% over Pusa Basmati 1	Long slender grain with good linear elongation ratio. Resistant to Brown spot	Vellore, Dharmapuri, Salem, Erode, Coimbatore, Dindigul, Theni, Karur, Trichy and Perambalur
Rice 19/ 2019-20: Hybrid Rice Mid Early (Oct 25-Nov 10, 110 to 125 days)			
TNTRH 55 (R) Checks: US 312, ADT 39	5414 kg/ha in 124 days 15.3% increase over ADT 39	Long slender grain with good linear elongation, ratio (LER: 1.76)	All districts except Virudhunagar, Ramnad, Sivagangai, Kanyakumari and The Nilgiris.

d. Cultures recommended for Multi Location Trials 2019-20

MLT I (100- 115 days; May-June sowing) 2019-20

Entry	Parentage	Duration (days)	Grain yield (kg/ha)	Rice grade	Nominating Centre
Repeat					
AD 16028	WGL 14377/MDU 5	116	6283	MS	Aduthurai

CB MAS 14110	I.W. Ponni / Apo	110	6093	MS	Coimbatore
AS 15024	ASD 16/Manjalsaradai	115	6547	MS	Ambasamudram
New					
AD 17152	IET 22075 / ADT (R)48	115	6650	SB	Aduthurai
AD 16052	IET 22075 / ADT (R)48	110	6375	SS	Aduthurai
AD 16019	TurantDhan / IET 22075	95	5798	LS	Aduthurai
CB 15530	JGL 1798/ IET 21572	110	6768	MS	Coimbatore
CB 16585	CO 51/ JGL 17211	112	6954	MS	Coimbatore
AS 13228	ADT 37 / BPT 5204	114	6637	MS	Ambasamudram
AS 16004	Manjalsaradai /ASD 16	115	6897	SB	Ambasamudram
ACK 15001	ADT 36 / ADT 42	115	6705	MB	Killikulam

* The seeds of the culture CB MAS 14110 may be handed over to Dr.R.Pushpam for further maintenance

Checks	:	Rice CO 51, TPS 5, ADT 53 and ADT(R) 48
Replications	:	Three
Plot size	:	9 m ²
Spacing	:	15 x 10 cm
Locations (12)	:	Aduthurai, Coimbatore, Madurai, Ambasamudram, Tirur, Thirupathisaram, Killikulam, Thanjavur, Paiyur, Cuddalore, Pattukotai, Vaigaidam
Seed dispatch	:	6.0kg to be sent to TRRI, Aduthurai on or before 31 st May 2019

MLT II (115-125 days, September/October sowing) 2019-20

Entry	Parentage	Duration (days)	Grain yield (kg/ha)	Rice grade	Nominating Centre
New					
AD 16024	TurantDhan /IET 22075	125	6258	MS	Aduthurai
AD 16269	AD 07260 / AD 10204	126	5875	SB	Aduthurai
AD 17036	WGL 14377 /MDU 5	125	6462	MS	Aduthurai
CB 16512	CO 51 / JGL 17190	120	7295	MS	Coimbatore
CB 16570	CO 51 / JGL 387	120	7048	MS	Coimbatore
TNRH 294	COMS 23A/ CB SN 68	126	6389	MS	Coimbatore
AS 13203	ADT 37 / BPT 5204	121	6216	MS	Ambasamudram
AS 16050	ADT 38 / BPT 5204	124	6216	LS	Ambasamudram

Check	:	TKM 13 , US 312
Replications	:	Three
Plot size	:	9 m ²
Spacing	:	15 x 10 cm
Locations (9)	:	Aduthurai, Coimbatore, Madurai, Ambasamudram, Tirur, Thirupathisaram, Killikulam, Thanjavur, Paiyur
Seed despatch	:	5.5 kg to be sent to TRRI, Aduthurai on or before 31 st May 2019

MLT III (131-140 days, September/October sowing) – 2019-20

Entry	Parentage	Duration (days)	Grain yield (kg/ha)	Rice grade	Nominating Centre
Repeat					
AD13253	AD 01246/CO (R)49	134	5873	MS	Aduthurai
AD15105	BPT 5204/AD02233	137	5826	MS	Aduthurai
New					
AD 16124	CO(R) 50 / AD 08132	134	6698	MS	Aduthurai
AD 16148	AD 04072 / AD 08142	135	6601	SS	Aduthurai
CB 15138	CB09153 / BG 358	133	6906	SB	Coimbatore
TNTRH 105	TNAU 60S / CBSN 355	136	6822	LS	Coimbatore
ACK 14029	TPS 3 / ASD 16	130	5889	MB	Killikulam

Checks	:	CO(R) 50, CO 52 and TNAU Rice Hybrid CO 4
Replications	:	Three
Plot size	:	9m ²
Spacing	:	20 x 10 cm
Locations (13)	:	Aduthurai, Ambasamudram, Coimbatore, Madurai, Thirupathisaram, Sirugamani, Tirur, Killikulam, Vaigaidam, Thanjavur, Cuddalore, Pattukottai and Palur
Seed despatch	:	6.5 kg to be sent to TRRI, Aduthurai on or before 31 st May 2019

MLT – Dry and Semi dry 2019-20

Entry	Parentage	Duration (days)	Grain yield (kg/ha)	Rice grade	Nominating Centre
Repeat					
CB 13804	<i>Norungan / Swarna Sub 1</i>	105	3540	MS	Coimbatore
TM 12012*	<i>ADT 37/ Tadukkan</i>	117	3431	MS	Tirur
PM 16003*	<i>ADT(R)45/ Moreberakkan</i>	112	3240	SS	Paramakudi
New					
TM 14035	IET 23330 / IET 20311	118	3716	MS	Tirur
TM 16017	ADT 39 / IET 20311	117	3736	MS	Tirur

Checks	:	Anna (R) 4, IR 64 dt.QTL
Replications	:	Four
Plot size	:	9 m ²
Spacing	:	20 x 10 cm
Locations (4)	:	Ramnad, Paramakudi, Coimbatore and Tirur

- At Paramakudi, trial is to be conducted bothat field and ROS. The breeder at Paramakudiis incharge for the MLT at Ramnad.
- At Coimbatore, trial is to be conducted in ROS
- Apart from the regular observations, Drought Sensitivity (DRS), Leaf Drying at vegetative stage, Spikelet Fertility and Drought Recovery (DRR) need to be recorded

Special MLT for *Kavuni* lines

Entry	Parentage	Nominating Centre
32-2	CO(R)50 x <i>Kavuni</i>	Dept. Rice & CPMB & B
35-3		
144-2		
145-3		
145-6		
148-2		
Kavuni		
CO 51		
TKM 13		
CO (R) 50		

The seeds are to be sent to TRRI, Aduthurai or before 31st May 2019.

RICE MULTILOCATION TRIALS MONITORING TEAM 2019-20

S.No	MLT Stations	Monitoring team
1	Aduthurai/Thanjavur/ Pattukottai	Dr. R. P. Gnanamalar, Professor(PB&G), AC&RI, Madurai Dr. R.Pushpam, Assoc. Professor(PB&G), Dept. of Rice, Coimbatore Dr.K. Amudha, Assist.Professor(PB&G), Dept. of Rice, Coimbatore Dr.A.Ramanathan, Professor (PAT), TRRI, Aduthurai Dr. P.Anandhi, Assistant Professor (ENT), TRRI, Aduthurai
2	Coimbatore / Sirugamani	Dr. S. Saravanan Assistant Professor (PB&G), AC&RI, Killikulam Dr. P. Arunachalam Assistant Professor (PB&G), AC&RI, Killikulam Dr.C.Gopalakrishnan, Professor (PAT), Dept of Rice, Coimbatore Dr.V.Balasubramani, Professor (ENTO), Dept of Rice, Coimbatore
3	Thirupathisaram/ Killikulam/ Ambasamudram	Dr. D. Sassikumar, Assoc. Professor (PBG), TRRI, Aduthurai Dr. T.Thirumurugan, Assist. Professor (PB&G), AC&RI, Trichy Dr. D.Kumaresan, Assoc.Professore , HREC, Gudalure Dr.A.Ramanathan, Professor (PAT), TRRI, Aduthurai Dr. P. Anandhi, AssitantProfessor (ENT), TRRI, Aduthurai
4	Tirur/ Palur/ Cuddalore	Dr. K.Geetha, Professor (PB&G), RRS, Paiyur Dr.M.Jeyaramachandran, Assistant Professor (PB&G), Vaigai Dam Dr.A.Ramanathan, Professor (PAT), TRRI, Aduthurai Dr. P. Anandhi, Asistant Professor (ENT), TRRI, Aduthurai
5	Madurai/Vaigaidam	Dr. A. Sheeba , Assistant Professor (PB&G), RRS, Tirur Dr. S. Muthuramu, Assistant Professor (PB&G), ARS,

		Paramakudi Dr.C.Gopalakrishnan, Professor (PAT),Dept of Rice, Coimbatore Dr.V.Balasubramani, Professor (ENTO),Dept of Rice, Coimbatore
6	Paramakudi/Ramanathapuram	Dr. R. Suresh, AsistantProfessor (PB&G), TRRI, Aduthurai Dr. Ashish K. Binodh, Assistant Professor, AC&RI, Killikulam Dr.C.Gopalakrishnan, Professor (PAT),Dept of Rice, Coimbatore Dr.V.Balasubramani, Professor (ENTO),Dept of Rice, Coimbatore
7	Paiyur	Dr.S.Banumathy, Associate Professor (PB&G), AC&RI, Madurai Dr. R. Pushpa, Assistant Professor (PB&G), TRRI, Aduthurai Dr.A.Ramanathan, Professor (PAT), TRRI, Aduthurai Dr. P. Anandhi, Asistant Professor (ENT), TRRI, Aduthurai

The monitoring team will visit at appropriate stage of the trial and report on

1. General conduct of the trial
 - a. Plot size and replications
 - b. Labelling of the plots
2. Admixtures, Disease and pest susceptibility if any
3. Top two entries based on visual observation
4. General remarks of the trial and entries.

IV. ACTION PLAN for 2019-20 on Identified Thematic Areas of Research

THEME I. DEVELOPING CLIMATE SMART VARIETIES BY GENE PYRAMIDING

A. Pyramiding of Biotic stress resistance genes

Sl.No	Activity	Work plan for the year 2019-20	Station/ Scientist Incharge
1.	Development of Biotic stress tolerant rice through pyramiding of genes for BLB, Blast and BPH resistance.	a. Validation of resistance for BLB, Blast and BPH through artificial screening of donor lines from different sources b. Phenotypic evaluation of lines	TRRI: Dr.D.Sassikumar, Associate Professor (PB&G) Dr. A. Ramanathan, Professor (PAT) Dr.P.Ananthi, Assistant Professor (ENT) Department of Rice Dr.K.Amudha, Assistant Professor (PB&G) Dr.C.Gopalakrishnan, Professor (PAT) Dr. V. Balasubramani, Professor (ENT) CPMB&B: Genotyping Dr.M.Raveendran, Professor (CPMB&B) Dr.V.Thiruvengadam, Assistant Professor, Dept.of PGR
2.		Synthesis of crosses involving TKM 13 and CO 52 as female parents and donors for BLB and BPH	

B. Double trouble (drought + salinity) tolerant rice

Sl.No	Activity	Work plan for the year 2019-20	Station/ Scientist Incharge
1.	Development of rice genotypes tolerant to drought and salinity stress through marker aided selection	Validation of donors for tolerance to salinity and drought through artificial screening	Department of Rice : Artificial screening for the traits: Dr.R. Pushpam, Associate Professor (PB&G) Dr.K.Krishna Surendar, Assistant Professor (CRP) ARS, Paramakudi : Dr. S. Muthuramu, AP (PB&G) ADAC&RI, Trichy: Dr.T.Thirumurugan AP (PB&G) CPMB &B: Marker validation: Dr. M. Raveendran
2.		Synthesis of crosses involving ADT 53, ADT 37, TRY 2, Anna(R)4with donors	

THEME II. BREAKING THE YIELD BARRIERS IN RICE

Sl.No	Activity	Work plan for the year 2019-20	Station/ Scientist Incharge
1.	Synthesis of TNAU MAGIC population	Synthesis of single crosses for the following combinations 1. CO (R) 50 / VGD 1 2. TRY 3 / IR 20 3. CR 1009 / <i>Thooyamalli</i> 4. TPS 5 / CB 13132 5. ADT 52 / WRM 36-3-3 6. ASD 16 / <i>Mappillai Samba</i> 7. TKM 13 / AC 38471 8. ADT 39 / GEB 24	TRRI: Dr.R.Suresh, Assistant Professor (PB&G) Dr.D.Sassikumar, Associate Professor (PB&G) Dr.R.Pushpa, Assistant Professor (PB&G) Mrs. A. Arulmozhi, Assistant Professor (PB&G) CPMB&B: Development of markers for genotyping Dr.M.Raveendran, Professor (Biotechnology)
2.	Next generation restorers using Wild Rice MAGIC lines and Tropical <i>Japonica</i> lines	a. Raising of F ₁ s generated from R x Wild Rice Magic parents and forwarding to F ₂ . Attempting one backcross in selective crosses with the respective R lines and raising BC ₁ F ₁ s. b. Raising of F ₂ generation of <i>indica</i> / tropical <i>japonica</i> crosses and selection of plants with complete fertility and other agro-morphological traits and generation advancement to F ₃ c. Raising of BC ₁ F ₁ s of <i>indica</i> / tropical <i>japonica</i> crosses and advancement to F ₂ .	Department of Rice Dr.R.Saraswathi (PB&G)
3.	Developing new CMS lines with enhanced outcrossing	a. Screening of a new set of maintainers and available maintainer lines for traits that favour outcrossing. b. Generating crosses of the identified maintainers with CMS lines	

