TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

37th Millets and Forage crops Scientists' Meet 2019

(9-10th May 2019)

Lead Center
Department of Millets,
CPBG, Coimbatore

Directorate of Research
Tamil Nadu Agricultural University
Coimbatore 641 003

2019

PROCEEDINGS

37th Millets and Forage crops scientist meet (May 9-10, 2019)

The 37th crop scientists meet on Millets and Forage crops was held during May 9-10, 2019 at Tamil Nadu Agricultural University, Coimbatore. Review of University Research Sub Projects on Crop improvement, Crop management and Crop protection was taken up on 09.05.2019 by the respective **Technical Directors**. Salient findings emanated from the results of the experiments conducted by the scientists were taken up for presentation and deliberation for the next day.

The action plan finalization meeting was held on 10.05.2019 under the Chairmanship of **Dr. N. Kumar**, the honorable Vice Chancellor of TNAU. The Director of Research, Technical Directors, Deans and Scientists from different research stations attended the plenary session. The highlights of Millets and Forage crops research in TNAU for the year 2018-19 was presented by **Dr. K.S. Subramanian**, Director of Research. **Dr. K.R. Ashok**, Director (CARDS) delivered about the overview of Millets and Forage crops cultivation in India as well as in Tamil Nadu.

The action taken report on the recommendations made during previous crop scientist meet and the details of cultures identified for release and ART/OFT/MLT and action plan to be taken up for the year 2019-20 on Millets and Forage crops in Crop Improvement was presented by **Dr. S. Geetha**, Director (CPBG). The salient findings, action taken report and action plan for Crop management and Crop protection was presented by **Dr. V. Geethalakshmi**, Director (Crop Management) and **Dr. K. Prabakar**, Director (CPPS) respectively. Finally, the meeting was concluded with the remarks of the Vice Chancellor and Director of Research.

The Proceedings of the meet is furnished as below

I. CROP IMPROVEMENT

A. Decisions made on the entries for Variety Release Proposal/ART/OFT/MLT evaluation
B. Research Projects on Millets and Forage Crops
C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-22

II. CROP MANAGEMENT

A. Decisions made on OFT
B. Research Projects on Millets and Forage Crops
C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-22

III. CROP PROTECTION

A. Decisions made on OFT
B. Research Projects on Millets and Forage Crops
C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-22

IV. CLOSING REMARKS & WAY FORWARD

V. PARTICIPANTS

I. CROP IMPROVEMENT

A. Entries for variety release proposal/ART/OFT/MLT (2019-2020)

Variety Release:

A1. Sorghum

No	Culture	Pedigree	Duration (days)	Seed yield (kg/ha)	Dry Fodder yield (kg/ha)	Yield increase over check CO 30 (%)	Special features
1	TNS 648	APK1 x M35-1	105-110	3051 (I) 2231 (RF)	10795 (I) 6700 (RF)	10.0	• High Protein content (12.59%) • Resistant to shoot fly (19.7%) & Stem borer (8.14%) • Resistant to grain mould (3%) & downy mildew (5.6%)

A2. Ragi

No	Culture	Pedigree	Duration (days)	Seed yield (kg/ha)	Yield increase over check CO 15 (%)	Special features
1	TNEc 1285	TNAU 900 x CO (Ra) 14	110	2256	12.5	• High yield • Large panicle • Bold seeds

A3. Tenai

No	Culture	Pedigree	Duration (days)	Seed yield (kg/ha)	Yield increase over check CO (Te) 7 (%)	Special features
1	TNSi 331	PS 4 x ISe 198	85-90	2889	22.80	• Drought tolerant • High tillering (>8)

ART:

A4. Sorghum

S.No.	Crop / Culture	Parentage	Duration (days)	Grain yield Kg/ha)	Special attributes
1.	TKSV 1036 (R)	ICSB 518 x SPV 1489	100	2102	Dual purpose, suitable for rainfed condition
2.	TNS 661 (R)	TNS 603 x IS 18551	100	3016	Pearly white grain, Moderately resistant to shoot fly
Observations to be recorded: Days to 50 % flowering, plant height, grain yield, straw yield and pests and disease score if any					

A5. Pearl millet

S.No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	TNBH 121235 (R)	ICMA 01666x PT6303	90	2676	Compact Earhead with bold grains and resistant to downy mildew
Observations to be recorded: Days to maturity, grain yield kg/ha, straw yield kg/ha and pests and disease score if any.					

A6. Maize (Irrigated)

S. No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1	CMH 11-586 (R)	N 09 164-2 x N148	105	7501	High yielding, Orange kernels, MR to charcoal rot (3.35)
2	VaMH 12014 (R)	UMI 1200x VIM 357	100	7204	High yielding, yellowish dent kernels, MR to TLB (2.9)
Observations to be recorded: 50 % tasseling, 50% silking and grain yield (kg/ha), shelling percentage and pests and disease score if any					

A7. Small Millets - Ragi

S.No	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	TNEc 1294	CO (Ra) 14 x TNAU 950	110	2256	High yield, large panicle, bold seeds
Checks: Paiyur 2, CO 15					

A8. Tenai

S. No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	TNSi337 (R)	CO6 x ISe198	85-90	1965	High tillering, blast tolerant, tip sterility absent
Checks: CO (Te) 7					

A9. Varagu

S. No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	TNPSc 176 (R)	Selection from DPS 19	120-125	1698	High yielding, suitable for rainfed conditions
Checks: CO3, TNAU 86					

A10. Panivaragu

S. No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	TNPm247	PV1403 x PV1673	69	1365	High yield, large panicle, bold seeds
2.	TNPm 238 (R)	Selection from IPM19	63	1935	Stable in yield potential, Drought tolerant and non lodging.
Checks: CO (PV) 5, ATL 1					

A11. Distribution of ART

Sorghum			
Season	***Kharif* (Jun-Jul)**	***Rabi* (Sep-Oct)**	***Summer* (Feb- March)**
Districts	20 districts, 52 locations Villupuram(2), Vellore (4) Tiruvallur(2), Thiruvannamalai (4), Cuddalore(2), Dharmapuri(2), Krishnagiri(2), Salem (2) Namakkal (2), Coimbatore(4) Tirupur (4), Erode (2), Trichy(2), Perambalur(2), Karur(2), Pudukkottai,(2) Madurai(2), Theni(2), Dindigul(2), Virudhunagar (4)	7 districts, 28 locations Madurai, Dindigul, Virudhunagar, Ramnad, Sivagangai , Thoothukudi and Thirunelveli	14 districts, 52 locations Dharmapuri, Krishnagiri, Salem Namakkal, Coimbatore Tirupur , Trichy, Perambalur, Karur, Pudukkottai, Madurai, Theni, Dindigul, Virudhunagar
KVK	8 KVKs, 16 trials, 2 trials/KVK Pudukottai, Perambalur, Cuddalore, Trichy, Vellore, Villupuram, Salem, Madurai	8 KVKs, 16 trials, 2 trials/KVK Pudukottai, Cuddalore, Virudunagar, Trichy, Vellore, Aruppukottai, Villupuram, Madurai	9 KVKs, 16 trials, 2 trials/KVK Pudukottai, Cuddalore, , Trichy, Vellore, Thiruvallur, Villupuram, Salem, Madurai, Dharmapuri,
Pearl Millet			
Season	***Kharif* (Jun-Jul)**	***Rabi* (Sep- Oct)**	***Summer* (Feb - March)**
Districts	13 districts, 38 trials Tiruvallur, Villupuram, Thiruvannamalai, Cuddalore, Dharmapuri, Salem, Namakkal (4), Erode(4), Trichy, Perambalur(4), Karur (4) Theni, Dindigul (4)	6 districts, 18 trials (3 trials/districts Madurai, Virudhunagar, Ramnad, Sivagangai , Thoothukudi and Thirunelveli	17 districts, 34 trials (2/districts) Tiruvallur, Villupuram, Vellore, Thiruvannamalai, Cuddalore, Dharmapuri, Salem, Namakkal, Erode, Coimbatore,

			Trichy, Perambalur, Karur , Pudukottai, Madurai Theni, Dindigul
KVK	10 districts, 20 trials (2/KVK) Pudukottai, Perambalur, Cuddalore, Virudunagar, Trichy, Vellore, Aruppukottai, Villupuram, Salem, Madurai	7 districts, 14 trials (2/KVK) Pudukottai, Cuddalore, Trichy, Vellore, Aruppukottai, Villupuram, Madurai	9 districts, 18 trials (2 trials/KVK) Pudukottai, Cuddalore, Trichy, Vellore, Thiruvallur, Villupuram, Salem, Madurai, Dharmapuri,
Maize			
Season	*Kharif* (Jun-Jul)	*Rabi* (Dec-Jan) Irrigated	
Districts	Villupuram, Cuddalore, Dharmapuri, Salem, Krishnagiri, Namakkal, Coimbatore, Erode, Perambalur, Karur, Pudukkottai, Madurai, Theni (*kharif* and *rabi*: each district 4 locations)		
KVKs	Pudukottai, Karur, Perambalur, Cuddalore, Trichy, Vellore, Thiruvallur, Villupuram, Salem, Madurai, Dharmapuri, Theni (kharif -16 trials, Rabi-18 trials, each 2 trials in respective KVKs)		
Small millets			
Ragi			
Season	***Kharif* 2019-20 (Rainfed)**		
	Villupuram, Vellore, Kanchipuram, Thiruvanamalai, Dharmapuri, Salem, Krishnagiri, Namakkal, Erode, Ramnad (Each district 5 locations), Rainfed (10 districts, 50 locations)		
Tenai			
Season	***Kharif* 2019-20 (Rainfed)**		
Districts	Villupuram, Vellore, Cuddalore, Dharmapuri, Salem, Namakkal, Madurai, Virudhunagar, Thoothukudi, Thirunelveli (Each district 5 locations) (10 districts, 50 locations)		
Varagu			
Season	***Kharif* 2019-20 (Rainfed)**		

Districts	Villupuram, Vellore, Cuddalore, Dharmapuri, Salem, Ariyalur, Perambalur, Pudukottai, Madurai, Virudhunagar (Each district 5 locations) (10 districts, 50 locations)
Panivaragu	
Season	***Kharif* 2019-20 (Rainfed)**
Districts	Villupuram, Vellore, Thiruvanamalai, Salem, Namakkal, Madurai, Theni, Virudhunagar, Thoothukudi, Tirunelveli (Each district 5 locations)(10 districts, 50 locations)

A12. Pearl Millet: OFT

S.No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	TNBH 08804	ICMA 99555 x PT 6067	90	3864: (I) 3304: (R)	Compact Earhead with bold grains and resistant to downy mildew
Checks; CO 9 hybrid and private hybrid **Observations to be recorded:** Days to 50 % flowering, Days to maturity, seed set per cent, grain yield kg/ha, straw yield kg/ha and pests and disease score if any.					