THEME III. BREEDING FOR SPECIAL TRAITS

Sl.No	Activity	Work plan for the year 2019-20	Station/ Scientist Incharge
1.	Developing pre-breeding stocks for direct seeded rice		
A.	Screening of available released varieties and land races for early emergence, anaerobic germination and early vigour	Artificial screening of all the varieties and landraces for early emergence, anaerobic germination and early vigour Drought endurance using the facility of ROS	Laboratory screening Seed Technologists TRRI: Dr.S.Punithavathi, Associate Professor (SST) ADAC&RI, Trichy – Dr.Evera, Assistant Professor (SST) ARS, Paramakudi-ROS screening Dr.S.Mutharamu-, Assistant Professor (PB&G)
B.	Synthesis of fresh crosses	Hybridisation with the identified donors	TRRI: Dr.R.Suresh, Assistant Professor (PB&G)
2.	Enriching accumulation of therapeutic proprieties in rice		
A.	Evaluating the improved <i>Kavuni</i> lines for agronomic traits and photosensitivity	Evaluation of six improved <i>Kavuni</i> lines under yield trials at Aduthurai and Coimbatore during first season for confirmation of photoinsensitivity.	TRRI: Dr.D.Sassikumar, Associate Professor (PB&G) Department of Rice : Dr.R.Pushpam, Associate Professor(PB&G)
B.		Conduct of Special MLT in four locations viz., ADT, CBE, TPS and ASD during the second season	ADT: Dr.D.Sassikumar, Associate Professor (PB&G) Dr.R.Pushpa, AsistantProfessor (PB&G) CBE: Dr.R.Pushpam Associate Professor (PB&G) Dr.K.Amudha, Assistant Professor (PB&G) TPS: Dr.N.Shunmugavalli, Professor (PB&G) ASD : Dr.S.Arumugachamy, Professor (PB&G)
C.		Estimation of nutritive and therapeutic values in the Improved <i>Kavuni</i> lines harvested from different locations	CPMB & B : Dr.M.Raveendran, Professor (Biotech)
3.	Resource Use Efficient Rice		
	Developing Phosphorous Use Efficient cultures	The P rich paddy lines will be subjected to yield evaluation Hydroponics studies to confirm the stress tolerance	AC&RI, Madurai : Dr. J. Ramalingam, Professor (Biotechnology) Dr. S. Banumathy, Associate Professor (PB&G) AC&RI, Killikulam Dr.Aanandhi, Assistant Professor, (PB&G)

4.	Special Purpose Rice,		
	Identification of rice varieties suitable for popping	Screening of all released rice varieties for popping quality	AC&RI, Madurai: Dr.R.Gnanamalar, Professor (PB&G)& Dr.S. Banumathy, Associate Professor (PB&G) CSCRI, Madurai: Dr.K.Jothilakshmi, Assistant Professor

THEME IV. REJUVENATION AND RECONSTITUTION OF LAND RACES

Sl.No	Activity	Work plan for the year 2019-20	Station/ Scientist Incharge
1.	Characterisation and documentation of all landraces pertinent to Tamil Nadu	The varieties released through PLS and the land races available at PGR, Department of Rice and TRRI, Aduthurai including <i>Mottakuruva</i> from Kanyakumari will be raised for purification.	TRRI Dr.D.Sassikumar, Associate Professor (PB&G) Dr.R.Pushpa, Assistant Professor (PB&G) Department of Rice Dr.K.Amudha, Assistant Professor (PB&G) PGR : Dr.S.Ganeshram, Professor (PB&G) Dr.V.Thiruvengadam, Assistant Professor (PB&G)

THEME V. NEXT GENERATION GENOMICS AND BIO-INFORMATICS FOR ALLELE MINING AND TRAIT DISCOVERY

Sl.No	Activity	Work plan for the year 2019-20	Station/ Scientist Incharge
1.	Whole genome re-sequencing of native rice	Allele mining of agronomically important genes	AC&RI, Madurai Dr.J. Ramalingam Professor (Biotechnology) CPMB & B Dr.M.Raveendran, Professor (Biotechnology)
2.	Exploiting newer molecular tools for trait improvement	Genetic modification of novel traits using genome editing, RNAi technologies	CPMB & B Dr.D.Sudhakar, Professor (Biotechnology) Dr.M.Raveendran, Professor (Biotechnology)

V. PROJECT WISE REMARKS – CPBG

S. No.	Project No. & title	Remarks
I. PROJECTS ON GERMPASM MAINTENANCE – ADUTHURAI		
COIMBATORE		
1.	CPBG/CBE/PBG/RIC/2016/001: Germplasm collection, evaluation and conservation in rice Dr. K. Amudha , Assistant Professor (PB&G) (June 2016 to May 2021)	The work under the action plan IV (2019-2020) rejuvenation and reconstitution of landraces should be carried out under this project The project may be continued
II. PROJECTS ON EVOLUTION – ADUTHURAI		
2.	CPBG/ADT/PBG/RIC/2015/012: Development of medium duration rice with high potential, preferential grain quality and resistance to BLB suitable for irrigated ecosystem of Tamil Nadu Dr.D.Sassikumar, Assoc. Professor (PBG) October 2015 to September 2018	The project may be closed and completion report has to be submitted.
3.	CPBG/ADT/PBG/RIC/2017/001: Evolving short duration rice varieties/culture with fine grain and resistance to blast, brown plant hopper and bacterial leaf blight Dr.R. Suresh, Asst. Professor (PBG) June 2017 to May 2022	The Project may be continued
4.	CPBG/ADT/PBG/RIC/2017/05: Evolution of extra early rice varieties (<100 days) suitable for direct seeding in water limited areas of CDZ Dr.R. Suresh, Asst. Professor (PBG) June 2017 to May 2022	The Project may be continued
5.	CPBG/ADT/PBG/RIC/2017/006: (Core project) Development of breeding stocks in rice with preferable nutritional properties Dr.R.Pushpa, Assistant Professor (PBG) November 2017 to October 2022	The Project may be continued
6.	CPBG/ADT/PBG/RIC/2018/CP044: (Core Project) Development of super fine short slender rice variety with enhanced nutritional qualities suitable for Tamil Nadu	The Project may be continued. The iron content should be assessed through AAS

	Dr.R.Pushpa, Assistant Professor (PBG) April 2018 to March 2021	
7.	CPBG/ADT/PBG/RIC/2017/002: Nucleus seed production of medium and long duration rice varieties of TRRI, Aduthurai Dr. R. Suresh Asst. Prof. (PB&G) Sep. 2017 to Aug. 2022	The Project may be continued
8.	CPBG/ADT/PBG/RIC/2017/003: Development of high yielding, non lodging, long duration (> 140 days) rice varieties suitable for samba season Dr. R. Manimaran, Asst. Prof. (PB&G), Aug. 2017 to July 2022	The Project may be continued and change of Project Leader may be reported
9.	CPBG/ADT/PBG/RIC/2017/004: Breeder seed production of short, medium and long duration rice varieties Dr. D. Sassikumar Assoc. Prof. (PBG) Sep. 2017-Aug. 2020	The Project may be continued
10.	CPBG/CBE/PBG/RIC/2016/002: Evolution of fine grain medium duration rice varieties resistance to blast and BLB Dr. K. Amudha Assistant Professor (PB&G) June 2016 to May 2021	Donors identified as resistance to blast and BLB may be included in the hybridization programme. The project may be continued
11.	CPBG/CBE/PBG/RIC/2016/003: Development of stable CMS lines and restorer/maintainer breeding in rice with good phenotypic acceptability Dr.R.Saraswathi, Professor (PB&G) June 2016 to May 2021	The Project may be continued
12.	CPBG/CBE/PBG/RIC/2016/004: Development of new three line hybrids with high yield and quality Dr.R.Saraswathi, Professor (PB&G) June 2016 to May 2021	The Project may be continued

COIMBATORE – CPBG		
13.	CPBG/CBE/PBG/RIC/2016/005: Developing early maturing (105-115 days) rice varieties resistant /tolerant to BPH and blast (Dr. P. Jeyaprakash, Professor (PB&G) June 2016 to May 2021	The Project may be continued and the change of Project Leader may be reported
14.	CPBG/CBE/PBG/RIC/2017/001: Development of two line hybrids and TGMS lines in rice Dr.R.Saraswathi, Professor (PB&G) January 2017 to December 2021	The Project may be continued
15.	CPBG/CBE/PBG/RIC/2016/006 Maintenance breeding of CO varieties and Breeder seed multiplication Dr. P. Jeyaprakash, Prof. (PB&G) June 2016 to May 2021	Utmost care should be given for maintaining genetic purity. The Project may be continued and the change of Project Leader may be reported
16.	CPBG/CBE/PBG/RIC/2017/002 Maintenance breeding of parents, seed multiplication of advanced hybrids and released hybrids in rice Dr. R. Saraswathi, Prof.(PB&G) June 2017 to May 2022	The Project may be continued. Utmost care should be given for maintaining the genetic purity.
CPMB &B, Coimbatore		
17.	CPMB/CBE/BIF/2018/001: Functional annotation of hypothetical proteins present in <i>Xanthomonas oryzae</i> for prioritizing the targets against Bacterial blight Tmt. N. Bharathi ,Asst. Professor (Bioinformatics) Dr. M. Sudha, Assistant Professor (Biotechnology) January 2018 to January 2020	Interaction studies for remaining targets may be performed and the lead compound to be validated.
18.	URP/CPMB/CBE/PMB/2015/ 001: Deciphering Long non-coding RNAs and Database development in rice. Dr N. Saranya, Assistant Professor (Bioinformatics) June 2015 to July 2018	Completion report may be submitted within the month of June.

19.	CPMB/CBE/BIN/PLN/2015/001: Development of database and software tools for identifying polymorphic SSR markers in plant genomes Dr. M. Jayakanthan, Assistant Professor (Bioinformatics) July 2015 to July 2018	Software may be tested in a set of rice genotypes of Tamil Nadu origin for which sequence information is available in 3Krice genome project. Completion report may be submitted. Patent /publication can be done.
20.	CPMB/CBE/PBT/RIC/2018/CP140: (Core Project) Understanding the role of microbiome (s) in modulating stress responses/ nutrient uptake in rice R. Raghu, Assistant Professor (Agrl. Microbiology) 2018 to 2020	The Project may be continued
AMBASAMUDRAM		
21.	CPBG/ASD/PBG/RIC/2016/001: Evolving high yielding medium duration rice variety suitable for <i>Pishanam</i> season Dr. S. Arumugachamy, Professor (PB&G) June 2016 to May 2021	The Project may be continued
22.	CPBG/ASD/PBG/RIC/2019/001: Evolving high yielding short duration rice variety suitable for <i>Kar</i> and Late <i>Pishanam</i> seasons of Thamirabarani tract Dr. S. Arumugachamy, Professor (PB&G) April 2019 – March 2024	The Project may be continued
23	CPBG/ASD/PBG/RIC/2016/002: Breeder seed production of rice varieties ASD 16, ASD 18 and ASD 19 Dr. A. Muthuswamy, Asst. Prof. (PBG) Jun 2016 to May 2019	The project may be closed and completion report has to be submitted. New project may be initiated
THIRUPATHISARAM		
24.	CPBG/TPS/PBG/RIC/2016/001: Evolving early duration rice variety suitable for <i>Kannipoc</i> season of Kanyakumari district. Dr. N. Shunmugavalli, Professor(PBG) & Head Dec. 2016 - Nov. 2021	The Project may be continued

25.	CPBG/TPS/PBG/RIC/2016/002: Evolving long duration rice variety suitable for <i>Kumbapoc</i> season of Kanyakumari district. Dr. N. Shunmugavalli, Professor(PBG)& Head Dec., 2015to Nov., 2020	The Project may be continued
TIRURKUPPAM		
26.	CPBG/TKM/ PBG/RIC/2015/001: Evolving short duration drought tolerant rice varieties suitable for rainfed /semidry conditions. Dr.A. Sheeba, Asst.Professor (PB&G) Dec., 2015 to Nov., 2020	The advance yield trial should be conducted in semidry condition.The project may be continued
MADURAI		
27.	CPBG/MDU/ PBG/ RIC/ New: Evolution of high yielding fine grain quality medium duration rice variety suitable for PeriyarVaigai River Project Area. Dr. R.P.Gnanamalar,Professor(PB&G) Dr. K. Premalatha, Assistant Professor (Agrl.Ento.) December 2018 to November 2023	The crosses to be minimized and specific crosses may be focused. The cold tolerant materials received from Paiyur may be included and evaluated. Necessary URP proposal to be submitted through proper channel for obtaining project remember from Director of Research.
28.	CPBG/MDU/PBG/RIC/2015/002: Evolution of high yielding extra-early rice variety for rainfed / tank-fed areas of Tamil Nadu Dr. P. Arunachalam, Assistant Professor (PB&G) April 2015 to March 2018	The project may be closed and completion report submitted
29.	CPBG/MDU/ PBG/ RIC/2018/New: Development of high yielding short duration rice variety with fine grain, BPH and Blast resistance Dr.A.Yuvaraja, Associate Professor (PB&G) December 2018 to November 2023	The genetic materials to be handed over to Dr.S.Banumathy. He may propose an URP on Red grain sorghum and Project number is to be obtained.
30.	CPBG/MDU/PBG/ RIC/2017/002: Development of drought tolerant variety in rice. Dr.S.Banumathy,ASP (PBG), Dr.R.Amutha,Professor (CRP), August 2017 to July 2022	Materials generated may be handed over to ARS, Paramakudi