Pearl Millet OFT Seasons		
Kharif	June-July	Villupuram, Vellore, Tiruvannamalai, Cuddalore, Dharmapuri, Salem, Namakkal, Erode, Coimbatore, Tiruchirapalli, Perambalur, Karur, Pudukkottai, Madurai
Rabi	Sept-Oct	Theni, Dindigul, Virudhunagar, Sivagangai, Thoothukudi and Tirunelveli

A13. Maize (Irrigated): OFT

S. No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	CMH 12-686	UMI N09153-1-2 x N148	100	10269	High yielding, Orange kernels MR to charcoal rot (3.6)

2.	CMH 15-005	UMI 1220 x UMI 1210	105	9657	High yielding suited for rainfed and irrigated situations
	Checks: CO 6, NK 6240 **Observations to be recorded:** 50 % tasseling, 50% silking, grain yield (kg/ha), shelling percentage				

Maize OFT Irrigated Seasons		
Kharif	June – July	Coimbatore, Tiruppur, Salem, Namakkal, Erode, Perambalur, Madurai, Theni, Dharmapuri, Krishnagiri, Karur, Cuddalore, Villupuram

A14. Maize (Rainfed): OFT

S.No.	Crop / Culture	Parentage	Duration (days)	Grain yield (Kg/ha)	Special attributes
1.	CMH 15-005	UMI 1220 x UMI 1210	105	5276	High yielding, drought tolerant suited for rainfed situations
2.	VaMH 12013	UMI 1200 x VIM 419	100	5009	Suitable for rainfed condition, Orange yellow dent kernels, Moderately resistant to TLB (3.0)
	Checks: CO 6, NK 6240 **Observations to be recorded:** 50 % tasseling, 50% silking, grain yield (kg/ha), shelling percentage				

Maize OFT Rainfed Seasons		
Rabi - Rainfed (25)	September – October	Dindigul, Madurai, Thoothukudi, Virudhunagar, Thirunelvelli (5)

A15. Sweet corn: OFT

S. No.	Crop / Culture	Parentage	Duration (days)	Grain yield (kg/ha)	Special attributes
1.	CSCH 15001	USC-1-2-3-1 x 12039-1	70-73	16363	High yield and big kernel size
2.	CSCH 15005	USC-1-2-3-1 x SC1107	71-73	15807	Long cobs and plumpy sweet kernels
	Check: Misthi				

Observations to be recorded: 50 % tasselling & silking and Green cob yield (kg/ha)

Sweet corn OFT Seasons		
kharif	July – August	Dharmapuri, Krishnagiri, Namakkal , Theni, Salem and Tiruppur

MLT:

A16. Grain Sorghum

Design : RBD	No. of replications : Four
Plot size : 4 × 2.7 m^2	Seed Quantity : 100 g/entry/location
Spacing : 45 × 15 cm	Season: kharif, rabi, Summer

Salient Features of the proposed cultures

Culture	**Parentage**	**Duration (days)**	**Yield (kg/ha)**	**Special traits**
TNS 667 (R)	TNS 630 x TNS 634	105-110	2537	Dual purpose, moderately resistant to shoot fly and stem borer
TNS 670	TNS 633 x TNS 636	105-110	2429	Dual purpose; Resistant to midge, shoot fly & Stem borer
TKSV 1311	TKSV 0802 x TKSV 0822	95-100	3121	Pearly white grain Bold grain (2.7g) Resistance to midge Photo insensitive
TKSV 1158	TKSV 818 x CSV 17	95-100	3165	Creamy white grain Early duration Resistance to midge Photo insensitive

Checks: CO 30, K12		
Kharif (4)	(June – July)	Coimbatore, Paiyur, Bhavanisagar, Athiyanthal
Rabi (5)	(Sept-Oct)	Kovilpatti, Yethapur, Aruppukkottai, Paiyur, Vaigaidam
Summer (3)	(Jan – Feb)	Coimbatore, Bhavanisagar and Vaigaidam
Fertilizer dose	95:45:45 NPK kg/ha	

Observations to be recorded: Days to 50 % flowering, Days to maturity, grain yield kg/ha, straw yield kg/ha and pests and disease score if any

A17. Forage sorghum: MLT

Design : RBD	No. of replications : Four
Plot size : 4 × 2.4 m^2	Seed Quantity : 100 g/entry/location
Spacing : 30 × 15 cm	Season: kharif, rabi, Summer

Features of the proposed cultures

S. No.	Crop / Culture	Parentage	DFF (days)	GFY (t/ha)	Special attributes
1.	TNFS 220	BMR 211 X CSV 24SS	60	31.97	Plant Height -270 cm; Brix-12 %; TSS-9.74%
2.	TNFS 222	TNS 623 X ICSV 700	57	34.75	Plant Height -210 cm; Brix-10 %; TSS-7.54%

Seasons		
Kharif (4)	(June – July)	Coimbatore, Paiyur, Bhavanisagar, Athiyanthal
Rabi (4)	(Sept-Oct)	Kovilpatti, Yethapur, Aruppukkottai, Paiyur
Summer (3)	(Jan – Feb)	Coimbatore, Bhavanisagar and Vaigaidam
Fertilizer dose	95:45:45 NPK kg/ha	

Observations to be recorded: Days to 50 % flowering, plant height (cm), green fodder yield (t/ha), leaf length (cm) and leaf breadth (cm), No of leaves/plant.

A18. Pearl Millet: MLT

Design : RBD	No. of replications : 3
Plot size : 4 × 2.7 m^2	Seed Quantity : 100 g/entry/location
Spacing : 45 × 15 cm	Season: kharif, rabi, Summer

Features of the proposed cultures

Culture	Parentage	Yield (kg/ha)	% increase over the check CO 9	Special traits
TNBH 1447	ICMA 99555 A x PT6067/39-4	3589	11.88	Compact earhead; Bold and grey grain Resistant to downy mildew and rust
TNBH 1619	ICMA 10444 A x PT 6679	3564	11.10	High grain yield, Bold, Compact and DM resistance
Seasons				
Kharif (8)	(June – July)	Coimbatore, Paiyur, Yethapur, Bhavanisagar, Vaigaidam, Vriddhachalam, Tindivanam and Athiyanthal		
Rabi (4)	(Sept-Oct)	Kovilpatti, Aruppukkottai, Paiyur and Tindivanam		
Summer (6)	(Jan – Feb)	Coimbatore, Pattukkottai, Paiyur, Bhavanisagar, Vriddhachalam and Vaigaidam,		
Fertilizer schedule: 80: 40:40 NPK Kg/ha				

Observations to be recorded: Days to 50 % flowering, Days to maturity, seed set per cent, grain yield kg/ha, straw yield kg/ha and Pests and disease score if any

A19. Maize (Irrigated): MLT

Design : RBD	No. of replications : 3
Plot size : 5 × 2.6 m^2	Seed Quantity : 100 g/entry/location
Spacing : 60 × 25 cm	Season: *kharif, rabi (irrigated)*

Features of the proposed cultures

Hybrids	Yield (kg/ha)	% inc. over check	Special traits
CMH 14-716	9567	10.2	Yellow and semi dent grains
ACM- M15-009	10730	11.3	High beta carotene (9. 60 µg/g)
Checks : TNAU Maize Hybrid CO 6, 900 M (G), NK 6240			

Seasons		
Maize MLT I	*Kharif* Irrigated (June – July) (7)	Coimbatore, Vagarai, Bhavanisagar, Paiyur, Athiyanthal, Vaigaidam, Virinjipuram
Maize MLT III	*Rabi* irrigated (Dec – Jan) (6)	Coimbatore, Vagarai, Bhavanisagar, Paiyur, Vaigaidam, Virinjipuram
Fertilizer schedule: 250: 75:75 NPK Kg/ha		

A20. Maize (Rainfed): MLT

Design : RBD	No. of replications : 4
Plot size : 5 × 2.6 m^2	Seed Quantity : 100 g/entry/location
Spacing : 60 × 25 cm	Season: Rabi (Rainfed)

Features of the proposed cultures

Hybrids	**Yield (kg/ha)**	**% increase over check**	**Special traits**
VaMH 15028 (R)	6927	10.2	Orange yellow semi dent grains
VaMH 15036 (R)	7195	14.4	Yellow and semi dent
Checks: TNAU Maize Hybrid CO 6, 900 M (G), NK 6240			
Maize MLT II	Rainfed (Sept-Oct) (5)		Aruppukkottai, Kovilpatti, Yethapur, Veppanthattai, Vagarai
Fertilizer schedule: 250: 75:75 NPK Kg/ha			

Observations to be recorded: Days to 50 % tasseling, Days to 50 % silking, Plant height (cm), Grain yield (kg/ha), pests and disease score if any

A21. Small millets – Ragi: MLT

Design : RBD	No. of replications : 4
No. of rows : 6 rows	Seed Quantity : 100 g/entry/location
Spacing : 22.5 × 10 cm	Season: Kharifi (Rainfed)

Features of the proposed cultures

Culture	Parentage	Yield (kg/ha)	% increase over CO (Ra) 14	Special traits
TNEc1299 (R)	CO15 x KMR346	2000	9.28	High yield, large panicle, bold seeds
TNEc1311	CO13 x KMR 346	2632	20.3	Long duration, dark brown seeds
Checks: Paiyur 2, CO 15				
Fertilizer schedule: 40: 20:00 Kg of NPK /ha				
Centers: Coimbatore, Paiyur, Bhavanisagar, Vaigaidam, Aruppukottai, Kovilpatti, Athiyandal, Chettinad				

A22. Kudiraivali: MLT

Design : RBD	No. of replications : 4
No. of rows : 6 rows	Seed Quantity : 100 g/entry/location
Spacing : 22.5 × 10 cm	Season:Kharifi (Rainfed)

Features of the proposed cultures

Culture	Parentage	Grain Yield (kg/ha)	Special traits
TNEf 197 (R)	CO (Kv) 2 x TNAU 153	1727	Large ear head, bold seeds
TNEf 301 (R)	CO (Kv) 2 x TNAU 185	2050	Large and compact ear head, bold seeds
Checks: CO (Kv) 2, MDU 1			
Fertilizer schedule: 40: 20:00 Kg of NPK /ha			
Centers : Coimbatore, Paiyur, Bhavanisagar, Vaigaidam, Aruppukottai, Kovilpatti, Athiyandal, Chettinad, Madurai			

A23. Samai: MLT

Design : RBD	No. of replications : 4
No. of rows : 6 rows	Seed Quantity : 100 g/entry/location
Spacing : 22.5 × 10 cm	Season:Kharifi (Rainfed)

Features of the proposed cultures

Culture	Parentage	Yield (kg/ha)	%increase over CO4	Special traits
TNPsu 203 (R)	CO (samai) 4 x TNAU170	2521	35.54	Large panicle, uniform maturity, resistant to shoot fly
TNPsu 207 (R)	CO2 x BL 41/3	2174	16.88	More basal tillers, thick culm, nonlodging, bold seeds
Check: CO (Samai) 4, ATL 1				
Fertilizer schedule: 40: 20:00 Kg of NPK /ha				
Centres: Coimbatore, Paiyur, Bhavanisagar, Vaigaidam, Aruppukottai, Kovilpatti, Athiyandal, Chettinadu				