KILLIKULAM		
31.	CPBG/ KKM/ PBG/ RIC/ 2014/ 001: Evolution of high yielding short duration rice variety (110-115 days) for <i>Kar</i> and <i>Pishanam</i> seasons of Thoothukudi district Dr.M. Arumugam Pillai, Professor(PBG) and Head June 2014 to March 2017; Extended upto March 2019	The Project may be continued
32.	CPBG/KKM/PBG/RIC/2017/001: Development of high yielding medium duration rice variety with desirable cooking quality traits suited for <i>Pishanam</i> season in Southern districts of Tamil Nadu Dr. S. Saravanan, Assistant Professor (PBG) April 2017 to March 2022	The Project may be continued. Any traditional rice germplasm collected should be validated for specific trait and sample seeds supplied to Department of PGR.
33.	CPBG/KKM/PBG/RIC/2017/002: Maintenance breeding for breeder seed production of rice varieties released from TNAU Dr.S. Saravanan, Asst.Prof.(PBG), Sep 2017 to Aug 2020	The Project may be continued
ADAC&RI, TRICHY		
34.	CPBG/TRY/PBG/RIC/2016/001: Development of high yielding sodicity tolerant rice varieties with desirable grain quality Dr. T. Thirumurugan, Assistant Professor (PB&G) October 2016 to September 2019	The sodicity tolerant culture from Advance Yield Trial may be identified and nominated for MLT in the ensuing year. The project may be continued
35.	CPBG/TRY/PBG/RIC/2018/001: Breeder seed production in rice. Dr.S. Chitra, Asst. Prof.(PBG) June 2018 to May 2021	The Project may be continued and genetic purity to be maintained.
SIRUGAMANI		
36.	CPBG/SGM/PBG/RIC/2017/001: Breeder seed production in paddy and distribution Dr.K. Bharathi Kumar, Asst.Prof(PBG) October 2017 to September 2020	The Project may be continued and the change of Project Leader may be reported

	KUMULUR	
37.	CPBG/KUM/PBG/RIC/2017/001: Breeder seed production and distribution of rice varieties Dr. K. Geetha, Prof.(PBG) June 2017 to May 2020	The Project may be continued and the change of Project Leader may be reported
	GUDALUR	
38.	CPBG/GDR/PBG/Rice/2016/001: Development, evaluation and multiplication of Temperature Sensitive Genic Male Sterile (TGMS) lines suitable for Tamil Nadu Dr. D. Kumaresan, Associate Professor and Head September 2015 to August 2020	The Project may be continued
	PARAMAKUDI	
39.	CPBG/PMK/PBG/RIC/2015/004: Evolution of early / very early duration drought tolerant rice genotypes with acceptable grain and cooking quality suitable for rainfed rice ecosystem. Dr.S.Muthuramu,Assistant Professor (PB&G) September 2015 to August 2020	The Project may be continued. New material transferred from Madurai need to be evaluated under this project.
	THANJAVUR	
40.	TRRI/SWMRI/TNJ/PBG/2013/001: Development of early duration rice suitable for direct sown paddy areas in Cauvery Delta Zone of Tamil Nadu Dr. D.Sassikumar, Assoc.Prof (PBG), TRRI, Aduthurai Dr.S.Santha, Assoc.Prof (PBG), HC&RI, Periyakulam Dr.L.Subha, Assistant Professor, SWMRI, TNJ April 2013 to March 2018 (5 Years)	The project may be closed and completion report may be submitted immediately
	BHAVANISAGAR	
41.	CPBG/BSR/PBG/RIC/2016/ 001: Nucleus and Breeder seed production in popular rice varieties of Tamil Nadu Dr.B.Meenakumari, Asst.Prof. (PB&G) June 2016 to May 2021	The Project may be continued and genetic purity of varieties ensured.

	VAIG Aidam	
42.	CPBG/VGD/PBG/RIC/2010/001: Breeder seed production in paddy Dr.M.Jayaramachandran, Asst.Prof.(PBG) October 2018 to September 2021	The Project may be continued
	PAIYUR	
43.	CPBG/PAI/PBG/RIC/2016/001: Development of early maturing, cold tolerant rice varieties combined with quality traits Dr. K.Geetha, Professor (PB&G) June 2016 to December 2018	The project may be closed and completion report to be submitted. The materials to be transferred to Madurai.

B. CROP MANAGEMENT

A. Specific recommendation

- i. Research work on Drought mitigation strategies for rice has to be strengthened for increasing productivity.
- ii. Management practices for growing rice under problematic soil should be evolved.
- iii. Complete package of practices for growing rice under organic cultivation may be developed and validated.

B. Genral recommendation

a. For Adoption:

1. Package of Practices for Mechanised semidry rice cultivation

- Sowing of hardened seeds by seed drill with a seed rate of 40 kg/ha + Application of pre emergence herbicide Pretilachlor @ 0.45 kg /ha on 5 DAS and two machine weeding (power weeder) on 30 and 45 DAS + Alternate Wetting and Drying irrigation + STCR based NPK practices.

2. Bio-fortification of Zn in rice grains

- To increase yield and Zn content in rice grain, basal soil application of 50 kg ZnSO₄ along with foliar spraying of 0.5 % ZnSO₄ thrice at 50% flowering, milky and dough stages to be followed.

3. Non Puddled transplanted rice in *Kuruvai* and No-till in *Thaladi* in Cauvery Delta Zone

- Growing rice Direct seeded rice (*Kuruvai*) – Puddled transplanted rice (*Thaladi*) – No tillage (Summer) or Non Puddled transplanted rice(*Kuruvai*) - Puddled transplanted rice (*Thaladi*) - No tillage (Summer) could be best crop establishment methods for obtaining higher system productivity and profitability.
- Under water scarcity condition, adoption of either Non Puddled transplanted rice or Direct seeded rice during *Kuruva* season followed by No tillage during *Thaladi* season as an alternate method to Puddled transplanted rice in Cauvery Delta Zone for obtaining higher productivity with lesser quantity of water

4. Alternate cropping system for Cauvery Delta Zone

- An alternate system of Pulse - Rice - Pulse and Maize - Rice – Pulse is recommended for Aduthurai and Thanjavur respectively against existing system (Rice - Rice - Pulse).

5. Traditional rice cultivation through organics under rainfed ecosystem

- Traditional variety Chithiraikar and Norungun are recommended along with application of FYM @12.5 t/ha + Panchakaviya (3%) + PPFM (1%) spray under traditional rainfed rice growing regions

6. Comprehensive technology for growing rice under Sodic Soil

- In Sodic soil, Daincha incorporation followed by rice wet seeding + biofertiliser with 100% soil test based NPK treatment recorded higher grain yield and net return under water scarce condition

b. For information:

1. Mitigation of methane emission from rice

- Low methane emission observed under modified SRI (48 kg/ha/season) and AWD (45 kg/ha/season) methods when compared to conventional method of planting.

2. Profitable Cropping sequence for New Cauvery Delta

- Rice + Daincha (10:1) in rabi season and Maize + Green gram in summer season achieved higher system productivity REY of 11361 kg/ha/year with B:C ratio 2.30.

3. Rice cultivars suitable for organic farming (SOA)

- Rice varieties suited for organic farming are Bhavani, Improved white Ponni, Mapillai samba, Kichedi samba, IR 20, CO 43, CO (R) 48 and CO 51.
- Medicinal and aromatic category varieties such as Red kavuni, Jeeraga samba, KDML 105 and culture CB 05022 are also suitable for organic rice cultivation.

4. Long-term herbicidal weed management in transplanted rice-rice system (Agronomy)

- During *Kharif* season, pre emergence application of Pyrasosulfuron ethyl (10% WP) @ 20g/ha followed by post emergence application of Bispyribac sodium(10% EC) at 25 g/ha and during *rabi* season, pre emergence application of Bensulfuron methyl (0.6%) + Pretilachlor (6.6%) followed by Post emergence application of Bispyribac sodium (10% EC) at 25 g/ha recorded lesser weed density, higher weed control efficiency and enhanced rice crop productivity.

5. Permanent manurial experiments in rice based cropping system (SS&AC)

- Fifty four years of continuous experiments with rice-rice cropping system on Kalathur soil series (Udic Chromusterts) at old Cauvery delta zone of Aduthurai showed that integrated application of 125:50:50 kg NPK + 6.25 t green manure ha⁻¹ for *kuruva* season and 150:60:60 kg NPK + 12.5 t FYM ha⁻¹ for *thaladi* season is optimal for achieving higher yield and sustaining soil fertility. The same treatments maintained positive balance of available NPK and higher microbial population in the soil.
- In Madurai, 60 years of continuous experiments with single rice crop on Madukkur soil series (Typic haplustalf) revealed that, combined application of 150:50:50 kg NPK + 6.25 t green leaf manure ha⁻¹ increased the grain yield, urease and dehydrogenase activity besides improving the soil microbial populations. Further it also resulted in negative balance of N (-24 to -92 kg ha⁻¹), positive balance of P (10.4 to 23.6 kg ha⁻¹) and K (10.4 to 23.6 kg ha⁻¹)

6. Evaluation of organic and inorganic sources under safe AWDI method in transplanted rice

- Application of 150:50:50 kg NPK + FYM @ 12.5 t ha⁻¹ with safe AWDI recorded the highest grain yield of rice which was on par with STCR-IPNS based fertilizer prescription (147: 21: 63 kg N, P₂O₅ and K₂O per ha + green manure @ 6.25 t ha⁻¹ for a soil test value of 156:31:184 kg NPK ha⁻¹ with yield target of 6 t ha⁻¹). Adopting STCR-IPNS recommendations resulted in a fertilizer saving of 29 kg P₂O₅ (58%) over RDF. Inclusion of any one organic manures *viz.*, FYM, green manure, poultry manure, vermicompost,

composted coir pith can be recommended based on the availability at farm level for soil health enhancement. Poultry manure addition increased the soil available P by 29 % over control.

7. Multi-functional *Bacillus altitudinis* FD48 for modulating moisture stress tolerance in rice

- Volatile (Action, Choline and Betaine aldehyde cation, Geranylisovalerate, Butanoic acid, Fumaric acid, Phenylalanine, L-Proline, L-2-Aminobutyric acid, Benzaldehyde, Asparagine and soluble metabolites (Upregulation of proline, Phenol, & γ -aminobutyric acid (GABA)) produced by *B. altitudinis* FD48 under induced moisture stress (Poly ethylene glycol ~0.75 Mpa) conditions revealed the prime role in modulating drought tolerance for rice crop.

8. Rice apoplast microbiome and metabolome

- The apoplast associated bacterium, *Bacillus methylotrophicus* RABA6 could be considered as a potential plant growth promoting microbe regulating hormones besides up-regulation of antioxidant enzymes and root secreted metabolites for mitigating drought stress in rice.

9. Volatile metabolite induced Plant defence by antagonistic fungi

- *Trichoderma longibrachiatum* EF5, an endophytic fungus reduced the disease incidence of sheath blight caused by *Rhizoctonia solani* up to 70 percent by releasing mVOC such as longifolene, azulene, caryophyllene, etc.,

10. Influence of silicon on improving drought tolerance in rice genotypes

- Foliar spray of silicon (Silixol 0.6%) at 75 and 90 DAT during mid drought, resulted in higher leaf silicon content with erect leaves that helped in lower light transmission ratio, higher leaf area index, higher photosynthetic rate with increase in yield by 10 to 18 percent.

11. Multi- site monitoring of canopy micrometeorology and heat stresses of rice under

Climate change

- The heat tolerant rice variety, Nagina 22 showed advancement in flower opening time and the First Spikelet Opening Time (FSOT) was observed at 09:35 am. The FSOT of IR 64 and IR 52 was much later. Stress imposed at anthesis showed reduction in photosynthetic rate, stomatal conductance and transpiration

12. Management of Angoumois grain moth in seed storage goes down

- Seed treatment with Thiamethoxam 30 FS @ 5ml/kg is effective in controlling the Angoumois grain moth (*Sitotrogacerealella*) during storage. Non-woven bags can be used as cost effective alternate seed packing material instead of gunny bag for storing rice seeds with above 80% germination upto 12 months of storage.

III. On Farm Trials (OFT's) for the year 2019-20:

OFT 1. Alternate crops for *Kuruvai* (1st crop) season as a contingent plan in limited water scarce situation

Objectives: To identify the economically viable water efficient contingent crops for different irrigation regimes.

Treatment details:

T ₁ :	Pre monsoon sowing	: Greengram, Sesame & Panivaragu
T ₂ :	Sowing and life irrigation	: Greengram, Sesame & Panivaragu
T ₃ :	Irrigation during critical stages	: Greengram, Sesame & Groundnut
T ₄ :	Irrigation based on crop need	: Greengram, Maize & Groundnut

Observation to be recorded:

Rain fall data including effective rainfall, germination percent, Population at 15 and 45 DAS of grain yield & straw yield, Consumptive use of water and water productivity, Economic analysis

Co-ordinating centre & Scientist In-charge:	AC&RI, Madurai	Dr. E. Subramanian, Assistant Professor (Agronomy) Dr. P. Kannan, Assistant Professor (SS&AC)
Centres & Scientist In-charge:	SWMRI, Thanjavur	Dr. Porpavai, Professor (Agronomy) & Head
	AC&RI, Killikulam	Dr.M.Hemalatha Associate Professor (Agronomy)
	RRS, Ambasamudram	Dr.S.R.ShriRangasami Assistant Professor (Agronomy)
	AEC&RI, Kumulur	Dr. S. Vallalkannan, Assistant Professor (Agronomy)

OFT 2. Cost effective weed management practices in direct seeded rice under puddled low land condition

Objectives: To identify the suitable and cost effective weed management practices for direct (drum) seeded rice

Treatments:

T₁ - PE Pyrazosulfuron ethyl 10% WP @ 20 g ha⁻¹ at 3 DAS+POE Bispyribac sodium 10% SC @ 25 g ha⁻¹ at 2-3 leaf stage (20-25 DAS)

T₂ - PE Pretilachlor 50 % EC @ 0.75 kg ha⁻¹ at 7 DAS fb HW at 45 DAS (Farmers' Practice)

Variety: ADT 53

Observations to be recorded

- Weed flora and weed density at 30 and 60 DAS; Weed control efficiency
- Plant population m⁻² ; Growth and yield attributes
- Yield and economics

Co-ordinating centre& Scientist In-charge:	AC&RI, Vazhavachanur	Dr. C. Sivakumar Associate Professor(Agronomy)
Centres& Scientist In-charge:	RRS,Tirur,	Dr. C. Muralitharan Professor (Agronomy)
	TRRI, Aduthurai	Dr. M. Raju Associate Professor(Agronomy)
	ARS, Bavanisagar	Dr. N. Satheesh Kumar Assistant Professor (Agronomy)
	AC&RI, Killikulam	Dr. M. Hemalatha Associate Professor (Agronomy)
	RRS,Ambasamudram	Dr. S. R. Shri Rangasami Assistant Professor (Agronomy)
	AC&RI, Madurai	Dr. E. Subramanian Assistant Professor (Agronomy)

OFT 3. Improvement of grain filling in rice by foliar spray of nutrients and growth promoters

Objectives:

- To identify the suitable foliar nutrient/growth promoter for enhancing grain filling in rice.