A24. Tenai: MLT

Design : RBD	No. of replications : 4
No. of rows : 6 rows	Seed Quantity : 100 g/entry/location
Spacing : 22.5 × 10 cm	Season:Kharifi (Rainfed)

Features of the proposed cultures

Culture	Parentage	Yield (kg/ha)	% increase over CO(Te)7	Special traits
TNSi 354 (R)	CO5 x TNSi278	2391	15.0	Large panicle; No tips sterility Rust tolerant
TNSi 356 (R)	CO6 x TNSi267	2389	15.0	Profuse tillering; Drought tolerant; Compact panicle
Checks: CO (Te) 7				

Fertilizer schedule: 40: 20:00 Kg of NPK /ha
Centres: Coimbatore, Paiyur, Bhavanisagar, Vaigaidam, Aruppukottai, Kovilpatti, Athiyandal, Chettinadu

A25. Varagu: MLT

Design : RBD	No. of replications : 4
No. of rows : 6 rows	Seed Quantity : 100 g/entry/location
Spacing : 22.5 × 10 cm	Season:Kharifi (Rainfed)

Features of the proposed cultures

Culture	Parentage	Yield (kg/ha)	% increase over CO 3	Special traits
TNPsc 301 (R)	Selection from RK 156	1920	14.97	Profuse tillering and high yielding
TNPsc 313	Pureline selection from TNAU 111	3814	32.1	Nonlodging, bold seeds and high yielding
Checks: CO 3, TNAU 856				
Fertilizer schedule: 40: 20:00 Kg of NPK /ha				
Centres: Coimbatore, Paiyur, Bhavanisagarm, Vaigaidam, Aruppukottai, Kovilpatti, Athiyandal, Chettinadu				

A26. Panivaragu: MLT

Design : RBD	No. of replications : 4
No. of rows : 6 rows	Seed Quantity : 100 g/entry/location
Spacing : 22.5 × 10 cm	Season:Kharifi (Rainfed)

Features of the proposed cultures

Culture	Parentage	Yield (kg/ha)	% increase over CO(PV)5	Special traits

TNPm252 (R)	TNAU151 x IPL2710	2291	25.0	Large panicle, golden yellow grains, shoot fly resistant, drought tolerant
TNPm255 (R)	TNAU164 x IPL2718	2177	19.0	Large panicle, compact panicle, drought tolerant, upright flag leaf
Checks: CO (Pv) 5, ATL 1				
Fertilizer schedule: 40: 20:00 Kg of NPK /ha				
Centres: Coimbatore, Paiyur, Bhavanisagar, Vaigaidam, Aruppukottai, Kovilpatti, Athiyandal, Chettinadu				

Observations to be recorded: Days to 50 % flowering, Days to maturity, grain yield kg/ha, straw yield kg/ha and pests and disease score if any

FORAGE CROPS

A27. Forage crops - Cumbu Napier hybrid grass: MLT

Design : RBD	No. of replications : 2
Plot size : 4 × 3 m^2	Seed Quantity : 100 g/entry/location
Spacing : 60 × 50 cm	Season: *Kharif*

Features of the proposed cultures

Entry	Parentage	Duration	GFY (t/ha/yr)	Special features
TNCN 1534	IP 20379 x FD 434	Perennial	390.60	High biomass More leaf stem ratio
TNCN 1536	IP18308 X FD 470	Perennial	383.00	
Check: CO (BN) 5				
***Kharif* 2019 (June – July):**	Coimbatore, Aliarnagar, Mettupalayam, Vridhachalam, Tirur, Bhavanisagar, Killikulam, Ambasamudram, Vamban, Yethapur			
Fertilizer:	150:50:40 kg/ha			

Observations to be recorded: Plant height (cm), Number of tillers/clump and Green fodder yield per plot

A28. Fodder maize: OFT

Plot size : 4 × 1.8 m^2	Seed Quantity : 100 g/entry/location
Spacing : 30 × 15 cm	Season:Kharifi (Rainfed)

Features of the proposed cultures

Entry	Parentage	Duration (Days)	Green fodder yield (t/ha)	Special features
TNFM 131-9	Composite of five inbreds	65	45.0	Ten days earlier than African Tall; White grain; More palatable
Check: African Tall				
Season: *Kharif* 2019/ *Rabi* 2019-20				
Fertilizer:	30:40:20 kg/ha			

Observations to be recorded: Days to 50 % flowering and Green fodder yield per plot

Important Dates in conduct of MLT and ART

Activities	Season	Tentative date/month
Dispatch of seed materials from the lead centre	*Kharif*	2nd week of June
	Rabi	2nd week of August
	Summer	1st week of January
Visit of MLT/monitoring teams	*Kharif*	1st fortnight of September
	Rabi	1st fortnight of December
	Summer	1st fortnight of April
Date for receiving the trials results for compilation	*Kharif*	2nd week of November
	Rabi	1st week of February
	Summer	3rd week of June

Monitoring team to visit Millets MLT 2019-20

Team	Stations to be visited
Dr. N. Kumari Vinodhana Dr. D. Kavithamani Dr. A. Sudha	Bhavanisagar, Vagarai
Dr. R. Ravikesavan Dr. C. Vanniarajan	Kovilpatti, Aruppukkottai, Vaigaidam
Dr. K. R. V. Sathya sheela Dr. N. Malini Dr. Radhajayalakshmi	Coimbatore, Madurai
Dr. A. Nirmalakumari Dr. P. Suthamathi Dr. Rajesh	Paiyur, Virinjipuram
Dr. A. Yuvaraj Dr. K. Iyanar Dr. T. Srininvasan	Athiyanthal, Vridhachalam
Dr. C. Babu Dr. T. Ezhilarasi Dr. S. D. Sivakumar	Aliarnagar, Mettupalayam, Vridhachalam, Tirur, Bavanisagar, Killikulam, Ambasamudram, Vamban, Yethapur

B. Research projects on Millets and Forage crops

A total number of 42 projects including URPs, AICRP and Externally funded projects of Millets and Forage crops and CPMB handled by 26 scientists were reviewed by the respective Directors of CPBG and CPMB. The abstract of the projects reviewed is furnished below:

Crops	Crops and centres	URP	AICRP	EFP	Total	No. of Scientists
Sorghum	Coimbatore	3	1	-	4	2
	Kovilpatti	2	-	-	2	1
	Virinjipuram	1	-	-	1	1
	Aruppukottai	1			1	1

	Paiyur	1	-	-	1	1
	Trichy	1	-	-	1	1
	Madurai	1	-		1	1
	Sub total	**10**	**1**	**-**	**11**	**8**
Pearl millet	Coimbatore	2	1	-	3	1
	Sub total	**2**	**1**	**-**	**4**	**1**
Maize	Coimbatore	3	1	-	4	2
	Vagarai	1	1	-	2	1
	Veppanthattai	1	-	-	1	1
	Sub total	**5**	**2**	**-**	**7**	**4**
Small millets	Athiyandal	3	1	-	4	1
	Paiyur	1	-	-	1	1
	Madurai	1	-	-	1	1
	Chettinad	2	-	-	1	1
	Trichy	2	-	-	2	2
	Sub total	**9**	**1**	**-**	**10**	**6**
Total Projects (Millets)		**26**	**5**	**-**	**32**	**19**
Forage crops	Coimbatore	2	1	1	4	2
	Killikulam	1	-	-	1	1
	Mettupalayam	-	-	-	-	1
CPMB		2	-	4	6	3
Grand total		**31**	**6**	**5**	**42**	**26**

URP: University Research Project, AICRP: ICAR funded AICRP projects, EFP: Externally funded projects

C. Remarks of the Ongoing URPs / AICRPs / Externally Funded Projects in Crop Improvement

No	Project No. and Title	Project leaders	Duration	Remarks
	C1. University Research Projects (URPs)			
Sorghum				
1.	CPBG/CBE/PBG/SOR/2018/001 Collection and characterization of sorghum germplasm	Dr. D. Kavithamani Assistant Professor (PBG)	April 2018 to March 2023	Drought tolerant lines may be evaluated and characterized for one more season and confirmed for

				their tolerance level. Bold grain types may be used in the crossing programme
2.	CPBG/CBE/PBG/SOR/2018/002 Development of dual purpose varieties of sorghum resistant to major pests (Shoot fly/Stem borer/ Midge)	Dr. B. Selvi Professor (PBG)	June 2018 to May 2023	The genetic base may be widened. Midge and shoot fly resistant lines may be provided to the CPMB for confirmation through markers
3.	CPBG/CBE/PBG/SOR/2016/001 Development of fodder sorghum varieties with improved quality traits	Dr. D.Kavithamani Assistant Professor (PBG)	April 2016 to March 2019	Germplasm lines identified for fodder purpose may be used in the crossing programme. The culture TNFS 222 to be taken up on fast track mode.
4.	CPBG/KPT/PBG/SOR/2015/001 Evolution of high yielding, suitable sorghum varieties with resistance to earhead midge for late / normal sowing conditions.	Dr. N. Malini Assistant Professor (PBG)	March 2015 to February 2020	The seeds of local collection (red sorghum) may be spared to Madurai centre keeping a separate set exclusively for rainfed evaluation. The sorghum landraces collected from different centres may be assembled and evaluated at Kovilpatti under rainfed condition
5.	CPBG/KPT/PBG/SOR/2017/001 Nucleus and Breeder seed production of sorghum varieties of Tamil Nadu.	Dr. N. Malini Assistant Professor (PBG)	Dec. 2016 to Nov. 2019	The indented quantity of seeds may be produced and supplied to the indenters as per the programme
6.	CPBG/APK/PBG/SOR/2018/001 Evolution of dual purpose sorghum varieties suitable for rainfed regions of south Tamil Nadu	Dr. M. Gunasekaran Professor (PBG)	Sept. 2018 to Aug. 2023	In the evaluation of segregating population a check may be added for comparision. Field

				visit may be made to Coimbatore at bloooming stage for selection of suitable plant type for rainfed situations from segegating population.
7.	CPBG/TRY/PBG/SMM/2017/001 Evolution of high yielding dual purpose Sorghum (*Sorghum bicolor*) varieties suited to sodic soils	Dr. A. Subramanian Associate Professor (PBG)	Sept. 2017 to Aug. 2020	The seeds of all the lines collected and evaluated may be spared to Paiyur and Madurai and to PGR for storage.
8.	CPBG/PAI/PBG/SOR/2016/001 Collection, characterization, evaluation and conservation of red sorghum (*Sorghum bicolour*) germplasm lines	Dr. K. Geetha Professor (PBG)	Aug. 2016 to Dec. 2020	The name of the local collections should not be changed and its should be maintained in the same name unless selection is effected. Seeds of the lines may be spared to Aruppukkottai and Madurai. The sorghum landraces collected from different centres may be assembled and evaluated at Paiyur under irrigated condition. During evaluation and characterization the breeders from other centres should also be invited.
9.	CPBG/VIJ/PBG/SOR/2016/001 Evaluation of local thalaivirichan sorghum genotypes for higher yield	Dr. A. Gopikrishnan Assistant Professor (PBG)	Nov 2106 to Oct 2019	The project is recommended for closure and the best lines selected may be sent to Coimbatore and also to PGR for storage along with passport data.

10.	CPBG/MDU/PBG/SOR/2019/001 Evolution of high yielding red sorghum (*Sorghum bicolor*) varieties suitable for industrial utilities	Dr. A. Yuvaraja Associate Professor (PBG)	Feb 2019 to Jan 2024	Only Recombination breeding should be used to develop good targeted plant types and pure line selection from land races is not encouraged.
Cumbu				
11.	CPBG/CBE/PBG/PEM/2015/004 Evolution of high yielding single cross pearl millet hybrids with resistance to downy mildew	Dr. K. Iyanar Associate Professor (PBG)	April 2015 - March 2020	Restoration capacity of the newly derived 'A' lines with the restorers may be attempted.
12.	CPBG/CBE/PBG/PEM/2015/005 Maintenance of genetic purity and production of nucleus seeds of parental lines of hybrids and composites developed in pearl millet (*Pennisetum glaucum* L.)	Dr. K. Iyanar Associate Professor (PBG)	July 2015 –June 2020	The indented quantity of seeds may be produced and supplied to the indenters as per the programme
Maize				
13.	CPBG/CBE/PBG/MAZ/2018/001 Development of high yielding sweet corn hybrids suitable for Tamil Nadu	Dr.R.Ravikesavan Professor (PBG)	June 2018- May 2023	The quality of the stalk of the sweet corn hybrids may also be evaluated
14	CPBG/CBE/PBG/MAZ/2018/002 Development of high yielding single cross maize hybrids in late (> 95 d) and medium (> 85-95 d) maturity suitable for irrigated ecosystems.	Dr. N. Kumari Vinodhana Assistant Professor (PBG)	June 2018 to May 2023	Breeding for hybrids with more number of kernel rows (> 14) and more no. of kernels (>38) may be attempted. A mid term correction to be sent to DR office to include both the breeders name in the project Also the African tall or other maize fodder types may be included in the FAW screening
15.	CPBG/CBE/PBG/MAZ/2018/003 Germplasm maintenance and	Dr. N. Kumari Vinodhana,	June 2018	The indented quantity of breeder

	Breeder seed production in Maize	Assitant Professor (PBG)	to May 2023	seeds may be produced and supplied to the indenters as per the programme. Characterization of germplasm lines may be continued. The lines identified for their better diameter should be studied critically in the next season also and reported
16.	CPBG/VGI/PBG/MAZ/2015/001 Development of high yielding single cross maize hybrids suitable for rainfed ecosystems	Dr. K. R. V. Sathya Sheela Assitant Professor (PBG)	April 2015 to March 2020	The hybrid VaMH 12013 may be taken to OFT after assessing the seed availability
17.	CPBG/VPT/PBG/MAZ/2016/001 Development of high yielding Single cross Maize Hybrids for Rainfed system in Tamil Nadu	Dr. S. Sivakumar Professor (PBG)	June 2016 to May 2019	The project may be closed and the work may be done as action plan.
Small Millets				
18.	CPBG/ATL/PBG/SMM/2014/001 Genetic improvement of drought resistance in *Samai, Tenai* and *Panivaragu* to evolve high yielding varieties suitable for Tamil Nadu	Dr. A.Nirmala Kumari Professor (PBG)	July 2014 to June 2019	The closure report of the project may be submitted
19.	CPBG/ATL/PBG/SMM/2016/002 Genetic improvement of Finger millet, Kodo millet and Barnyard millet to evolve high yielding varieties suitable for rain fed conditions of Tamil Nadu	Dr. A. Nirmala Kumari Professor (PBG)	Aug. 2015 to July 2018	The closure report of the project may be submitted
20.	CPBG/ATL/PBG/BSP/2015/003 Nucleus and breeder seed production in Ragi, Samai, Varagu, Kudiraivali, Tenai and Panivaragu	Dr. A. Nirmala Kumari Professor (PBG)	Oct. 2015 to Sep. 2020	The indented quantity of seeds may be produced and supplied to the indenters as per the programme.
21.	CPBG/MDU/PBG/SMM/2019/001 Evolution of high yielding, high nutritive value and problem soil	Dr. C. Vanniarajan Professor (PBG)	June 2019 to May 2024	While laying out the trial the spacing may

	tolerant barnyard millet variety better than MDU 1			be reduced and it should be as per the CPG. The germplasm lines should only be evaluated only in TNAU stations and it should not be laid out outside the campus in the farmer holdings
22.	CPBG/TRY/PBG/SMM/2017/001 Evolution of high yielding Kudhiraivali varieties (Barnyard millet) suited to sodic soils	Dr. A. Subramanian Associate Professor (PBG)	May 2017 to April 2020	Closure proposal may be submitted and the materials generated may be transferred to Athiyanthal and Madurai
23.	CPBG/TRY/PBG/SMM/2017/002 Evaluation of sodicity tolerance in finger millet (*Eleusinecoracana* (L.) *Gaertn*) genotypes	Dr. S. Chitra Assitant Professor (PBG)	June 2017 to April 2020	The pipeline cultures of ragi may be evaluated for sodicity tolerance
24.	CPBG/PAI/PBG/SMM/2017/ 001 Development of high yielding long duration ragi varieties suitable for rainfed areas of North Western Zone	Dr. P.Suthamathi Associate Professor (PBG)	April 2017 to March 2022	Focus on evolving for long duration Ragi varieties with blast resistance suitable for Dharmapuri and Krishnagiri districts
25.	CPBG/CTN/SMM/2018/CP172 Evolution of barnyard millet genotypes suitable under rainfed alfisols through mutation breeding'	Dr.R. Chandirakala Associate Professor (PBG)	2018-19	The materials generated may be transferred to Madurai centre
26.	CPBG/CTN/PBG/SMM/2010/001 Barnyard millet Advanced varietal trial (BAVT)	Dr.R. Chandirakala Associate Professor (PBG)	March 2018 to Till date	Voluntary trial need not be taken up at this centre
CPMB&B				
27.	CPMB/CBE/PBT/SMM/2015/001	Dr. S.	2016 to	Expression profiling

	Characterization and expression profiling of genes involved in Zn and Fe homeostasis in barnyard millet	Varanavasiappan Assistant Professor (Plt. Biotech.)	2019	may also be carried out in lines with low and medium iron content
28.	CPMB/CBE/PBT/2018/CP004 DNA fingerprinting and barcoding of varieties and hybrids and pre- release cultures for varieties/hybrids identification and notification	Dr. N. Kumaravadivel Professor (Plt. Biotech.)	2018 to 2019	DNA finger printing of all the cultures/ parents of the hybrids/composites in millet/forage crops in the advanced testing may be done. In addition, finger printing of all the 72 land races collected in red sorghum at various centres may also be taken up.

CPMB & B Externally Funded Project details				
29.	DBT/CPMB/CBE/PMB/2015/R006 Development of shoot fly resistant sorghum varieties suitable for Tamil Nadu through marker assisted selection	Dr. N. Kumaravadivel Professor (Plt. Biotech.)	June 2015 to June 2020	A few selected backcross lines with shootfly resistant QTLs may be spared to Coimbatore and kovilpatti for evaluation.
30.	UGC/CPMB/CBE/PMB/2015/R007 Mapping of shoot fly resistance QTLs in sorghum	Dr. N. Kumaravadivel Professor (Plt. Biotech.)	July 2015 to June 2018	A few selected lines from the mapping population of K8 x IS 2205 may be spared to Coimbatore and Kovilpatti centres for evaluation.
31.	E28-ZI - Enrichment of nutritional quality in maize through molecular breeding	Dr. N. Senthil Professor (Plt. Biotech.)	Apr. 2015 to Mar. 2020	Any distinguished traits in the converted lines of the inbreds UMI 1200 and UMI 1230

				from the normal may be identified. The converted lines may be utilized in the breeding programme
32.	DST/CPMB/CBE/DPB/2016/R022 Transcriptome of barnyard millet to characterize the Fe/Zn uptake metal transporters and transcriptional regulators involved in Fe and Zn homeostasis	Dr. S. Varanavasiappan Assistant Professor (Plt. Biotech.)	2016-2019	The closure report of the project may be submitted.
C2. Millets AICRPs				
Sorghum				
1.	AICRIP/PBG/CBE/SOR/006 All India Co-ordinated Research Project on Sorghum	Dr. B. Selvi, Professor (PBG) Dr. D. Kavithamani Assistant Professor (PBG)	April 2017 to March 2020	The Project may be Continued.
Pearl Millet				
2.	AICRP /PBG/CBE/PEM/009 All India Coordinated Research Project on pearl millet	Dr. K. Iyanar Associate Professor (PBG)	April 2017 to March 2020	The Project may be Continued.
Maize				
3.	AICRP /PBG/CBE/ MAZ/004 Evaluation of hybrids and composites from All India Coordinated Research Project on Maize	Dr. R. Ravikesavan Professor (PBG) Dr. N. Kumari Vinodhana Assistant Professor (PBG)	June 2017 to May 2020	The Project may be Continued.
4.	AICRP/PBG/VGI/MAZ/005 All India Coordinated Research Project on Maize	Dr. K. R. V. Sathya Sheela Asst professor (PBG) MRS, Vagarai	June 2017 to May 2020	The Project may be Continued.

Small Millets				
5.	AICRP / PBG / ATL / SMM / 008 All India Coordinated Research Project on Small Millets	Dr. A. Nirmala kumari Professor (PBG)	Continuous Project	The Project may be Continued.
C3. Forage Crops - URP				
1.	CPBG/CBE/PBG/FRG/2015/004 Evolution of leguminous forage crops (Lucerne and Fodder cowpea) for high yield and protein content	Dr. C. Babu Professor (PBG)	April 2015 to March 2020	Promising fodder cowpea cultures identified may be studied for quality aspects The project may be continued
2.	CPBG/CBE/PBG/FRG/2015/005 Evolution of forage grasses (Cumbu Napier hybrid and Guinea grass) for high biomass and quality	Dr. T. Ezhilarasi Assistant Professor (PBG)	April 2015 to March 2020	Cuttings of CN hybrid KKM 1 may be obtained from AC &RI, Killikulam and planted. The project may be continued
3.	CPBG/KKM/PBG/2017/001 Development of Cumbu Napier hybrids with superior quality traits for Tamil Nadu	Dr. N. Ananthi Assistant Professor (PBG)	April 2017 to March 2020	The P&H (Forage), Coimbatore may share the crossed seeds of BN to Killikulam centre for further evaluation at Killikulam The project may be continued
C4. Forage crops AICRP				
1.	AICRP/PBG/CBE/FCR/026 All India Coordinated Research Project on Forage Crops	Dr. C. Babu Professor (PBG)	April 2015 to March 2020	The Project may be Continued.
C5. Forage Crops - Externally Funded Project				
1.	DBT/CPBG/CBE/FC/2019/R004 Establishment of biotech KISAN hub at Tamil Nadu Agricultural	Dr. C. Babu Dr. R. Sudhagar Dr. S. D.	April 2018 to	The objectives of the project have to be fulfilled without any

	University, Coimbatore	Sivakumar	March 2020	deviation

D. General remarks

During the review of crop improvement projects by the Director, CPBG insisted upon for a uniform numbering of the cultures of all crops. The naming should be ID of the centre followed by the year and the culture/ hybrid number.