Treatment details:

T₁ - Control
T₂ – MAP (2%) + KCl (1%)
T₃- 6-Benzylaminopurine (30 ppm)

- Foliar spray at pre-anthesis (just before heading stage) and post-anthesis (2 weeks after flowering stage)

Observations to be recorded:

Chlorophyll Index value in flag leaf, Photosynthetic rate (μ mole of CO₂ m² s⁻¹) in flag leaf area at 50% flowering and grain filling stages, Primary & secondary branches/panicle, Number of grains in apical and basal branches, Spikelet fertility (%), Panicle dry weight (g), Grain filling duration (days), Grain filling rate (mg grain⁻¹ day⁻¹), Grain Yield per plant, Grain Yield (kg/ha), B:C ratio

Co-ordinating centre & Scientist In-charge:	Department of Crop Physiology, TNAU, Coimbatore.	Dr. V. Ravichandran, Assoc. Prof. (CRP) Dr. K. Vanitha, Asst. Prof. (CRP)
	Department of Rice, TNAU, Coimbatore	Dr. K. Krishna Surendar, Asst Prof. (CRP) Dr. G. Senthil Kumar, Asst. Prof. (Agron.)
Centres & Scientist In-charge:	TRRI, Aduthurai	Dr. M. Raju, Assoc. Professor (Agronomy)
	ARS, Bavanisagar	Dr. V. Vakeswaran, Asst. Prof. (SST)

IV. Action Plan

Action plan 1. Documentation of weed biology and assessing crop weed competition in

Direct seeded rice ecosystem

Rationale:

- Weed menace in DSR ecosystem
- Weeds and crop compete with each other
- Drastic yield reduction under DSR

Objective:

- To document weed biology and assessing crop weed interference period in Direct Seeded Rice

Treatments:

Main plot:

M₁ – DSR under puddled condition

M₂ – DSR under unpuddled condition

Sub plot:

S₁ – Weedy upto 15 DAS; S₂ – Weedy upto 30 DAS

S₃ – Weedy upto 45 DAS; S₄ – Weedy upto 60 DAS

S₅ – Weed free upto 15 DAS; S₆ – Weed free upto 30 DAS

S₇ – Weed free upto 45 DAS; S₈ – Weed free upto 60 DAS

Design: Split plot design

Variety: ADT 53

Duration: Two Years (2019-20 & 2020-21)

Co-ordinating centre & Scientist In-charge:	Dept. of Agronomy, TNAU, Coimbatore.	Dr. P. Murali Arthanari Associate Professor (Agronomy) Dr. G. Senthil Kumar Assistant Professor (Agronomy)
Centres & Scientist In-charge:	TRRI, Aduthurai	Dr. M. Raju Associate Professor (Agronomy)

	AC&RI, Madurai	Dr. E. Subramanian Assistant Professor(Agronomy)
	AC&RI, Killikulam	Dr. N. Senthil Kumar Assistant Professor(Agronomy)
	ARS, Bhavanisagar	Dr. N. Satheesh Kumar Assistant Professor(Agronomy)

Action plan 2. Climate smart organic farming in rice

Rationale:

- Widespread changes in rainfall and temperature
- Climate induced water scarcity
- Elevated soil temperature and emission of Methane
- Growing interest on organic rice cultivation

Objectives:

- To develop a climate resilient protocol for sustainable organic rice farming
- To study the impact of organic packages on rice quality growth and productivity
- To analyze the economic feasibility of the protocol developed

Treatments

T ₁	Modified SRI with RDF
T ₂	Modified SRI with EFYM @ 750 kg/ha+neem cake @250 kg/ha+vermicompost@1t/ha in two equal splits at AT and PI stages + 3% Panchagavya as foliar spray twice (15 days before and after flowering)
T ₃	Green manure/Green leaf manure application @6.25t/ha+vermicompost @ 1t/ha+neem cake @250 kg/ha+3% Panchagavya as foliar spray twice (15 days before and after flowering)
T ₄	T ₂ +AWD using FWT
T ₅	T ₃ + AWD using FWT
T ₆	FYM @12.5 t/ha + RDF (check)
T ₇	Green manure grown <i>in situ</i> + 3% Panchagavya spray (farmer's practice)

Design : RBD
Replications : 3
Variety : CO (R) 48
Season : *Rabi*
Duration : **Three Years (2019-20 to 2021-22)**

Observations:

Weather parameters (air temperature, soil temperature, rainfall, wind speed etc), Greenhouse gas emission (Methane, CO₂etc), Growth and yield attributes of rice, Economic analysis

Co-ordinating centre& Scientist In-charge:	Agro Climatic Research Centre & Sustainable Organic Agriculture, TNAU, Coimbatore	Dr. SP. Ramanathan, Prof & Head, ACRC Dr. E. Somasundaram, Prof & Head, SOA Dr. K. Ganesan, Asst. Prof (Ag. Ento.), SOA
Centres& Scientist In-charge:	RRS, Tirur	Dr. V. M. Sankaran, Prof & Head Dr. S. Malathi, Asst. Prof (Pl. Patho.)
	AC & RI, Madurai	Dr. E. Subramanian, Asst. Prof (Agron.) Dr. P. Kannan, Asst. Prof (SS & AC)
	RRS, Ambasamudram	Dr. S.R. Shri Rangasami, Asst. Prof (Agron.) Dr. K. G. Sabarinathan, Asst. Prof (Ag.Micro.)
	TRRI, Aduthurai	Dr. M. Raju, Assoc. Prof. (Agron.) Dr. C. Umamageswari, Assoc. Prof. (Agron.)

Action plan 3. Standardization of Drip Fertigation techniques in rice based cropping systems of Tamil Nadu

Objectives:

- To evaluate the performance of rice based cropping systems under micro irrigation in order to improve the WUE of the cropping system.
- To standardize the fertigation schedule for rice and its components crops in the system for enhancing the nutrient use efficiency.
- To work out the economic feasibility of drip fertigation system in rice based crop sequence.

Cropping system to be tested:

- Kharif** : Groundnut/Maize/Pulses/ Vegetables (Choose the crop existing in respective agro climatic zone)
- Rabi** : **Rice – Medium duration variety – TKM 13**
- Post monsoon** : Pulses/Maize/Groundnut/Vegetables

Treatments:

Kharif and Post monsoon season crops:

1. DI at 75 % PE with RDF through fertigation.
2. DI at 100% PE with RDF through fertigation
3. DI at 125 PE with RDF through fertigation
4. Conventional method.(surface irrigation as per CPG)

Rabi– Rice crop:

1. DI at 100 PE with RDF through fertigation
2. DI at 150 PE with RDF through fertigation.
3. DI at 200 PE with RDF through fertigation.
4. Conventional method – (surface irrigation as per CPG)

MI Layout:

Standard Layout for the entire cropping system:

63 mm Main

40 mm Sub-main

16 mm inline laterals

30 cm dripper spacing with 4LPH

90 cm in between laterals.

Control tap to be provided in laterals for differential dripping as per treatments.

Duration: Two Years (2019-20 & 2020-21)**Observations to be recorded:**

Growth and Yield parameter and yield.

1. Water requirement in DI compared to conventional check.
2. Weather parameters
3. Economic analyses.

Method of land preparation:

Land prepared by chisel ploughing followed by disc, tiller and rotavator to bring the soil to fine tilth condition.

Co-ordinating centre& Scientist In-charge:	Water Technology Centre, TNAU, Coimbatore	Dr. S. Panneer Selvam, Director, WTC
Centres& Scientist In-charge:	ARS, Bhavanisagar	Dr. N. K. Prabhakaran, Professor (Agronomy) & Head
	AC & RI, Madurai	Dr. S. Sakthivel, Professor (Agronomy)
	AC&RI, Killikulam	Dr. M. Joseph, Associate Professor (Agron.)
	SWMRI, Thanjavur	Dr. S. Porpavai, Professor (Agron.) & Head
	RRS,Tirur	Dr. V. M. Sankaran, Professor (Agron.) & Head

Proposed cropping programme for different centres

ARS, Bhavanisagar	:	Maize- Rice - Onion
AC&RI, Madurai	:	Maize- Rice - Onion
AC&RI, Killikulam	:	Maize- Rice - Blackgram
SWMRI, Thanjavur	:	Maize- Rice - Blackgram
RRS, Tirurkuppam	:	Maize- Rice – Vegetable cowpea

Action Plan 4. Rice mechanisation for different soil types of Tamil Nadu for higher rice productivity and profitability

Main plot: Soil types (3)

- Clay loam
- Sandy clay loam
- Sandy loam

Sub-plot: Transplanters (5)

- Walking type (4 rows)
- Riding type (4 rows)
- Riding type (6 rows)
- Riding type (8 rows)
- Yanji (8 rows)

Sub-sub plot: Weeders (3)

- Cono-weeder
- Single row power weeder
- Double row power weeder

Design: Strip-plot

Variety: TKM 13

Duration: Two Years (2019-20 & 2020-21)

Co-ordinating centre& Scientist In-charge:	AEC&RI, Kumulur	Dr. S. Vallal Kannan, Assistant Professor (Agronomy)
Centres& Scientist In-charge:	AC & RI, Madurai	Dr. E. Subramanian, Assistant Professor (Agronomy)
	AC&RI, Killikulam	Dr. M. Hemalatha Associate Professor (Agronomy)
	TRRI, Aduthurai	Dr. S. Elamathi , Assistant Professor (Agronomy) Dr. C. Umamageswari, Assoc. Prof. (Agron)
	ARS, Bhavanisagar	Dr. N. Satheesh Kumar, Assistant Professor (Agronomy)
	RRS, Ambasamudram	Dr. S.R. Shri Rangasami, Assistant Professor (Agronomy)

Observations to be recorded:

- No. population/m², Weed count, Weed control efficiency, Growth & yield parameters, Yield and Economics, Machine efficiency

Action plan 5. Demonstration of STCR-IPNS based fertilizer prescription for rice in Cauvery Delta Zone**Rationale:**

- Avoids over or under usage of fertiliser inputs; Ensures site specific & balanced nutrient supply
- Nutrient requirement of the crop, nutrient contribution from soil, fertilizer and organic manure are taken care of.
- Efficient fertilizer use and sustained soil health and productivity

Objective:

- To demonstrate the benefits of STCR-IPNS technology

Treatments

1. STCR-IPNS
2. Blanket recommendation
3. Farmer's Practice

Observations:

- Initial & post harvest soil fertility status and Grain yield

Duration : Two Years (2019-20 & 2020-21)**Location : KVK, Needamangalam**

Co-ordinating centre & Scientist In-charge:	Dept SS&AC, TNAU, Coimbatore	Dr. S. Maragatham Associate Professor (SS&AC)
	KVK, Needamangalam	Dr. A. Anuradha Assistant Professor (SS&AC)

Action plan 6: Development of foliar formulations for yield enhancement in rice under irrigated, water deficit and high temperature conditions.**Rationale:**

- Water deficit and heat can reduce productivity and yields in rice leading to lower income for farmers. In order to produce more productivity, the mitigation of both stresses is important to achieve the designated goals.
- In recent times foliar formulations have been found to be effective in mitigating water deficit and high temperature induced damages in rice plant.
- Any strategies if evolved involving foliar spray with nutrients/growth promoters will sustain the physiological and biochemical mechanism of the plants and protect them from ill effects from water deficit and high temperature thereby enhancing yield.

Objectives

- To develop the foliar formulations for yield enhancement in rice.
- To test and identify the foliar formulations based on morphological and physiological mechanism in rice under irrigated, water stress and high temperature conditions.
- To find out the cost effective foliar formulation for better yield and quality in rice.

Technical Programme (Objective wise & year wise)

Methodology and treatments:

Foliar application of three different formulations (Rice F1, Rice F2 and Rice F3) will be tried during active tillering stage and 15 days after first application. These will be applied in irrigated, drought and high temperature imposed plants and the following observations will be recorded.

Observations to be recorded:

Physiological characters

Membrane integrity, Chlorophyll stability index, Fv/Fm ratio, Relative water content, Photosynthetic efficiency, Canopy temperature.

Yield and Yield components

Total dry matter accumulation, No. of productive tillers, Panicle length & weight, Spikelet fertility (%), Grain yield (kg/ha), BC ratio.

Duration: Three Years (2019-20 to 2021-22)

Work Plan:

I year: (2019-2020)

1. Development of foliar formulations for yield enhancement in yield of rice.

II year: (2020-2021)

1. Identification and testing of suitable foliar formulation for rice based on morphological and physiological changes in crops under normal and water stress environments.

III year: (2021-2022)

1. Confirming the efficacy of identified foliar formulation for drought and high temperature stress management and sustained yield in rice.
2. Finding out the cost effective foliar formulation for better yield and quality in rice.

Co-ordinating centre	Department of Crop Physiology, TNAU, Coimbatore-3 (Objectives 1 to 3) Dr. D. Vijayalakshmi, Associate Professor (Crop Physiology) Dr. V. Ravichandran, Associate Professor (Crop Physiology) Dr. K. Vanitha, Assistant Professor (Crop Physiology) Department of Rice, TNAU, Coimbatore-3 Dr. K. Krishana Surendar, Assistant Professor (Crop Physiology)
Centres& Scientists	AC & RI, Madurai (Objective 3 only) Dr. T.S. Sivakumar, Associate Professor (Crop Physiology) AC & RI, Killikulam (Objective 3 only) Crop Physiologists AC & RI, Echangkottai (Objective 3 only) Dr. P. Boominathan, Associate Professor (Crop Physiology) Dr. C. Tamilselvi, Assistant Professor (Crop Physiology)

Action plan 7. Assessment on morphological characters and seed storage potential of traditional rice varieties

Objectives

- Documenting morphological characters of traditional rice varieties as per the DUS guidelines.
- Assessing the status of seed dormancy.
- Evaluating the physiological and biochemical seed quality attributes.
- Assessing the seed storage potential.