E. Action Plan 2019 – 2022

<table>
<tr><th colspan="2">Theme 1:</th><th colspan="5">Germplasm characterization in Millets</th></tr>
<tr><th>S. No</th><th>Activity</th><th>Name of the scientist and centre</th><th>2019-20</th><th>2020-21</th><th>2021-22</th><th>Deliverables</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Characterization of 927 Maize lines (27 traits)</td><td>Coimbatore
Dr. N.Kumari Vinodhana</td><td>100 lines</td><td>100 lines</td><td>100 lines</td><td rowspan="9">Characterisation and documen-tation of germplasm lines for further utilisation in the breeding programmes</td></tr>
<tr><td>Vagarai
Dr. K.R.V. Sathyasheela</td><td>100 lines</td><td>100 lines</td><td>100 lines</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Characterization of 1200 Sorghum lines (15 traits)</td><td>Coimbatore
Dr. D. Kavithamani</td><td>100 lines</td><td>100 lines</td><td>100 lines</td></tr>
<tr><td>Kovilpatti
Dr. N. Malini</td><td>100 lines</td><td>100 lines</td><td>100 lines</td></tr>
<tr><td>3</td><td>Characterization of 305 Finger Millet lines (31 traits)</td><td>Athiyandal
Dr. A. Nirmalakumari</td><td colspan="3" rowspan="5">Documentation and digitalization of the characterized lines</td></tr>
<tr><td>4</td><td>Characterization of 784 Foxtail Millet lines (28 traits)</td><td>Athiyandal
Dr. A. Nirmalakumari</td></tr>
<tr><td>5</td><td>Characterization of 184 Kodo Millet lines</td><td>Athiyandal
Dr. A. Nirmalakumari</td></tr>
<tr><td>6</td><td>Characterization of 175 Proso Millet lines (28 traits)</td><td>Athiyandal
Dr. A. Nirmalakumari</td></tr>
<tr><td>7</td><td>Characterization of 100 Barnyard Millet lines (28 traits)</td><td>Madurai
Dr. C. Vanniarajan</td></tr>
</table>

Theme No 2	**Evolution of Shoot fly and Midge resistant sorghum varieties**			
Theme Leader	**Dr. B. Selvi, Professor (PBG), Department of Millets, Coimbatore**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ expected out come**
Kovilpatti Dr.N. Malini, AP (PB&G) **Coimbatore** Dr.N.Kumaravadivel Professor and Head (DPMB&B)	• Effecting crosses with available donors for Shoot fly & midge resistance (CO 30 x IS18551) & (CO 30 x DJ 6514) • F_3 stabilised lines of IS 18551 x CO(S) 28 cross with shoot fly resistant QTLs will be utilised in the crossing programme **(June'19-Oct'19)**	• Effecting the double crosses **(Feb'20 – June'20)** • Evaluation of F1's for Shoot fly & Midge resistance **(July'20– Oct'20)**	• Raising and evaluation of F_3 at Coimbatore for both pests **(June'21-Sep'21)**	Identification of promising lines for for Shoot fly & midge resistance
		• Raising and evaluation of F_2 for midge resistance at Kovilpatti **(Nov'20– Feb'20)**	• Raising and evaluation of F4 at Kovilpatti **(Nov'21– Feb'21)** • Raising and Evaluation of F_5 at Coimbatore **(June-Oct'22)**	

Theme No 3	**Evolution of high yielding single cut forage sorghum varieties with improved quality traits**			
Theme Leader	Dr. D. Kavithamani, Asst.Prof (PBG), Department of Millets, Coimbatore			
Name of the scientist and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables / expected out come**
	• Effecting crosses of the promising cultures including five BMR lines with CO 27/K11 **(June'19 - Oct'19)**	• Evaluation of F_1's for green fodder yield (**Feb'20 – May'20)** • Raising and evaluation of F_2 based on leaf and stem characters **(July'20 – Oct'20)**	• Raising and Evaluation of F_3 **(Feb'21 – May'21)** • Raising and Evaluation of F_4 quality traits **(July'21 - Oct'21)**	Identification of promising single cut forage sorghum lines with desirable quality traits
			• Raising and Evaluation of F_5 and identification of high yielding BMR lines with desirable quality traits **(Feb'22- May'22)**	

Theme No 4	**Development of biofortified Pearl millet hybrids for high Fe and Zn**			
Theme Leader	Dr. K. Iyanar, Associate Professor (PBG), Department of Millets, Coimbatore			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ Expected out come**
Coimbatore Dr.T.Chitdeshwari Professor (SS&AC) **Coimbatore** Dr.I.Johnson Asst. Prof (Pl.Pathology)	• Screening of inbreds with high Fe and Zn coupled with high yield. (> 42ppm of Fe and >32 ppm of Zn) and screening them for downy mildew • Crossing of DM resistant lines (5) with high Fe and Zn lines (5) **(Jun19-Sept'19)**	• Advancing of F_2 (inbred line development) • Seed multiplication of biofortified hybrids (hybrid development) **(May'20 - Sept'20**)	• Advancing of F_4 • Seed multiplication of biofortified hybrids **(Jun'21-Sept'21)**	• Identification of new biofortified pearl millet hybrids with high Fe and Zn • Development of inbred lines for high Fe and Zn with downy mildew resistance
	• Evaluation F_1 for high yield and high Fe and Zn and simultaneous selfing for forwarding to F_2 (**Jan' 20 – May'20)**	• Advancing of F_3(inbred line development • Evaluation of hybrids at various centres for yield and high Fe and Zn **(Jan21 - May'21)**	• Advancing of F_5 (inbred line development) • Nomination of hybrids for MLT **(Dec'21-Apr'22)**	

Theme 5	**Screening of maize inbreds for Charcoal rot**			
Theme Leader	**Dr. N. Kumari Vinodhana, AP (PBG), Dept. of Millets, Coimbatore**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables**
Coimbatore Dr.Sendhilvel Asst.prof (Pl.Pathology)	• Raising of 100 inbred lines in sick plot • Screening of inbreds under sick plot condition and scoring for charcoal rot • Recording yield and related parameters to estimate yield loss • Identification of promising inbreds resistant to charcoal rot and utilization in the breeding program. • The lines showing high resistance for CR will be screened for *Turcicum* Leaf Blight (TLB)			Isolation of resistant germplasm sources /lines for breeding programme conferring resistance to charcoal rot

Theme 6	**Screening of maize inbreds and hybrids for drought tolerance**			
Theme Leader	**Dr. R. Ravikesavan, Professor and Head, Department of Millets, Coimbatore**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ Expected out come**
Coimbatore Dr.N.Kumari Vinodhana, AP (PBG), **Coimbatore** Dr.A.Senthil AP (CRP), **Vagarai**	• Screening of inbreds under induced drought at two locations and selection of tolerant inbreds **(Jun'19 - Oct'19)**	• Raising F_1 for drought screening & hybrid selection **(Jun'20 - Oct'20)**	• Seed multiplication of drought tolerant hybrids **(Jun'21 – Oct'21)**	• Identification of drought tolerant inbreds and utilization in breeding programme • Development of high yielding

Dr.K.R.V. Sathya Sheela, AP (PB&G), **Veppanthattai** Dr.S.Sivakumar Professor (PB&G)	• Crossing among the inbreds and development of new hybrids **(Dec'19 – Mar'20)**	• Evaluation of hybrids at various centres for yield and drought **(Dec'20 - May'21)**	• Nomination of hybrids for MLT **(Jan'22 - May'22)**	single cross maize hybrids suitable for water limiting environments

Theme 7	***Introgression of crtRB1*/ lcyE allele using marker-aided selection in to the elite inbreds of maize**			
Theme Leader	**Dr. R. Ravikesavan, Professor and Head, Department of Millets, Coimbatore**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ expected out come**
Coimbatore Dr.N.Senthil, Professor, DPMB&B,	• Effecting crosses UMI1200 β+ with UMI 1201, UMI 1205 and UMI 1223 **(Jun'19 - Oct'19)**	• Effecting the BC_2 cross • Marker assisted selection of BC_2 **(June' 20 - Oct'20)**	• Selection of back cross populations BC_3F_2 using the crtRB1 gene specific maker and estimation of β carotene through HPLC **(Jan'21- May'21)**	Development of proA-enriched maize inbreds and utilization of the inbreds in hybrid development
	• Raising F_1 , Selection of *crtRB1* gene specific marker in F_1 and backcrossing with recurrent parents (BC_1) • Marker assisted selection of BC_1	• Effecting the BC_3 cross • Marker assisted selection of backcross (BC_3) **(Oct'20- Jan'21)**	• Hybrid seed production **(June'21- Sept'21)** • Testing in station trials at three locations and nomination for MLT **(Oct'21 - May'22)**	

	population **(Jan'20 - May'20)**			

Theme 8	**Pyramiding of sh2 and su1 through MAS and development of high yielding sweet corn hybrids**			
Theme Leader	**Dr. R. Ravikesavan, Professor and Head, Department of Millets, Coimbatore**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ expected out come**
Coimbatore Dr.N.Senthil, Professor, DPMB&B,	• Screening sweet corn inbred lines for *sh2* and *su 1* alleles • Effecting crosses of shrunken endosperm lines (*sh2*) with *su 1* lines • Selection of F_1 - *su 1* allele specific marker (umc 1031) with shrunken endosperm (Sui donor SC11-2 & Sh2 donor SC1421-5-2-1) **(Jun'19 - Oct'19)**	• Raising F_2 and selection with markers **(June 20 - Oct'20)**	• Raising F_4 Selection of homozygous stabilized lines using the su1 gene specific maker and shrunken endosperm **(Feb'21 - May'21)**	• Identification of sweet corn inbred lines with *sh2* and *su 1* alleles • Development of High yielding sweet corn hybrids with *sh2* and *su1* endosperm background

	• Raising F_1 and backcrossing **(Dec'19 to Mar'20)**	• Raising F_3 and selection with markers **(Oct'20 - Jan'21)**	• Hybrid seed production using selected lines (**June'21-Sept'21)** • Station trials at two locations (**Oct'21-May'22)**	