Methodology

- Collection of traditional rice varieties from different zones of Tamil Nadu.
- Raising crop for seed multiplication.
- Documentation of phenotypic characters as per DUS guidelines.
- Determining the physiological and biochemical properties *viz.*, seed germination, vigour potential, phenolic compounds, protein and carbohydrate content, amylase and dehydrogenase enzyme activity.
- Assessing the storage potential of seeds under ambient conditions.

Duration: Two Years (2019-20 & 2020-21)

Co-ordinating centre& Scientist In-charge:	Department of SS&T, TNAU, Coimbatore	Dr.K.Raja, Associate Professor (SST) Dr.D.ThirusenduraSelvi, Assistant Professor (SST)
Centres& Scientist In-charge:	TRRI, Aduthurai	Dr.N.Punithavathy, Associate Professor (SST)
	AC&RI, Madurai	Dr.C.Menaka, Associate Professor (SST)
	ADAC&RI, Trichy	Dr.T.Eevera, Assistant Professor (SST)

Action Plan 8. Redefining ODV standards for foundation and certified seeds of rice varieties.

Objectives

- To redefine the norms for ODVs (No / kg) in foundation and certified seed class of rice.

Plan of work:

- Conducting seed production experiments with permissible limit of field standards.
- Assessing the corresponding ODV limits in resultant seeds.

Varieties: Short duration, medium duration and long duration

Duration: Two Years (2019-20 & 2020-21)

Co-ordinating centre & Scientist In-charge:	Seed Centre, TNAU, Coimbatore	Dr. C. Vanitha, Assistant Professor (SST)
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V. PROJECT WISE REMARKS

Action Plan

Sl. no	TITLE	Scientist involved / Lead scientist	Duration	Remarks
1.	DCM/ADT/AGR/RIC/2016/001: Comparative performance of different crop establishment methods for Rice - Rice - Black gram cropping system	Lead Centre Dr. C.Umamageshwari, Associate Professor [AGR], TRRI, Aduthurai	2016-2019	<ul style="list-style-type: none"> • Results given for Adoption • Project to be closed
2.	DCM/ADT/AGR/RIC/2016/002: Alternate cropping system for Cauvery Delta Zone	Lead Centre Dr.M.Raju, Assoc. Professor [AGR], TRRI, Aduthurai	2016-2019	<ul style="list-style-type: none"> • Results given for Adoption • Project to be closed
3.	DCM/PMK/AGR/RIC/2016/001: Traditional rice cultivation through organics under rainfed ecosystem	Lead Centre Dr. S. Sakthivel, Professor (Agron.) & Head, Agrl. Research Station, Paramakudi	2017-2019	<ul style="list-style-type: none"> • Results given for Adoption • Project to be closed
4.	NRM/CBE/SAC/RIC/2016/001: Screening short duration rice genotypes for high grain Zn enrichment through mineral Zn fertilization	Lead Centre Dr.T. Chitdeshwari, Prof. (SS&AC), TNAU	2017-2019	<ul style="list-style-type: none"> • Results given for Adoption • Project to be closed
5.	NRM/TRY/SAC/RIC/2016/001: Development of technology for improving the productivity in Sodic Soil under water scarce condition.	Lead Centre Dr.P.Balasubramaniam P&H(SS&AC) ADAC&RI, Trichy	2016-2019	<ul style="list-style-type: none"> • Project to be continued for one more year • Proposal should be submitted for extension and change of project leader
6.	DCM/CBE/CRP/RIC/2016/001: Improvement of grain filling in rice through foliar spray of nutrients and growth promoter	Lead Centre Dr. V. Ravichandran, Asst. Prof. (CRP), Dept. of Crop Physiology, TNAU, Coimbatore	2016-2019	<ul style="list-style-type: none"> • Results given for Adoption • Project to be closed

OFT

1.	Mechanized semidry rice cultivation and weed management	Lead Centre Dr.S.VallalKannan, Asst.Professor(Agron), AEC&RI, Kumulur	2018-2019	<ul style="list-style-type: none"> Seed hardening treatment may be included and proposed as a package for adoption
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UNIVERSITY RESEARCH SUBPROJECTS

1.	DCM/PAI/AGR/RIC/2015/001: Pre and post emergence herbicide with mechanical weeding on weed management in drum seeded rice.	Dr.C.Sivakumar Associate Professor (Agronomy) Department of Agronomy AC&RI, Vazhavachanur	2015-2017	<ul style="list-style-type: none"> To be proposed for OFT atVazhavachanur, Tirur, AduthuraiBavanisagar, Killikulam, Ambasamudram, Maduraicentres
2.	NRM/ADT/SAC/RIC/2017/001: Permanent Manurial Experiment in RiceBased Cropping System	Dr.K.SathiyaBama Associate Prof.(SS&AC) TRRI,Aduthurai	April 2017 to March 2022	<ul style="list-style-type: none"> Project to be continued To be given for information by combining the results with Madurai centre Treatment influence on microbial population and crop productivity may be included
3.	NRM/ADT/SAC/RIC/2017/002: Nitrogen Management for direct seeded rice in Kuruvai and Samba season	Dr.K.SathiyaBama Associate Prof.(SS&AC) TRRI,Aduthurai	Aug. 2017- March 2020	<ul style="list-style-type: none"> Project to be continued Synchronised sowing may be carried out at Thanjavur and Aduthuraicentres

4.	NRM/ KTM/ SAC/ RIC/ 2016/ 001: Evaluation of organic sources under safe AWDI method in transplanted rice.	Dr. M.Babu, Professor (SS& AC) SWMRI, Thanajvur	Aug. 2016- March' 2019	<ul style="list-style-type: none"> • Project to be continued for one more year and extension proposal to be submitted • Results to be given for information • Extension proposal to be submitted • Accountability of rainfall/ irrigation level to be taken up • Economics with partial budgeting to be included • Refinement of STCR equation may be carried out on discussion with AICRP-STCR Coimbatore centre
5.	NRM/ADT/SAC/RIC/2017/002 Nitrogen management strategies for direct seeded rice in kuruvai and samba seasons	Dr. M.Babu, Professor (SS& AC) SWMRI, Thanajvur	Aug. 2018- July 2021	<ul style="list-style-type: none"> • Project to be continued • Pooled analysis to be presented along with economics during CSM 2020.
6.	NRM/MDU/SAC/RIC/1975/001: Permanent Manurial Experiment on Rice	Dr.P.Saravana Pandian Professor (SS&AC) AC&RI, Madurai	Long term Experiment (Since 1975)	<ul style="list-style-type: none"> • Results to be given for information • Project to be continued by getting a new project No. for next five years. • Inclusion of STCR-IPNS in the treatments to be done • Compilation of data over 44 years and preparation of a compendium to be carried out.
7.	DCM/MDU/AGR/RIC/2018/001: Alternate crops for kuruvai (1 st crop) season as contingent plan in PeriyarVaigai command area under limited water resources	Dr. E. Subramanian Assistant Professor (Agronomy) Madurai	July 2017- June 2020	<ul style="list-style-type: none"> • Project to be closed after the conduct of OFT at Madurai, Thanjavur, Killikulam, Ambasamudram and Kumulurcentres
8.	NRM/MDU/AGM/RIC/2016/001: Development of multifunctional strains of azotobactor species for enhancing rice	Dr. K. Kumudha Professor &Head, Dept. of Agrl. Microbiology,	Oct 2016 to Sep 2019	<ul style="list-style-type: none"> • To be continued • Extension proposal to be submitted for one more year

	productivity	AC&RI, Madurai		
9.	NRM/CBE/AGM/2018/CP015:(Core Project) Multifunctional Bacillus altitudinis FD48 for drought protection, plant growth promotion and productivity	Dr.U.Sivakumar Professor, Dept. of Agrl. Microbiology, DNRM, TNAU, Coimbatore.	Sep 2018 to Oct2019	<ul style="list-style-type: none"> To be continued The research work to be fastened
10.	NRM/CBE/AGM/2018/CP066:(Core Project) Phyllospheric yeast as a growth stimulant and drought mitigating inoculants for crops	Dr.D. Balachandar Professor, Dept. of Agrl. Microbiology, DNRM, TNAU, Coimbatore.	Nov 2018 to Oct 2019	<ul style="list-style-type: none"> To be continued The research work to be fastened.
11.	NRM/CBE/AGM/YST/2018/CP065:(Core Project) Assessment of soil yeast diversity and functionality for the sustainable soil health improvement	Dr.R.Parimaladevi Dr.M.Malarkodi Dept. of Agrl. Microbiology DNRM, TNAU, Coimbatore.	Nov 2018 to Oct 2019	<ul style="list-style-type: none"> Project to be continued The research work to be fastened
12.	SEC/CBE/SST/RIC/2018/CP 074:(Core Project) Prevention of pre-harvest sprouting by inducing temporary dormancy in rice varieties	Dr.J. Renugadevi, Professor (SST)	June 2018 to May 2019	<ul style="list-style-type: none"> To be continued Rainfall simulation to study the sprouting situation to be attempted Economics to be worked out
13.	SEED/BSR/SST/RIC/2017/001: Evaluating an integrated management approach against angoumois grain moth (<i>Sitotrogacerealella</i>) infestation to improve rice seed storability.	Dr. R.Vigneshwari, Asst. Professor (SS&T) Dr. SheelaVenugopal, Asst. Professor (Ento.)	December 2016 - December 2018	<ul style="list-style-type: none"> To be continued Results to be given for information Extension proposal to be submitted Economics to be worked out
14.	DCM/CBE/CRP/CSF/2018/CP 009:(Core Project) Development of crop specific foliar formulation for yield enhancement in rice under normal and stress environment	Dr. C.N. Chandrasekaran	2018-19	<ul style="list-style-type: none"> To be continued

AICRP

1.	AICRP/ PBG/ADT/RIC/002: 1.Nutrient response trials on selected AVT – 2 (Mid early) rice culture under high and low input management	Dr. S.Elamathi Assistant Professor (Agron.)TRRI, Aduthurai.	2018-19	• To be continued
2.	Nutrient response trials on selected AVT – 2 (Late) rice culture under high and low input management		2018-19	• To be continued
3.	Evaluation of different nutrient management practices for enhancement of productivity in different rice establishment method		2017-19	• To be continued
4.	Conservation Agriculture / system based management practices in rice and rice based cropping systems (crop diversification) to utilise the resources and enhancing the profitability and productivity		2017-19	• To be continued
5.	AICRP /PBG /CBE / RIC/ 003 Nutrient Management Trials-AVT 2- Nutrient response trials on selected AVT 2 rice cultures under high and low input management.	Dr. G. Senthil Kumar, Assistant Professor (Agron.) Dept. of Agronomy, TNAU, Coimbatore	2018-19	• To be continued
6.	Nutrient Management Trials – AVT 2 – Bio-fortified Nutrient response trials on selected AVT 2 rice cultures under high and low input management.		2018-19	• To be continued

7.	Yield Enhancement Trial (YET 3) Nutrient and weed management for higher productivity in different rice establishment methods (conventional transplanting, mechanized transplanting, SRI)		2018-19	<ul style="list-style-type: none"> To be continued
8.	Yield Enhancement Trial (YET 4) Enhancing the productivity of direct seeded rice with iron coating under different rice ecologies		2018-19	<ul style="list-style-type: none"> To be continued
9.	AICRP/NRM/TRY/005: Management of Salt Affected Soils and Use of Saline water in Agriculture (54D 32 BO)	Dr.A.ALAGESAN Assistant Professor (Agronomy)	2016-19	<ul style="list-style-type: none"> To be continued
10.	ICAR/DCM/CBE/SOA/2015/R001: Network Project On Organic Farming Title: Evaluation of response of different rice varieties suitable for organic farming.	Dr. E. Somasundaram Dept. of Sustainable Organic Agriculture, TNAU, Coimbatore	2016-19	<ul style="list-style-type: none"> To be continued Results to be given for information
11.	AICRP/DCM/CBE/AGR/001: Identification of need based Cropping system for Cauvery New Delta Zone	Dr. S.Porpavai, Professor (Agronomy), SWMRI,Thanjavur	2018-19	<ul style="list-style-type: none"> Project to be closed Results to be given for information
12.	ICAR/AICRP on WM/ Long term herbicide trial in transplanted lowland rice-rice cropping system	Dr. C. Chinnusamy Professor of Agronomy, Dept. of Agron., TNAU, CBE Dr.C.Bharathi Assistant Professor(SS&AC)	2018-19	<ul style="list-style-type: none"> Project to be closed Results to be given for information
13.	AICRP/NRM/CBE/SAC/002: AICRP on Soil Test Crop Response - Long term STCR-IPNS Experiment on rice-rice sequence.	Dr. S.Maragatham Associate Professor (SS&AC) Department of Soil Science and Agricultural Chemistry, DNRM, TNAU, Coimbatore-3.	Long term (Since 1998)	<ul style="list-style-type: none"> Project to be continued

14.	AICRP/NRM/CBE/SAC/004: Assessing the influence of P build up on the availability of Zn in soils and its role in affecting Zn nutrition of rice and its productivity	Dr.T.Chitdeshwari, Professor (SS&AC) Dept. of Soil Science &Agrl. Chemistry,DNRM,TNAU, Coimbatore	2018 - 2020	<ul style="list-style-type: none"> • Project to be continued
15.	AICRP/PBG/CBE/RIC/003: Influence of silicon solubilizers on growth, physiology and induced stress tolerance in rice genotypes	Dr.V.Ravichandran Assistant Professor (Crop Physiology), Department of Rice, Coimbatore.	2018-19	<ul style="list-style-type: none"> • Project to be continued
16.	Physiological evaluation of Nitrogen Use Efficient promising rice genotypes			<ul style="list-style-type: none"> • To be continued • Results to be given for information
17.	Physiological characterization of selected rice genotypes for multiple abiotic stress tolerance			<ul style="list-style-type: none"> • To be continued • Results to be given for information

EXTERNALLY FUNDED PROJECTS

1.	JAPAN/ DCM/ ADT/ AGR/ 2016/ R006: Estimation of regional global methane emission and refinement of its estimation by GOSAT-2 and surface observation: Phase II	PI: Dr. V. Ambethgar, Direcor, TRRI, Aduthurai Dr. C. Umamageswari, TRRI, Aduthurai	Feb 2016 to 2020-	<ul style="list-style-type: none"> • Project to be continued
2.	PPV/SC/CBE/SST/2003/R001: DUS test centre for Rice and Sunflower under PPV & FR Authority at the Department of Seed Science and Technology, TNAU, Coimbatore	Dr. R. Jerlin, Prof. (SST) & Head, Coimbatore Dr. K. Raja, ASP (SST) Dept. of Seed Science, TNAU, Coimbatore	Feb 2004 to till date	<ul style="list-style-type: none"> • Project to be continued
3.	JAPAN/CM/CBE/CRP/2016/R002: Multi- site monitoring network of canopy micrometeorology and heat stresses of rice under the climate change	Dr. D. Vijayalakshmi, Dept. of Crop Physiology, TNAU, Coimbatore.	-	<ul style="list-style-type: none"> • Project to be continued
4.	DST/DCM/ADT/CRP/2017/R001: Physiological evaluation of rice genotypes for multiple stress tolerance	Dr. K. Vanitha Asst. Prof. (CRP), TRRI, Aduthurai	2016-19	<ul style="list-style-type: none"> • Project to be continued

5.	GOTN/NRM/AGM/CBE/2018/D003: NMSA Project: Strengthening biofertilizer production units for stage-specific inoculant production for rice.	Dr. P. Marimuthu Dr.D.Balachandar Dr.R.Parimaladevi Dr.K.Kumudha Dept.ofAgrl.Microbiology, DNRM,TNAU,Coimbatore	Nov 2018 to Oct 2019	<ul style="list-style-type: none"> • Project to be continued
6.	MHRD/NRM/CBE/AGM/2014/R015: Centre of Excellence in Frontier areas of Science and Technology (FAST) on microbes to feed the world: Plant-Microbe interactions to boost Agricultural Production (E28 YJ)	Dr.U.Sivakumar, Prof., Dept. of Microbiology, DNRM, TNAU, Coimbatore.	Oct 2014- March 2020	<ul style="list-style-type: none"> • Project to be continued

C. CROP PROTECTION

I. Specific recommendations

- ❖ All the scientists are instructed to monitor the insect pests and diseases of rice in their districts constantly. Monthly Pest and disease surveillance report should be submitted to the Director (CPPS) on or before 25th of every month without fail.
- ❖ The dates given for sending the closure proposal / deletion proposal should be strictly adhered.
- ❖ Based on the thrust area identified new URP should be submitted by the concerned scientists on or before 30.06.2019. All proposals should be presented before the RPAC convened by the Director (CPPS) before getting final approval.
- ❖ Involving PG and Ph.D students, basic work on mechanism of resistance, effect of cropping systems on pests and diseases and their natural enemies, insect plant interaction, host pathogen interaction and induced systemic resistance should be taken up.

II. General recommendations

RESULTS FOR ADOPTION, OFT AND INFORMATION

a. Technology for Adoption

- Rice + sunflower (or) rice + cowpea (or) rice + sesame cropping system with soil incorporation of either FYM (12.5 t/ha) or vermicompost (2.5 t/ha) and amendment with neem cake 250 kg / ha. and azophos (2 kg/ha) (If azophos is not available, *Azospirillum* 2 kg/ha + *Phosphobacteria* 2 kg/ha can be applied).
- Increased attraction, conservation and virulent activities of entomophages, increased natural suppression of pests, maximum pest defender and occurrence ratios , and minimum preference ratio, moderate yield and CBR.

b. Technology for OFT

1. Evaluation of Plant origin oil against yellow stem borer

Treatments

1. Camphor oil 1000ml/ha
2. Neemazal 1000ml/ha
3. Chlorantraniliprole 150 ml/ha
4. Untreated control

Centres to be involved:

ADT (Dr. P. Anandhi), CBE (Dr. V. Balasubramani), KKM (Dr. L. Alwin), TRY (Dr. S. Sheeba Joyce Roseleen), MDU (Dr. Zadda Kavitha)

Treatment spraying: Two spray at 30th& 45th DAT

Observations: 7th, 14th, 21st days after spraying and harvest stage for stem borer damage

1. Management of sheath rot and grain discolouration in rice

Treatments

1. Seed treatment with *Pseudomonas fluorescens* (Pf1) @ 10g/kg + one foliar spray with Azoxystrobin @ 0.2 % at 50 per cent flowering.

2. Seed treatment with *Pseudomonas fluorescens* (Pf1) @ 10g/kg + one foliar spray with Carbendazim +Thiram+ Mancozeb (1:1:1) @ 0.2 % at 50 per cent flowering.
3. Absolute control

Observations to be recorded: Disease incidence and yield

Centres: RRS, Thirupathisaram; TRRI, Aduthurai ; ADAC& RI, Trichy, RRS, Tirur

2. Management of blast disease through combination fungicides

Treatments

1. Foliar spraying of Azoxystrobin + Difenoconazole @ 0.1 % at the time of symptom appearance
2. Foliar spraying of Zineb + Hexaconazole @ 0.25 % at the time of symptom appearance
3. Foliar spraying of Tricyclazole @ 0.1 % at the time of symptom appearance
4. Absolute control

Observations to be recorded: Disease incidence and yield

Centre's: Dept. of Rice, CBE, TRRI, Aduthurai ; ADAC& RI, Trichy, AC &RI, Madurai; RRS, Ambasamudram

c. Results for Information

1. Resistant entries against major insect pests

Pests	Entries identified
Stem borer	ACK 13005, WRM 5, WRM 17, WRM 20 (ADT, CBE, TRY, TPS, BSR)
BPH	PHSS 17, 18 & 3 -(ADT & CBE)
Multiple Resistance (gall midge, stem borer and leaf folder)	NWGR 8001, WGL 1062, BPT 2782 (ADT)

2. Entries having multiple resistances to diseases

Sl.No	Source	Entries	Reaction to diseases
1	MLT I	102 (AD 16075)	MR - Blast , RTD
2	MLT I	104 (AD 16028)	MR - RTD
3	MLT I	106 (CB 14528)	R - RTD
4	MLT I	109 (CB 15085)	MR - Blast
5	MLT II	202 (AD (Bio) 13071)	MR - Sheath blight, Sheath rot
6	MLT II	203 (CB 15714)	MR Sheath blight, Sheath rot
7	MLT II	204 (AD 16037)	MR to Sheath blight, Sheath rot R – RTD
8	MLT II	207 (AD 16025)	MR to sheath blight and sheath rot
9	MLT II	209 (AD 15088)	MR to blast, BS and RTD
10	MLT II	210 (CB 15541)	MR blast, sheath blight, sheath rot, Brown spot and RTD
11	MLT II	211 (AD 13298)	MR to RTD
12	MLT II	212(AS14001)	MR to blast and R to RTD
13	MLT II	213 ACK(12022)	MR to blast and RTD
14	MLT III	301 (AD 13253)	R to sheath blight, sheath rot and MR to brown spot
15	MLT III	304 (ACK 14072)	MR to Blast and Brown spot

16	MLT III	305 (AD 15105)	MR RTD
17	MLT III	308 (AD 13299)	R to sheath rot and MR to brown spot
18	MLT III	309 (CB 13132)	R to sheath rot and MR to blast
19	MLT V	501(TR 13069)	MR To sheath blight sheath rot brown spot and RTD
20	MLT V	503 (TR 13083)	MR to blast and brown spot
21	MLT V	504 (TM 12039)	MR to RTD
22	MLT V	506 (CB 13804)	MR to blast and RTD
23	MLT V	507 (TM 120121)	MR to Brown spot
24	MLT V	508 (IR 64 dt QTL)	MR to blast and sheath rot
25	MLT V	509 (PM 16003)	MR to blast and RTD
26	ART – I	418-1 (AD 12132)	MR to blast sheath blight and sheath rot
27	ART – I	418-3 (TP 08053)	MR to RTD
28	ART – II	1018-1 (TM 12077)	MR to sheath blight and sheath rot
29	ART – II	1018-3 (TM 12061(R))	MR to sheath blight and SR
30	ART – III	1518-2 (CB 12132)	MR to BLB and RTD

3. Rice Stem borer Species Diversity

Based on the observations taken during panicle development stage of rice crop, in Kharif season pink stemborer was dominant in Thirupathisaram&Aduthurai but yellow stemborer was dominant at Coimbatore. In Rabi season, yellow stemborer was dominant in Thirupathisaram& Coimbatore but dark headed borer was dominant at Aduthurai.

Period	Stem borer species and Places	Percent incidence of different borer species		
		Coimbatore	Aduthurai	Tirupathisaram
Kharif -2018	Yellow stemborer	100.00	47.00	33.30
	Pink stemborer	0.0	52.00	65.87
	Dark headedborer	0.0	1.00	0.83
Rabi- 2018-19	Yellow stemborer	68.00	25.00	67.69
	Pink stemborer	32.00	25.00	31.26
	Dark headedborer	0.0	50.00	1.05

4. Emerging pests

a. Army worm (Rice swarming caterpillar)

- Sporadic outbreak noticed during this year at Ramanathapuram, Sivagangai and Kanyakumari
- Larva causes damage in young seedling in newly transplanted crop and direct sown paddy
- Larval damage cause reduction in plant population upto 100%

Recommendations: Irrigation management by flooding the field to kill the hiding larva. Spraying of Chlorpyriphos @ 1,250 ml/ha

b. Rice black bug

- Sporadic outbreak noticed during this year at Thanjavur and Thiruvarur district
- Unusual rainfall during August favours emergence of the insect

Recommendation: Neem seed kernel extract 5 % (25kg/ha).

c. Harvester termite

- Sporadic incidence noticed in upland rice crops

Recommendation: Chopped paddy straw treated with quinalphos 1.5D @ 50 kg/ha

Present: 1. Dr. K. Prabakar, Director, CPPS, TNAU, Coimbatore.
2. Dr. V. Ambedkar, Director, TRRI
3. Dr. N. Sathiah, Prof. & Head, Dept. of Agrl. Entomology, Coimbatore
4. Dr. M. Muthamilan, Prof. & Head, Dept. of Plant pathology, Coimbatore
5. Dr. K. Poornima, Prof. & Head, Dept. of Nematology, Coimbatore

The URPs, externally funded projects and students' theses work carried out by Crop Protection Scientists working in Rice were reviewed on 02.04.2019 and remarks offered.

III. Action plan (2019 -2020)

Experts present: The following experts were invited for finalising the action plan.

1. Dr. A. S.Krishnamoorthy, Registrar, TNAU, CBE
2. Dr. V. Ambethgar, Director, TRRI, Aduthurai
3. Dr. K.Prabakar, Director (CPPS), TNAU, CBE
4. Dr. M. Kalyanasundaram, Dean (Agri.), CBE
5. Dr. J. S. Kennedy, Dean, PGS, TNAU, CBE
6. Dr. T. Raguchandar, Dean (Students Welfare)
7. Dr. N. Sathiah, Professor and Head (Agrl.Ento), TNAU, CBE
8. Dr. M. Muthamilan, Professor and Head , Dept. of Plant Pathology, CBE
9. Dr. K. Ramaraju, Professor, (Agrl.Ento), TNAU, CBE
10. Dr. S. Suresh, Professor, (Agrl.Ento), TNAU, CBE
11. Dr. S. Jeyarani, Professor (Agrl.Ento), TNAU, CBE
12. Dr. G. Karthikeyan, Professor (Plant pathology), TNAU, CBE

Agricultural Entomology

Theme Area:

1. Prediction of changing insect pest scenario in rice ecosystems
2. Exploring insect resistance mechanisms
3. Pesticide residue monitoring in rice grains
4. Developing mass trapping technology for rice yellow stem borer
5. Herbivore induced plant volatiles (HIPV) – elicitor based pest management

Action Plan 1: Prediction of changing insect pest scenario

Theme Leader	Dr. P.Anandhi, Asst. Professor (Agrl. Entomology), TRRI, Aduthurai		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables
1. Keeping vigilance on emerging pests either through introduction or shift in pest status.	Dr. V. Balasubramani Professor (Entomology) TNAU, CBE	Continuing the vigilance on changing pest scenario, through regular surveys.	Forewarning on emerging pests.
2. Assessment of insect pest and	Dr. G. Preetha, AP (Ento.)	Insect pests and natural enemies	Intervention with suitable IPM package.