Theme 9	**Farmers' participatory selection of high yielding Barnyard millet and long duration blast resistant Ragi varieties (CEM, ATL, AC&RI, Madurai, RRS, Paiyur)**			
Theme Leader	**Dr. A. Nirmala kumari, Professor (PBG), CEM, Athiyandal**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ expected out come**
Madurai Dr.Vanniarajan Professor and Head Dept. of Pl.Breeding and Genetics	**Mother trial : Ragi:** Test cultures 3 (TNEc 1310, TNEc 1301, OEB 604), Checks : 2 (CO 15, KMR 342): **Test locations:** Thali, Dhenkanikottai, **Barnyard millet:** Test cultures **4** (TNEf 318, TNEf 317, ACM 343, ACM 353) Check: MDU 1 **Test locations:** Thirumangalam, Paramakudi (**July–Nov'19)**	Seed multiplication for baby trials (**Dec'19-May'20)**	Validation of culture performance through OFT **(July'21-Nov'21)**	Evolution of high yielding Barnyard millet and long duration blast resistant Ragi varieties

	Fixing up the lines based on farmers preference			
	Laboratory analysis and Quality estimation of the elite lines preferred by the farmers **(Dec'19 - Mar'20)**	Baby trials 5 locations (Krishnagiri and Dharmapuri for ragi Thirumangalam, Paramakudi for barnyard millet) **(July'20-Nov'20)**	Drawing inference from data analysis and proposing for variety release **(Dec'21-Mar'22)**	
		Seed multiplication of preferred cultures for OFT **(Dec'20–May21)**		

Theme 10	**DNA fingerprinting of varieties/hybrids and pre- release cultures (2019 – 22)**			
Theme Leader	**Dr. N. Kumaravadivel, Professor and Head (DPMB&B)**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ expected out come**
Coimbatore Dr. N. Senthil, Professor, DPMB&B,	• Establishment of referral panel of standard SSR markers for varietal identification in millets • The prelease cultures in ART and land races collected every year will be fingerprinted for registration and varietal notification using codominant markers • Development of reference database using bioinformatics tools for marker and variety identification			DNA fingerprinting of varieties/hybrids and pre- release cultures of millets and forages

FORAGE CROPS

Theme No 1	**Development of high water use efficient Cumbu Napier hybrids**			
Theme Leader	**Dr. C. Babu, Professor and Head, Department of Forage Crops, Coimbatore**			
Name of the scientists and centre	**2019-20**	**2020-21**	**2021-22**	**Deliverables/ Expected out come**
Coimbatore Dr.T.Ezhilarasi Dr.S.D.Sivakumar **Coimbatore** Dr.V. Ravichandran Associate Professor (CRP)	• Screening of Napier germplasm for high water use efficiency under rainout shelter **(June 19 - May 20)**	• Raising crossing block with identified parents **(Aug. 20-Nov. 20)**	• Evaluation of F_1 hybrids for fodder yield **(June 21 – Mar. 22)**	• Development of high yielding water use efficient Cumbu Napier hybrids
Coimbatore Dr.G.Thiyagarajan Assistant Professor (SWC)	• Screening of available cumbu germplasm for quality aspects (DM > 25 % and CP > 15 %) **(June 19-May 20)**	• Hybridization between identified fodder cumbu and Napier grass **(Oct. 20– Jan. 21)**		

CROP MANAGEMENT

A. Decisions made on Adoption/OFT

A1. For Adoption

1. Enhancing water use efficiency and water productivity of maize - vegetable cropping systems

- Drip irrigation @ 100% Potential Evaporation (PE) level for maize - vegetables (Onion/Bhendi) cropping sequence is most efficient and economic in terms of water use efficiency and water productivity
- Drip system lay out: Raised bed (90cm), lateral spacing - 120 cm & water discharge - 4 lph
- Fertigation schedule: STCR based/blanket recommendation of fertilizer (Maize - 250:75:75 kg NPK/ha, Onion - 60:60:30 kg NPK/ha and Bhendi - 200:100:100 kg NPK/ha)

2. Nutrient management for hybrid maize in rainfed vertisol

- Application of 188:56:56kg NPK/ha for hybrid maize under rainfed vertisol ecosystem

3. Samai based cropping system for rainfed agro ecosystem

- Samai intercropped with redgram at 8:2 row ratio followed by horsegram for rainfed agro-ecosystem

4. Enhancing the productivity of Nutri-Cereals through supplemental irrigation and moisture conservation

- Crop residue mulch @ 2.5 t/ha + supplemental irrigation twice through mini portable sprinkler for rainfed samai and kuthiraivali

5. Validation of Fertiliser Prescription Equations under IPNS for pearl millet

- Validity of the fertiliser prescription equations for pearl millet (hybrid) on Perianaickenpalayam soil series has been proved.
- It revealed that targeting of 3.0 - 4.0t ha^{-1} of pearl millet under IPNS is found to be ideal in terms of yield (3.04 - 4.17t ha^{-1}), response ratio (11.80 - 11.10 kg kg^{-1}) and BCR (1.42 - 1.87) and soil fertility maintenance.
- Therefore, Soil Test Crop Response based fertiliser prescriptions under Integrated Plant Nutrition System (STCR-IPNS for 3.0 - 4.0t ha^{-1}) *i.e.* application of fertiliser N, P_2O_5 and K_2O based on initial soil test values along with FYM @12.5t ha^{-1} can be recommended for pearl millet (hybrids) on Periyanaickenpalayam series (Vertic Ustropept) and allied soil series of Tamil Nadu.

6. Test verification of Fertiliser Prescription Equations under IPNS for maize on Inceptisol

- The fertiliser prescription equations for hybrid Maize on Perianaickenpalayam soil series has been validated.
- It is concluded from six validation experiments that targeting of 9.0 - 10.0t ha^{-1} of maize under IPNS is found to be ideal in terms of yield (8.88 - 10.06 t ha^{-1}), response ratio (14.20 - 14.43kg kg^{-1}) and BCR (2.14 - 2.37) along with maintenance of soil fertility.
- Hence, Soil Test Crop Response based fertiliser prescriptions under Integrated Plant Nutrition System (STCR-IPNS for 9.0-10.0t ha^{-1}) *i.e.* application of fertiliser N, P_2O_5 and K_2O based on initial soil test values along with FYM @ 12.5t ha^{-1} can be recommended for hybrid maize on Periyanaickenpalayam series (Vertic Ustropept) and allied soil series of Tamil Nadu.

7. Soil Test Based Fertiliser Prescription for Desired Yield Target of Maize Under Integrated Plant Nutrition System On Vertisol

- The validity of the fertiliser prescription equations for hybrid Maize on Pilamedu soil series has been proved and showed that targeting of 10.0 - 11.0t ha^{-1} of hybrid maize under IPNS is found to be ideal in terms of yield (10.15 - 11.08t ha^{-1}), response ratio (14.05 - 13.95kg kg^{-1}) and BCR (2.17 - 2.27) besides soil fertility maintenance.
- Therefore, Soil Test Crop Response based fertiliser prescriptions under Integrated Plant Nutrition System (STCR-IPNS for 10.0 - 11.0 t ha^{-1}) *i.e.* application of fertiliser N, P_2O_5 and K_2O based on initial soil test values and FYM @12.5t ha^{-1} can be recommended for hybrid Maize on Pilamedu series (Typic Haplustert) and allied soil series of Tamil Nadu.

8. Screening and evaluating maize hybrids for lime induced Fe chlorosis in calcareous soils

- Screening of maize hybrids and their parents for lime induced Fe chlorosis in calcareous soils revealed that the hybrids CO 6, CO 8 and CO 7 were found tolerant to Fe chlorosis while the parent UMI 1230 was highly susceptible to Fe chlorosis in calcareous soils.
- Evaluation of tolerant maize hybrids with various Fe management strategies to improve the crop yield and soil health indicated that soil application of 40 kg S as elemental sulphur either with 5 kg Fe EDTA or 50 kg $FeSO_4$ + 12.5t FYM ha^{-1} was effective in increasing the crop yields by 20-25% besides improving the Fe availability in soil and its uptake by maize.

A2. For OFT

OFT 1. Evaluation of Zn and Fe formulations for foliar nutrition of hybrid Maize

Objectives: To assess the newly developed Zn and Fe chelate formulations on yield and economics of hybrid maize

Centres:

HC&RI, Periyakulam : Dr. P. Malathi, Asst. Professor (SS&AC)
Dept .of SS &AC, Coimbatore : Dr. D. Jegadeeswari, Assoc. Prof. (SS&AC)
ARS, Bhavanisagar : Dr. D. Muthumanickam, Professor (SS&AC)

Coordinating scientist: Dr. P. Malathi, Asst. Professor (SS&AC), HC&RI, Periyakulam

Treatments

T_1 - Recommended NPK as per STCR-IPNS
T_2 - Foliar spraying of 0.5% $ZnSO_4$ + 1% $FeSO_4$ + 0.1% citric acid
T_3 - Foliar spraying of 0.5 % Zn EDTA + 1.0 % Fe EDTA
T_4 - Foliar spraying of 0.5 % Zn citrate +1.0 % Ferric citrate

Observations to be recorded:

Growth and yield parameters, yield, economics, Fe & Zn content and uptake and soil available Zn and Fe

B. Research Projects on Millets

Crop	Centre	URP	AICRP	EFP	Total
Agronomy					
Sorghum	Dept. of Agronomy, Coimbatore	-	3	-	**3**
	ARS, Kovilpatti	1	1		**2**
Pearl Millet	Dept. of Agronomy, Coimbatore	-	3	-	**3**
Maize	Dept. of Agronomy, Coimbatore	1	6	-	**7**
	WTC, Coimbatore	1	-	-	**1**
	MRS, Vagarai	3	5	-	**8**
	CRS, Veppanthattai	1	-	-	**1**
	ARS, Kovilpatti	-	1	-	**1**
Finger Millet	ADAC&RI, Trichy	1	-	-	**1**
	CEM, Athiyandal	1	-	-	**1**
Minor Millets	CEM, Athiyandal	4	5	-	**9**
	ARS, Kovilpatti	1	-	-	**1**
Total		**14**	**24**	**-**	**38**
Sustainable Organic Agriculture					
Finger Millet	Dept of Sustainbale Organic Agriculture	1	1	-	**2**
Minor Millet	Dept of Sustainbale	-	1	-	**1**

	Organic Agriculture				
Total		**1**	**2**	**-**	**3**
Crop Physiology					
Finger Millet	Dept. of Crop Physiology, TNAU	1	-	-	**1**
Minor Millet	RRS, Paiyur	1	-	-	**1**
Total		**2**	**-**	**-**	**2**
Soil Science & Agricultural Chemistry					
Sorghum	ARS, Kovilpatti	1	-	-	**1**
Pearl Millet	Dept. of SS&AC, TNAU, Coimbatore	-	1	-	**1**
	Dept. of SS&AC, ADAC&RI, Trichy	-	1	-	**1**
Maize	Dept. of SS&AC, TNAU, Coimbatore	5	2	-	**7**
Finger Millet	Dept. of SS&AC, TNAU, Coimbatore	-	1	-	**1**
Minor Millets	Dept. of SS&AC, TNAU, Coimbatore	-	1	-	**1**
Total		**6**	**6**		**12**
Agricultural Microbiology					
Finger Millet	CEM, Athiyandal	-	-	1	**1**
Total		**-**	**-**	**1**	**1**
Seed Science & Technology					
Maize	Dept. of Seed Science & Technology, TNAU, Coimbatore	1	-	-	**1**
Minor Millet	Dept. of Seed Science & Technology, TNAU, Coimbatore	-	1	-	**1**
Total		**1**	**1**		**2**

C. Ongoing URPs /AICRPs / Externally Funded Projects

Agronomy		
University Research Project (URP) on Sorghum		
No.	**Project No. and Title**	**Remarks**
1	**DCM/KPT/AGR/SOR/2018/CP105** Evaluation of optimum age of seedling and crop geometry on growth and yield of transplanted sorghum (November, 2018 to May, 2021) Dr. S. Subbulakshmi, Asst. Professor (Agron.) ARS, Kovilpattti	• Project to be continued • Methods of nursery establishment to be standardized • Data/parameters to be observed may be discussed with Director (Crop Management) and the approved parameters may be observed for modelling study
University Research Project (URP) on Maize		
No.	**Project No. and Title**	**Remarks**
2	**DCM/CBE/ AGR/ AMS/ 2018/ CP126** Developing low cost agronomic management strategies in irrigated maize for the control of Fall Army Worm (*Spodoptera frugiperda*) in Western agro-climatic zone of Tamil Nadu (January, 2019 to March, 2021) Dr. R. Karthikeyan, Assoc. Professor (Agron.) Dept. of Agronomy, Coimbatore Dr. N. Muthukrishnan, Prof. (Agrl. Entomology) Dept. of Agrl. Entomology, Coimbatore	• Project to be continued
3	**DCM/CBE/AGR/MAZ/2017/001** Enhancing water use efficiency and water productivity of maize - vegetable cropping systems (July, 2017 to June, 2019) **WTC, Coimbatore (Coordinating Centre)** Dr. M. Senthivelu, Asst. Prof. (Agron.) Dr. K. Nagarajan, Professor (S&WCE) **AC&RI, Madurai:** Dr. N.K. Sathyamoorthy, Assoc. Prof. (Agron.) Dr. M. Rajeswari, Prof. (S&WCE) & Head **AEC&RI, Kumulur:** Dr. S. Vallal Kannan, Asst. Prof. (Agron.) Dr. K. Arunadevi, Asst. Prof. (S&WCE)	• Project to be closed • Result of the project may be recommended for adoption

Agronomy		
4	**DCM/VGI/AGR/MAZ/2018/001** Influence of detopping on growth, fodder and grain yield of rainfed Maize (*Zea mays* L.) (July, 2018 to June , 2020) Dr. Mohamed Amanullah, Professor (Agronomy) Maize Research Station, Vagarai	• Project to be continued • Studies on photosynthetic partitioning may be included • Result may given for information
5	**DCM/VGI/AGR/MAZ/2017/001** Optimizing the pre emergence herbicide and time of post emergence weed management practice in Irrigated Maize (June , 2017 to May, 2021) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project to be continued • Treatments / treatment combination in respect of herbicide dose may be modified in discussion with Professor & Head (Agronomy), Coimbatore
6	**DCM/VGI/AGR/MAZ/2018/CP110** Evaluation of drought mitigation strategy and irrigation scheduling to increase irrigation use efficiency and grain yield of maize (2018 - 2019) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project to be continued • Treatments under irrigation interval may be modified in discussion with Professor & Head (Agronomy), Coimbatore
7	**On-Farm Trial (OFT)** Nutrient management for hybrid maize in rainfed vertisol (May, 2018 to June, 2019) **CRS, Veppanthattai (Coordinating Centre)** Dr. N. Meyyazhagan, Professor (Agronomy) **TCRS, Yethapur** Dr. P. Kathirvelan, Asst. Professor (Agronomy)	• Result of the OFT may be recommended for adoption
University Research Project (URP) on Finger Millet		
8	**DCM/TRY/AGR/SMM/2018/001** Effect of irrigation scheduling on the performance of finger millet varieties in sodic soil of Trichy district, Tamil Nadu (May, 2018 to May, 2020) Dr. S. Avudaithai, Professor (Agronomy) & Head Dept. of Agronomy, ADAC&RI, Trichy	• Project to be continued
9	**DCM/ATL/AGR/SMM/2015/001** Evaluation of System of Finger millet (*Elusine*	• Project to be continued with revised treatments suitable

Agronomy		
	coracana) Intensification (SFI) for rainfed agro ecosystem of Tamil Nadu (August, 2018 to Dec., 2021) Dr. P. Parasuraman, Prof. (Agronomy) & Head CEM, Athiyandal	for both irrigated and rainfed ecosystem • The experiments may be conducted at CEM, Athiyandal (Rainfed) and RRS, Paiyur (Irrigated) • Result may given for information
University Research Project (URP) on Minor Millets		
10	**DCM/ATL/AGR/SMM/2018/CP049** Performance of kodomillet (*Paspalum scrobiculatum*) based intercropping system in irrigated and rainfed agro-ecosystem (August, 2018 to September, 2021) Dr. P. Parasuraman, Prof. (Agronomy) & Head Dr. K. Ananthi, Asst. Prof. (Crop Physiology) CEM, Athiyandal	• Project to be continued under irrigated and rainfed agro-ecosystem • Economic analysis may be done based on kodo millet equivalent yield • Result may given for information
11	**DCM/ATL/AGR/SMM/2016/002** Samai based cropping system for rainfed agro ecosystem (June, 2016 to May, 2019) **CEM, Athiyandal (Coordinating Centre)** Dr. K. Sivagamy, Asst. Professor (Agronomy) Dr. K. Ananthi, Asst. Prof. (Crop Physiology) CEM, Athiyandal **DARS, Chettinad** Dr. P. Kannan, Asst. Professor (SS&AC) Dr. T. Myrtle Grace, Prof. (Agronomy) & Head **RRS, Paiyur** Dr. N. Tamilselvan, Prof. (Agronomy) and Head Dr. M. Vijayakumar, Asst. Professor (SS&AC)	• Project to be closed • Result of the project may be recommended for adoption
12	**DCM/ATL/AGR/SMM/2015/001** Agronomic management to suit mechanization in small millet (Tenai) (June, 2016 to May, 2019) Dr. K. Sivagamy, Asst. Professor (Agronomy) Dr. K. Ananthi, Asst. Prof. (Crop Physiology) Dr. R. Mythili, Assistant Professor (Agrl.Engg.) CEM, Athiyandal	• Project to be closed • Result of the project may be recommended for adoption

Agronomy		
13	**WTC/ATL/AGR/SMM/2017/001** Enhancing the productivity of nutri-cereals through supplemental irrigation and moisture conservation (August, 2017 to May, 2019) **CEM, Athiyandal (Coordinating Centre)** Dr. P. Parasuraman, Prof. (Agronomy) & Head **RRS, Aruppukottai** R. Durai Singh , Professor (Agronomy) B. Bhakiyathu Saliha, Asst. Professor (SS&AC) **ARS, Kovilpatti** Dr. N. Anandaraj, Assistant Professor (SWC) Dr. V. Sanjivkumar, Assistant Professor (SS&AC)	• Project to be closed • Result of the project may be recommended for adoption
14	**DCM/KPT/AGR/SMM/2016/001** Minor millet based contingency intercropping system for late monsoon sowing for southern district of Tamil Nadu (October, 2016 to May, 2019) Dr. B. Arthirani, Asst. Prof. (Agrl. Meteorology) ARS, Kovilpatti	• Project to be closed • Result of the project may given for information
Agronomy		
All India Coordinated Research Project (AICRP) on Sorghum		
15	**AICRP/PBG/CBE/SOR/006** Response of grain sorghum genotypes to different fertilizer levels (June, 2018 to May, 2019) Dr. N. Vadivel, Associate Professor (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet
16	**AICRP/PBG/CBE/SOR/006** Influence of soil moisture stress on later cuts of multi-cut forage sorghum (June, 2018 to May, 2019) Dr. N. Vadivel, Associate Professor (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet
17	**AICRP/PBG/CBE/SOR/006** Mechanization in *kharif* grain sorghum (June, 2018 to May, 2019) Dr. N. Vadivel, Associate Professor (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet • After the confirmation trial, experiment may be proposed for OFT

Agronomy		
18	**AICRP/ DCM/ KPT/AGR/003** Response of sorghum varieties to sowing windows (September, 2016 to July 2019) Dr. S. Subbulakshmi, Asst. Professor (Agron.) ARS, Kovilpattti	• Project may be continued as per the proceedings of the AICRP meet • Result may given for information
All India Coordinated Research Project (AICRP) on Pearl Millet		
19	**AICRP/PBG/CBE/PEM/009** Effect of mulching and hydrogel on the productivity of pearl millet under rainfed conditions (June, 2017 to May, 2020) Dr. M. Senthivelu, Assistant Professor (Agron.) Dept. of Millets, TNAU, Coimbatore	• Project to be continued as per the proceeding of the AICRP meet
20	**AICRP/PBG/CBE/PEM/009** Performance of different weed management practices on pearl millet productivity (June, 2018 to May, 2020) Dr. M. Senthivelu, Assistant Professor (Agron.) Dept. of Millets, TNAU, Coimbatore	• Project to be continued as per the proceeding of the AICRP meet
21	**AICRP/PBG/CBE/PEM/009** Nutrient management through organic sources in rainfed pearl millet (June, 2018 to May, 2020) Dr. M. Senthivelu, Assistant Professor (Agron.) Dept. of Millets, TNAU, Coimbatore	• Project to be continued as per the proceeding of the AICRP meet
All India Coordinated Research Project (AICRP) on Maize		
22	**AICRP/PBG/CBE/MAZ/004** Performance of pre release late maturity genotypes in Kharif under varying planting density and nutrient levels in PZ (June, 2018 to May,2019) Dr. A. P. Sivamurugan, Asst. Prof. (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet
23	**AICRP/PBG/CBE/MAZ/004** Performance of pre release medium maturity genotypes in *Kharif* under varying planting density and nutrient levels in PZ (June, 2018 to May,2019)	• Project may be continued as per the proceeding of the AICRP meet

Agronomy		
	Dr. A. P. Sivamurugan, Asst. Prof. (Agronomy) Dept. of Millets, TNAU, Coimbatore	
24	**AICRP/PBG/CBE/MAZ/004** Performance of pre release sweet corn genotypes in *Kharif* under varying planting density and nutrient levels in PZ (June, 2018 to May,2019) Dr. A. P. Sivamurugan, Asst. Prof. (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet
25	**AICRP/PBG/CBE/MAZ/004** Ecological intensification for climate resilient maize based cropping systems (Greengram - Maize) (June, 2018 to May,2019) Dr. A. P. Sivamurugan, Asst. Prof. (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet
26	**AICRP/PBG/CBE/MAZ/004** Integrated nutrient management in maize (June, 2018 to May,2019) Dr. A. P. Sivamurugan, Asst. Prof. (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project may be continued as per the proceeding of the AICRP meet
27	**No. DR/P2/ICAR/AICRP on W/ASO / 2018/of the DR, TNAU, Cbe/ Dt.04.07.2018** **ICAR - AICRP on Weed Management** Weed management in maize - sunflower - dhaincha (*Sesbania aculeata*) based conservation agriculture system (June, 2018 to May, 2020) Dr. P. Murali Arthanari, Assoc. Prof. (Agron.) Dr. C. Bharathi, Assistant Professor (SS&AC)	• Project to be continued • Result may be given for information
28	**AICRP/PBG/VGI/MAZ/005** Effect of planting density and nutrient management practices on the performance of hybrids in *rabi* season (June, 2017 to May, 2018) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project may be continued as per the proceeding of the AICRP meet