<p>natural enemies population <i>in situ</i>, light and pheromone trap. 3. Impact of light trap on non target arthropods.</p>	<p>AC&RI, KKM Dr. J. Jayaraj, AC & RI, MDU Dr. Sheela Venugopal, Asst. Professor (Ento.) ARS, BSR Dr. Sheeba Joyce Roseleen, AP (Ento.) ADAC & RI, TRY Dr.V.A. Vijayashanthi AP (Ento.), KVK, Tirur</p>	<p>data from light trap and <i>in-situ</i> counts Key pest monitoring Recording of weather parameters Correlation and regression analysis</p>	
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Action Plan 2. Exploring insect resistance mechanisms

Theme Leader	Dr. V. Balasubramani , Professor (Agrl. Entomology), TNAU, CBE		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables/ expected out come
<p>1. Identification of resistance sources for major insect pests. 2. Investigation of resistance mechanisms</p>	<p>Dr. P.Anandhi, AP (Ento.) TRRI, Aduthurai Dr. M. Ravi, AP (Ento.) AC & RI, KKM Dr. G. Srinivasan, ASP (Ento.) AC & RI, MDU Dr. Sheela Venugopal Asst. Professor (Ento.) ARS, BSR Dr. Sheeba Joyce Roseleen, Asst. Professor (Ento.) AC & RI, TRY</p>	<p>Investigating bio-physical and biochemical bases of resistance. Each centre will work on the specified insects for HPR studies CBE – BPH & SB ADT- BPH & SB KKM – SB MDU – LF & SB BSR – LF & SB TRY – LF & SB</p>	<p>Resistant donors for breeding programme can be identified.</p>

Action Plan 3. Pesticide residue monitoring in rice grains

Theme Leader	Dr. J.S. Kennedy , Dean (SPGS), TNAU, Coimbatore		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables/ expected out come
Pesticide residue monitoring in rice grains	Dr.J.S.Kennedy Dean (SPGS) Dr.A.Suganthi, AP (Ento.) TNAU, Coimbatore	Residue level of major pesticides in samples of Coimbatore and Aduthurai will be analysed at Coimbatore Centre.	For monitoring residues of important insecticides in popular rice varieties

Action Plan 4. Developing mass trapping technology for rice stem borer

Theme leader	Dr. K. Premalatha , Asst. Professor (Agrl. Ento.), AC & RI, MDU		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables/ expected out come
Standardization of mass trapping technique for rice yellow stem borer	Dr.N.Muthukrishnan, Professor (Agrl. Entomology) Coimbatore Dr. P. Anandhi, AP (Ento.) TRRI, Aduthurai Dr.K. Elanchezhan AP (Ento.), AC&RI, KKM Thirupathisaram Dr.Sheeba Joyce Roseleen, Asst. Professor (Ento.) AC&RI, Trichy	Standardization of trap density for mass trapping (10, 15, 20, 25 traps/ac) Pheromone traps will be supplied from Dept. of Agrl. Entomology, Coimbatore with septa purchased under schemes/main.	Information on number of traps required per unit area for mass trapping will be available, as a contingent strategy during outbreaks.

Action Plan 5. Herbivore induced plant volatiles (HIPV) – elicitor based pest management

Theme leader		Dr. N. Muthukrishnan , Professor (Agrl. Entomology), TNAU, CBE	
Activity	Name of the Scientist and Centre	Activity	Name of the Scientist and Centre
Identification of HIPV – elicitor for pest management	Dr.N.Muthukrishnan Professor (Ento.) Coimbatore & Aduthurai Dr.K.Premalatha, Asst. Professor (Agrl. Entomology)AC&RI, Madurai	Identification of HIPV – elicitor for pest management	Dr.N.Muthukrishnan Professor (Ento.) Coimbatore & Aduthurai Dr.K.Premalatha, Asst. Professor (Agrl. Entomology)AC&RI, Madurai

Theme leader		Dr. N. Muthukrishnan , Professor (Agrl. Entomology), TNAU, CBE	
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables/ expected out come
Identification of HIPV – elicitor for pest management	Dr.N.Muthukrishnan Professor (Ento.) Coimbatore & Aduthurai Dr.K.Premalatha, Asst. Professor (Agrl. Entomology)AC&RI, Madurai	Laboratory evaluation of elicitors on the biology of stem borer and leaf folder Field evaluation of elicitors on the population dynamics of pests and natural enemies	Information on HIPV & Elicitor based pest management strategies will be available

Plant Pathology

Theme Area

1. Disease monitoring, surveillance, epidemiological studies on rice diseases and Forewarning.
2. Identification and mechanism of resistance sources for major pests and diseases.
3. Management of grain discolouration and aflatoxin through botanicals.

Action Plan 1:

Disease monitoring, surveillance, epidemiological studies on rice diseases and forewarning

Theme Leader	Dr. A. Ramanathan, TRRI, Aduthurai		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables/ expected out come
Monitoring of rice diseases under irrigated and direct sown rice (Blast, sheath blight, sheath rot, bacterial blight, brown spot, grain discolouration and false smut) diseases along with GPS data	Dr. C. Gopalakrishnan Professor (Pathology) Dept. of rice, CBE Dr. N. Revathy Assoc. Professor (Plant Pathology) AC&RI, Madurai Dr. K.Chitra Asst. Professor (Plant Pathology) ADAC&RI, TRY Dr. M. Jayasekhar Professor (Plant Pathology) ARS, TPS Dr. N. Rajinimala Asst. Professor (Plant Pathology) AC&RI, KKM. Dr.R.Ramjegathesh Assistant Professor (Pl.Pathology) RRS, ASD Dr. S. Malathy, AP (Pl. Path.) RRS, Tirur	Per cent disease incidence / PDI as per standard grades. Correlation and regression analysis of pest and disease progression during cropping periods in relation to weather parameters. Regular bulletins on pest and disease scenario in the particular zone should be given for the benefit of farmers through press and media marking a copy to Director (CPPS).	Timely monitoring of disease epidemics and fore-warning of farmers and line departments.

Action Plan 2: Identification and mechanism of resistance sources for major pest and diseases

Theme Leader	Pathology: Dr. C. Gopalakrishnan, TNAU, Coimbatore		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables
Identification of resistant sources for major diseases (Blast, sheath blight, sheath rot, bacterial blight, brown spot, false smut and grain discolouration)	Dr. A. Ramanathan, Professor (Pl. Patho.) TRRI, Aduthurai Dr. N. Revathy, Assoc. professor (Pl. Patho.) AC&RI, Madurai Dr. M. Jayasekar, Prof. (Pl. Patho.), ARS, TPS Dr. R. Ramjegathesh, Assistant Professor (Pl.Pathology) RRS, Ambasamudram Dr. S. Malathy, AP (Pl. Patho.)RRS, Tirur	Multiple resistant entries for both pests and diseases natural and artificial conditions (wherever possible)	Multiple resistant donors for breeding programme will be identified

Action Plan 3: Management of grain discolouration and aflatoxin through botanicals

Theme Leader	Dr. N. Rajinimala, AC &RI, Killikulam		
Activity	Name of the Scientist and Centre	Observations to be recorded	Deliverables
Evaluating botanicals including plant oils, oil cakes for the management of grain discolouration	Dr. A. Ramanathan, Professor (Pl. Patho.) TRRI, Aduthurai Dr. C. Gopalakrishnan, Professor (Pathology) Dept. of Rice, CBE Dr. N. Revathy, Assoc. professor (Pl. Patho.)	Per cent disease index Extent of aflatoxin contamination in grains	To develop suitable organic methods of rice disease management

	AC&RI, Madurai Dr. N. Rajinimala, Asst. Prof. (Pl. Patho.) AC&RI, KKM Dr. R. Ramjegathesh, Assistant Professor (Pl.Pathology) RRS, Ambasamudram Dr. S. Malathy, AP (Pl. Patho.) RRS, Tirur		
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IV. Project wise report

Remarks on the ongoing University Research Projects

1. AGRICULTURAL ENTOMOLOGY

Sl. No.	Project No. and Title	Remarks
1	CPPS/CBE/ENT/RIC/2016/001/294 Developing ecological engineering methods for enhancing rice entomophages and pest management under zero insecticide condition Dr. N. Muthukrishnan , Professor (Agrl. Entomology) (Jun. 2016 to May 2019)	Completion report is to be prepared and submitted on or before 31.06.2019. Publications may be made in peer reviewed journals and a copy (both soft and hard copies) may be sent to the Director, CPPS for record.
2	CPPS/CBE/DOR/ENT/RIC/2016/001/ 295 : Standardization of artificial screening and identification of resistant sources for yellow stem borer, <i>Scirpophagaincertulas</i> in rice. R. P. Soundararajan , Assoc. Professor (Agrl. Entomology) (Oct. 2016 to Sep. 2019)	Project may be closed by Sep.2019. The results may be published in peer reviewed journals and a copy (both soft and hard copies) may be sent to the Director, CPPS for record.
3	CPPS/CBE/ENT/RIC/2018/ CP017 : Ecological engineering for rice Dr. N. Muthukrishnan , Professor (Agrl. Entomology) June 2018 to May 2020	Project may be continued.
4	CPPS/BSR/ENT/RIC/2016/001 Evaluation of eco-friendly methods against rice yellow stem borer. Dr. Sheela Venugopal , Assistant Professor (Agrl. Entomology) (Sep. 2016 to Aug. 2019).	Project may be deleted as the components tested are already in recommendations. New URP should be submitted based on the thrust area identified.
5	CPPS/TNJ/ENT/RIC/2016/001/351 : Exploring rice stem borer diversity, plant resistance sources and its management through habitat diversification in Thanjavur belt. Dr.R.Nalini , Professor (Agrl. Entomology) (Jun.2016 to May 2019)	Completion report is to be prepared and submitted on or before 31.06.2019. Publications may be made in peer reviewed journals and a copy (both soft and hard copies) may be sent to the Director, CPPS for record.

6	CPPS/TNJ/ENT/RIC/2017/001/518: Developing a bio-intensive insect pest management module for organic rice cultivation. Dr.R.Nalini , Professor (Agrl. Entomology) (Aug. 2017 to Jul. 2020)	Project may be closed and completion report is to be submitted with the available information as the project leader is transferred.
7	CPPS/TPS/ENT/RIC/2016/001: Pest management strategies for the changing rice pest scenario in Kanyakumari District Dr.G.Preetha , Asst. Professor (Agrl. Entomology) (Oct. 2016 to Sep. 2019)	Project may be continued.
8	CPPS/TPS/ENT/RIC/2017/001: Insecticide resistance monitoring of rice pink stem borer, <i>Sesamia inferens</i> (Walker) Dr. G. Preetha , Asst. Professor (Agrl. Entomology) (Aug. 2017 to Jul. 2020)	Project may be deleted as artificial rearing was not successful even after repeated attempts. New URP should be submitted based on the thrust area identified on or before 31.05.2019.
9.	CPPS/TRY/ENT/RIC/2018/CP093: Exploring the effectiveness of newer insecticides and its detoxifying mechanisms for the management of Stem borer complex in rice. Dr. Sheeba Joyce Rosleen , AP (Ento.) and Dr. G. Preetha , AP (Ento.) Sept, 2018 – Aug, 2021	Project may be continued.
10.	AICRP/PBG/CBE/RIC/003: All India Co-ordinated Rice Improvement Project – Entomology Part (Coimbatore) Dr. R. P. Soundararajan , Assoc. Professor (Agrl. Entomology)	Dr. R. P. Soundararajan is transferred to HC & RI(W), Trichy. Project may be continued with Dr. V. Balasubramani, AICRIP entomologist as PI
11.	AICRP/PBG/ADT/RIC/002 All India Co-ordinated Rice Improvement Project – Entomology Part (Aduthurai) Dr. P. Anandhi , Asst. Professor (Ento.)	Project may be continued

Plant Pathology

S. No.	Project No. and Title	Remarks
1	CPPS/CBE/PAT/RIC/2016/001 Assessing the occurrence and distribution of mycotoxins in rice. Dr. M. Karthikeyan , Asst. Professor (Plant Pathology) (Feb. 2016 – Jan. 2019)	The scientist is now working in Department of Vegetable crops, HC&RI, Coimbatore. Hence, deletion proposal may be sent on or before 03.05.19.
2	CPPS/TRY/PAT/RIC/2015/001 Combined effect of <i>Beauveria</i> and endophytic bacteria on stem borer (<i>Scripophagaincertulas</i> Walker) and sheath blight disease (<i>Rhizoctonia solani</i> Kuhn.) in rice. Dr. L. Karthiba , Asst. Professor (Plant Pathology) Dr. S. Sheeba Joyce Roseleen , Asst. Professor (Agrl. Entomology) (Apr. 2015 to Mar. 2018)	The scientist is currently working at Dept of Pulses, CPBG, Coimbatore. It is suggested to submit the completion report on or before 03.05.19. A copy of the publication (both soft and hard copy) from this URP may be sent to Director (CPPS) for documentation. Newly identified strains of endophytic bacteria may be deposited with IDA recognized culture collection centre (AITCC/ MTCC / ITCC) and accession number to be obtained. Reference culture to be deposited at Dept. of Plant Pathology, TNAU, Coimbatore.
3	CPPS/TPS/PAT/RIC/2015/001 Screening of rice cultures to major diseases and management of sheath rot and grain discolouration. Dr. M. Jayasekhar , Professor (Plant Pathology) (Sep. 2015 – Mar. 2018)	As the project period is over by Mar.2018, completion report may be submitted on or before 03.05.19. A copy of the publication (both soft and hard copy) from this URP may be sent to Director (CPPS) for documentation.
4	CPPS/TPS/PAT/RIC/2016/001. Studies on the impact of weather factors on the incidence of major rice diseases in Kanyakumari district. Dr. M. Jayasekhar , Professor (Plant Pathology) (September 2016- August 2018)	The project may be continued for one more year.
5	CPPS/ASD/PAT/RIC/2018/001. Eco - friendly management of blast and sheath blight diseases of rice. Dr. R. Ramjgathesh , Assistant Professor (Pl.Pathology) (May 2018 – April 2021)	Entomologist available in the station may be utilised for recording pest and beneficial insect's population in the field trials. Proposal for mid-term correction should be sent by including treatments suggested

		and observations to be recorded on or before 03.05.2019.
6	CPPS/ASD/PAT/RIC/2018/002. Management of bacterial leaf blight disease in rice. Dr. R. Ramjgathesh , Assistant Professor (Pl.Pathology) (June 2018 – May 2021)	Proposal for mid-term correction should be sent by including one additional treatment i.e. Copper hydroxide (0.25%) on or before 03.05.2019.
7	ACTR/TRY/PAT/14/001: Identification of sources of resistance in rice to major pests and diseases under salt stress conditions. Dr.K.Chitra , AP (Pl. Patho.) and Dr.Sheeba Joyce Rosleen , AP (Ento.) (Oct. 2014 – Sep. 2017)	Completion report is pending for more than 18 months and to be submitted on or before 03.05.2019. A copy of the publication (both soft and hard copy) from this URP may be sent to Director (CPPS) on or before 03.05.2019 for documentation. Dr.K. Chitra is requested to propose a new URP separately based on the theme area identified during CSM 2019 on or before 15.05.2019.
8	CPPS/ TRY/PAT/RIC/2015/001 Combined effect of <i>Beauveria</i> and endophytic bacteria on stem borer (<i>Scripophagaincertulas</i> Walker) and sheath blight disease (<i>Rhizoctonia solani</i> Kuhn.) in rice. Dr.Sheeba Joyce Rosleen , Asst. Professor (Agrl. Entomology) (Apr.2015 to Mar.2018)	Dr.Sheeba Joyce Rosleen is requested to propose a new URP separately based on the theme area identified during CSM 2019 on or before 15.05.2019.
9	AICRP/PBG/CBE/RIC/003: All India Co-ordinated Rice Improvement Project – Pathology Part (Coimbatore). Dr. A. Ramanathan , Professor (Pl. Pathology)	Dr. A. Ramanathan is transferred to TRRI, Aduthurai. Project may be continued with Dr. C. Gopalakrishnan, AICRIP pathologist as PI.
10	AICRP/PBG/ADT/RIC/002: All India Co-ordinated Rice Improvement Project – Pathology Part (Aduthurai) Dr. K.Rajappan , Professor (Pl. Pathology)	Dr. K. Rajappan is transferred to HC & RI (W), Trichy. Project may be continued with Dr. A. Ramanathan, AICRIP pathologist as PI.

Dr. A. Ramanathan, Dr. C. Gopalakrishnan, Dr. N. Rajanimala and Dr.S. Malathy were requested to propose URP on thrust area on or before 31.05.2019.

Nematology

1	AICRP/CPS/CBE/NEMM/003 All India Co-ordinated Project on Nematodes in Agriculture Dr. N. Swarnakumari , Asst. Professor (Nematology)	Project may be continued
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Closing remarks by The Vice-Chancellor

- Impact of TNAU released varieties in improving the economy of the state may be studied (Action: Director, CARDS)
- The validity of the data obtained from crop cutting experiments need to be ascertained and a mechanism has to be formulated to cross check the CCPC data at grass root level (Action: Director, CARDS).
- Steps should be taken to popularize COHM 6 maize as an alternate crop to *kuruvai* paddy in new Delta area (Director WTC through IAMP)
- Popularization of newly released special purpose rice VGD 1 may be done through IAMP (Director, WTC)
- To take proper action to popularize TNAU rice varieties to improve its spread, area wise in Tamil Nadu considering the popularity of non TNAU varieties among farmers (CPBG, DEE)
- Director, CARDS and Director CPBG may prepare a proposal to study the reasons for slow spread of TNAU varieties among farmers and to find the reasons for the same, so as to rectify the defects. (CARDS & CPBG)
- Mechanism may be developed to confirm the reliability of data generated under CCPC scheme at the cross root level to improve its impact (Director CARDS)
- Impact of various TNAU rice varieties on the economy of Tamil Nadu and India may be worked every year. (CARDS)
- Work on herbicide resistant rice may be intensified (CPMB&B)
- Gene pyramiding programme for multiple resistance may be given importance (CPMB&B)
- Resistance/Tolerance of varieties tested under artificial screening/controlled conditions may be revalidated under field conditions also (Director, CPPS)
- To enhance the availability of PPFM to farmers, a mechanism may be developed through Directorate of ABD (Director, DNRM)
- Cost effective, valuable and applicable recommendations and technologies may be developed

Director of Research

Way forward

Crop Improvement (CPBG, CPMB & Seed Centre)

1. Genomic Breeding – Green Super Rice
Integration of several traits (yield, grain quality, low inputs and wide adaptability) into one Genotype
2. Conversion of C₃ to C₄ Photosynthesis
Increase the intensity of veins in rice cultivars
3. Promote promising genotypes developed through molecular breeding
Adopt a standard operational protocol for the release of varieties
4. Efforts to avoid admixtures or genetic impurities in TNAU released varieties
Maintenance of genetic stocks

Crop Management (DCM, NRM & WTC)

1. Mechanized rice cultivation
Transplanting and weeding
2. Organic rice
Quality of grains, premium price and economics of production
3. STCR approach
Rationalization of fertilizer use in rice growing tracts of Tamil Nadu
4. Use of Remote Sensing for Digital Agriculture
Soil mapping, varietal spread, plant health monitoring, yield prediction and risk assessment
5. Exploitation of endophytes
Against abiotic and biotic stress management
6. More crop per drop of water
Water budgeting and crop planning

Crop Protection (Entomology, Pathology, Nematology)

1. Promote botanical formulations and biocontrol agents against pests and diseases
Plant derived compounds, biocontrol agents, predators and parasitoids
2. Development of technology capsule
Encapsulate promising technologies into one
3. Digitization of pests and diseases monitoring systems
Use of artificial intelligence, bio-imaging, biosensors for early detection

V. List of Participants

1.	Directors & Deans of Main Campus, TNAU, Coimbatore
2.	Director, TRRI, Aduthurai
3.	Dean, AC &RI, Madurai
4.	Dean, CSC&RI, Madurai
5.	Dean, ADAC&RI, Trichy
6.	Dean, AC&RI, Killikulam
7.	Dean, AEC&RI, Kumulur
8.	Dean, AC&RI, Vazhavachanur
9.	Dean, AC&RI, Eachankottai
10.	Dean, AC&RI, Kudumiyamalai

	Tamil Nadu Rice Research Institute, Aduthurai
1.	Dr. A. John Joel, Professor (PBG)
2.	Dr. D. Sassikumar, Assoc. Professor (PBG)
3.	Dr. R. Suresh, Asst. Professor (PBG)
4.	Dr. R. Pushpa, Asst. Professor (PBG)
5.	Dr. M. Raju, Assoc. Professor (Agronomy)
6.	Dr. C. Umamageswari, Assoc. Professor (Agronomy)
7.	Dr. S. Elamathi, Asst. Professor (Agronomy)
8.	Dr. K. Sathiya Bama, Assoc. Professor (SS&AC)
9.	Dr. P. Anandhi, Asst. Professor (Agr. Entomology)
10.	Dr. A. Ramanathan, Professor (Plant Pathology)
11.	Dr. R. Thilagavathi, Asst. Professor (Plant Pathology)
	Dept. of Rice, TNAU, Coimbatore
12.	Dr. K. Ganesamurthy, Professor and Head
13.	Dr. R. Saraswathi, Professor (PBG)
14.	Dr. R. Pushpam, Associate Professor (PBG)
15.	Dr. K. Amudha, Assistant Professor (PBG)
16.	Dr. G. Senthilkumar, Assistant Professor (Agronomy)
17.	Dr. K. Krishnasurender, Asst. Professor (Physiology)
18.	Dr. V. Balasubramani, Professor (Entomology)
19.	Dr. C. Gopalakrishnan, Professor (Pathology)
	Dept. of Agronomy, TNAU, Coimbatore
20.	Dr. C. Chinnusamy, Professor (Agronomy)
21.	Dr. N. Thavaprakash, Assoc. Professor (Agronomy)
22.	Dr. C. Bharathi, Asst. Professor (SS&AC)
	Dept. of Soil Science & Agr. Chemistry, TNAU, Coimbatore
23.	Dr. T. Chitdeshwari, Professor (SS&AC)
24.	Dr. S. Maragatham, Assoc. Prof.(SS&AC)
25.	Dr. D. Jagadeeswari, Assoc. Prof. (SS&AC)
	Dept. of Nano Science & Technology, TNAU, Coimbatore
26.	Dr. C. Sharmila Rahale, Asst. Prof. (SS&AC)
	Dept. of Crop Physiology, TNAU, Coimbatore
27.	Dr. D. Vijayalakshmi, Associate Professor (Crop Physiology)

28.	Dr. V. Ravichandran, Associate Professor (Crop Physiology)
29.	Dr. K. Vanitha , Asst. Prof. (Crop Physiology)
	Seed Centre & Dept. of Seed Science & Technology, TNAU, Coimbatore
30.	Dr. J. Renugadevi, Professor (SST)
31.	Dr. K. Raja, Assoc. Professor (SST)
	Dept. of Agrl. Microbiology, TNAU, Coimbatore
32.	Dr. V. Gomathi, Professor & Head
33.	Dr. D. Balachandar, Professor (Agrl. Microbiology)
34.	Dr. U. Sivakumar, Professor (Agrl. Microbiology)
	Dept. of Agrl. Entomology, TNAU, Coimbatore
35.	Dr. N. Sathiah, Professor and Head (Agrl. Entomology)
36.	Dr. N. Muthukrishnan, Professor (Agrl. Entomology)
37.	Dr. K. Poornima, Professor and Head (Nematology)
38.	Dr. N. Swarnakumari, Asst. Professor (Nematology)
	Dept. of Vegetable Crops, TNAU, Coimbatore
39.	Dr. M. Karthikeyan, Asst. Professor (Plant Pathology)
	Dept. of Plant Pathology, TNAU, Coimbatore
40.	Dr. N. Revathi, Assoc. Professor (Plant Pathology)
	Centre for Plant Molecular Biology & Bio Chemistry, TNAU, Coimbatore
41.	Dr. S. Mohankumar, Director (DPMB&B)
42.	Dr. R. Gnanam, Professor and Head DPB
43.	Dr. N. Kumaravadivel, Professor and Head (DPMB&B)
44.	Dr. D. Uma, Professor and Head (Biochemistry)
45.	Dr. D. Sudhakar, Professor, DPB
46.	Dr. M. Raveendran, Professor, DPB
47.	Dr. L. Arul, Professor, DPB
48.	Dr. N. Bharathi, Assistant Professor, DPMB&B
49.	Dr. M. Jayakanthan, Assistant Professor, DPMB&B
50.	Dr. N. Saranya, Assistant Professor, DPMB&B
	Dept. of Sustainable Organic Agriculture, TNAU, Coimbatore
51.	Dr. E. Somasundaram, Professor and Head
52.	Dr. K. Ganesan, Assistant Professor (Entomology)
53.	Dr. R. Sunitha, Assistant Professor (ENS)
	Dept. of Pulses, TNAU, Coimbatore
54.	Dr. L. Karthiba, Asst. Professor (Plant Pathology)
	Rice Research Station, Ambasamudram
55.	Dr. S. Arumugachamy, Professor(PBG) & Head
56.	Dr. S. R.Shri Rangasami Assistant Professor (Agronomy)
57.	Dr. R. Ramjegathesh, Assistant Professor (Pl.Pathology)
	Agricultural College & Research Institute, Madurai
58.	Dr. R.P. Gnanamalar, Professor (PBG)
59.	Dr. S. Banumathy Asso.Prof. (PBG)
60.	Dr. A. Yuvaraja, Asso.Prof. (PBG)
61.	Dr. P. Arunachalam, Asst.Prof. (PBG)

62.	Dr. P. Saravana Pandian, Professor (SS&AC)
63.	Dr. P. Kannan, Asst. Professor (SS&AC)
64.	Dr. K. Kumutha, Professor and Head (Agrl. Microbiology)
65.	Dr. M. Jeya Bharathi, Asst. Professor (Agrl. Microbiology)
66.	Dr. K. Premalatha, Asst. Professor (Agrl. Entomology)
67.	Dr. N. Revathi, Assoc. Professor (Plant Pathology)
68.	Dr. R. Akila, Asst. Professor (Plant Pathology)
	Agricultural College & Research Institute, Killikulam
69.	Dr. M. Arumugam Pillai, Professor & Head (PBG)
70.	Dr. S. Saravanan, Asst. Professor (PBG)
71.	Dr. Asish K Binodh, Assistant Professor (PBG)
72.	Dr. N. Aananthi, Assistant Professor (PBG)
73.	Dr. M. Hemalatha, Assoc. Professor (Agronomy)
74.	Dr. N. Senthil Kumar, Assistant Professor (Agronomy)
75.	Dr. Sabarinathan, Asst. Professor (Agrl. Microbiology)
76.	Dr. M. Gomathy, Asst. Professor (Agrl. Microbiology)
77.	Dr. K. Elanchezhan, Asst. Professor (Agrl. Entomology)
78.	Dr. G. Preetha, Asst. Professor (Agrl. Entomology)
79.	Dr. N. Rajinimala, Asst. Professor (Plant Pathology)
	Anbil Dharmalingam Agricultural College & Research Institute, Trichy
80.	Dr. T. Thirumurugan, Asst. Professor (PBG)
81.	Dr. P. Balasubramaniam, Professor & Head (SS&AC)
82.	Dr. A. Alagesan, Asst. Professor (Agron.)
83.	Thiru. S. Pandarinathan, Asst. Professor (Biochem)
84.	Dr. S. Sheeba Joyce Roseleen, Asst. Professor (Agrl. Entomology)
85.	Dr. R.P. Soundararajan, Asst. Professor (Agrl. Entomology)
86.	Dr. K. Rajappan, Professor (Plant Pathology)
87.	Dr. K. Chitra, Asst. Professor (Plant Pathology)
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88.	Dr. N. Shunmugavalli, Professor and Head
89.	Dr. M. Jayasekhar, Professor (Plant Pathology)
90.	Rice Research Station, Tirur
91.	Dr. A. Sheeba, Asst. Professor (PBG)
92.	Dr. C. Muralidharan, Professor (Agronomy)
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93.	Dr. B. Meenakumari, Assistant Professor (PBG)
94.	Dr. K. M. Sellamuthu, Assistant Professor (SS&AC)
95.	Dr. S.K. Natarajan, Assistant Professor (Agronomy)
96.	Dr. N. Satheeshkumar, Assistant Professor (Agronomy)
97.	Dr. R. Vigneshwari, Assistant Professor (SS&T)
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100.	Dr. S. Babu, Professor (SS& AC)
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102.	Dr. D. Kumaresan, Assoc. Professor & Head (PB&G)
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103.	Dr. P. Boominathan, Assoc. Prof. (CRP)
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104.	Dr. K. Geetha, Professor (PB&G)
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105.	Dr. S. Muthuramu, Asst. Professor (PB&G)
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106.	Dr. S. Juliet Hepziba, Professor & Head
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110.	Dr. T. Myrtle Grace, Professor & Head and Project Director
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113.	Dr. R. Nalini, Professor (Agrl. Entomology)
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114.	Dr. P. Ahila Devi, Asst. Professor (Plant Pathology)
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115.	Dr.K.Sathyamoorthi, Professor (Agron.)
116.	Dr.K.N.Ragumoorthi, Professor (Agrl.Entomology)