Agronomy		
29	**AICRP/PBG/VGI/MAZ/005** Ecological intensification for climate resilient maize based cropping systems (Pulse-Maize) - Maize (April, 2014 to May, 2019) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project may be continued as per the proceeding of the AICRP meet
30	**AICRP/PBG/VGI/MAZ/005** Performance of pre release baby corn genotypes in *kharif* under varying planting density and nutrient levels (June, 2017 to May, 2019) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project may be continued as per the proceeding of the AICRP meet
31	**AICRP/PBG/VGI/MAZ/005** Performance of pre release rainfed medium maturity genotypes in *kharif* under varying planting density and nutrient levels (April, 2014 to March, 2019) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project may be continued as per the proceeding of the AICRP meet
32	**AICRP/PBG/VGI/MAZ/005** Ecological intensification for climate resilient maize based cropping systems (Pulse-Maize) - Greengram (April, 2014 to March, 2019) Dr. P. Thukkaiyannan, Asst. Prof. (Agronomy) Maize Research Station, Vagarai	• Project may be continued as per the proceeding of the AICRP meet
33	**AICRP/ DCM/ KPT/ AGR/003** Effect of micro environments on phenology, thermal requirements and grain yield of prominent rabi maize hybrids under rainfed condition. (September, 2015 to March, 2021) Dr. G. Sudhakar, Asst. Professor (Agronomy) ARS, Kovilpatti	• Project may be continued as per the proceeding of the AICRP meet • Result may given for information

Agronomy		
All India Coordinated Research Project (AICRP) on Minor Millets		
34	**AICRP/PBG/ATL/SMM/008** Chemical weed control studies in kodo millet (June, 2018 to May, 2019) Dr. K. Sivagamy, Asst. Professor (Agronomy) CEM, Athiyandal	• Project may be continued as per the proceeding of the AICRP meet
35	**AICRP/PBG/ATL/SMM/008** Response of pre-released foxtail millet varieties to different levels of fertilizer under rainfed conditions (June, 2018 to May, 2019) Dr. K. Sivagamy, Asst. Professor (Agronomy) CEM, Athiyandal	• Project may be continued as per the proceeding of the AICRP meet
36	**AICRP/PBG/ATL/SMM/008** Enhancing the millet - system productivity with intercrops (June, 2018 to May, 2019) Dr. K. Sivagamy, Asst. Professor (Agronomy) CEM, Athiyandal	• Project may be continued as per the proceeding of the AICRP meet
37	**AICRP/PBG/ATL/SMM/008** Effect of different sowing windows (Varagu, Samai and Kuthiraivalli) (June, 2018 to May, 2019) Dr. K. Sivagamy, Asst. Professor (Agronomy) CEM, Athiyandal	• Project may be continued as per the proceeding of the AICRP meet
38	**AICRP/PBG/ATL/SMM/008** Influence of low cost technologies through mechanization in Finger millet (June, 2018 to May, 2019) Dr. K. Sivagamy, Asst. Professor (Agronomy) CEM, Athiyandal	• Project may be continued as per the proceeding of the AICRP meet
Sustainable Organic Agriculture		
University Research Project (URP) on Finger Millet		
39	**DCM / CBE / AGR / SMM / 2018 / CP011** Developing organic package of practices for finger millet (August, 2018 to July, 2020)	• To be continued

Sustainable Organic Agriculture		
	Dr. E. Somasundaram, Prof. (Agron.) & Head Dept. of Sustainable Organic Agrl., TNAU	
All India Coordinated Research Project (AICRP) on Finger Millet		
40	**ICAR/DCM/CBE/SOA/2015/R001** Network Project on Organic Farming : Evaluation of organic, inorganic and integrated production systems in Finger millet (August, 2013 to August 2018) Dr. E. Somasundaram, Prof. (Agron.) & Head Dr. K. Ganesan Asst. Prof. (Agrl. Entomology) Dept. of Sustainable Organic Agrl., TNAU	• To be closed/continued as per the proceeding of the NPOF, ICAR
All India Coordinated Research Project (AICRP) on Minor Millets		
41	**ICAR/DCM/CBE/SOA/2015/R001** Network Project on Organic Farming : Evaluation of organic, inorganic and integrated production systems in Barnyard millet (August, 2013 to August 2018) Dr. E. Somasundaram, Prof. (Agron.) & Head Dr. K. Ganesan Asst. Prof. (Agrl. Entomology) Dept. of Sustainable Organic Agrl., TNAU	• To be closed/continued as per the proceeding of the NPOF, ICAR
Crop Physiology		
University Research Project (URP) on Finger Millet		
42	**DCM/CBE/CRP/CSF/2018/CP009** Development of crop specific foliar formulations for yield enhancement in selected crops (rice, redgram, sesame and finger millet) under normal and water deficit environments (June, 2018 to May, 2019) Dr. P. Jeyakumar, Prof. (Crop Physiol.) & Head Dept. of Crop Physiology, TNAU, Coimbatore Dr. C.N. Chandrasekhar, Prof. (Crop Physiol.) Dr. T. Sivakumar, Assoc. Prof. (Crop Physiology) Dr. S. Srinivasan, Asst. Prof. (Crop Physiology) Dr. N. Sritharan, (Crop Physiology)	• To be continued • Foliar formulation may be developed and evaluated as per the technical programme

Crop Physiology		
University Research Project (URP) on Minor Millets		
43	**DCM / PAI / CRP / SMM / 2018 / 001** Physiological manipulation of source and sink in Samai (August, 2018 to July, 2020) Dr. R. Sivakumar, Asst. Prof. (Crop Physiology) RRS, Paiyur	• To be continued with revised treatments in *kharif* season • Boric acid spray @ 0.3% may be revised as 0.2% concentration
Soil Science & Agricultural Chemistry		
University Research Project (URP) on Sorghum		
44	**NRM/KPT/SAC/SOR/2019/001** Yield maximization through optimization of nutrients for Dual sorghum (K12) in different land configurations of dryland Vertisols tract of Southern Tamil Nadu (October, 2018 to September, 2021) Dr. K. Baskar, Professor (SS&AC) ARS, Kovilpattti	• Project to be continued
University Research Project (URP) on Maize		
45	**NRM/CBE/SAC/2013/004** Permanent Manurial Experiment of Coimbatore Under irrigated Tropical Agro Ecosystem (Maize-Sunflower cropping sequence) (November, 2013 to October, 2018) Dr. M. Malarkodi, Assistant Professor (SS&AC) Dept. of SS&AC, Coimbatore	• Completion report may be submitted • Yield target may be revised at higher level • Result may given for information
46	**NRM/CBE/SAC/MAZ/2016/001** Screening and evaluating maize hybrids for lime induced Fe chlorosis in calcareous soils (July, 2016 to June, 2019) Dr. T. Chitdeshwari, Professor (SS&AC) Dept. of SS&AC, Coimbatore Dr. R. Ravikesavan, Professor (PB&G) & Head, Dept. of Millets, TNAU, Coimbatore Dr. A. Senthil, Assoc. Prof. (Crop Physiology) Dept. of Crop Physiology, TNAU, Coimbatore Dr. A.P. Sivamurugan, Asst. Prof. (Agronomy) Dept. of Millets, TNAU, Coimbatore	• Project to be closed • Result of the project may be recommended for adoption

Soil Science & Agricultural Chemistry		
47	**NRM/CBE/SAC/MAZ/2016/002** Development, characterization and evaluation of new chelated zinc and iron formulations for Maize crop (July, 2016 to June, 2019) Dr.P.Malathi, Assistant Professor (SS&AC) Dept. of SS&AC, Coimbatore	• Result of the project may be recommended for OFT with suitable treatment details
48	**NRM / CBE / SAC /MA2/ 2018/ CP 012** Economizing Phosphorus Use in Maize - Groundnut Production by Exploiting Native Phosphorus Build up in Soil (August, 2018 to July, 2020) Dr. S. Meena, Professor (SS&AC) Dept. of SS&AC, Coimbatore	• Project to be continued • Result may given for information
49	**NRM/CBE/SAC/LTM/2018/CP063** Impact of long-term organic and inorganic nutrient management on soil biochemical and biological processes for soil health sustainability (Maize- Sunflower cropping sequence) (November, 2018 to March, 2019) Dr. M. Malarkodi, Assistant Professor (SS&AC) Dept. of SS&AC, Coimbatore	• Project to be continued • Soil biomass carbon status may be correlated with soil microbial population
All India Coordinated Research Project (AICRP) on Sorghum		
50	**AICRP/NRM/TRY/005** Evaluation of different crops for their tolerance to sodicity levels (April, 2018 to March, 2019) Dr. P. Balasubramaniam, Prof. (SS&AC) & Head Dept. of SS&AC, ADAC&RI, Trichy	• Project may be continued as per the proceeding of the AICRP meet
All India Coordinated Research Project (AICRP) on Pearl Millet		
51	**AICRP/NRM/CBE/SAC/002** Validation of fertilizer prescription equations under IPNS for pearl millet (2017-2019) Dr. R. Santhi, Prof. (SS & AC) & Director (NRM) TNAU, Coimbatore	• Result of the project may be recommended for adoption

Soil Science & Agricultural Chemistry		
All India Coordinated Research Project (AICRP) on Maize		
52	**AICRP/NRM/CBE/SAC/002** Test verification of Fertiliser Prescription equations under IPNS for maize on Inceptisol (2017 - 2019) Dr. M. Gopalakrishnan, Asst. Professor (SS&AC) Dept. of SS&AC, Coimbatore	• Result of the project may be recommended for adoption
53	Soil Test Based Fertiliser Prescription for Desired Yield Target of Maize under Integrated Plant Nutrition System on Vertisol ***(Student Thesis)*** Dr. R. Santhi, Prof. (SS & AC) & Director (NRM) TNAU, Coimbatore	• Result of the project may be recommended for adoption
All India Coordinated Research Project (AICRP) on Finger Millet		
54	**AICRP/NRM/CBE/SAC/002** AICRP on Long Term Fertilizer Experiments-Soil Quality, Crop Productivity and Sustainability as influenced by Long Term Fertilizer Application and Continuous Cropping of Finger Millet-Maize sequence in Swell-Shrink Soil (2017 - 2020) Dr. D. Jayanthi, Associate Professor (SS&AC) Dr. M. Malarkodi, Assistant Professor (SS&AC) Dept. of SS&AC, TNAU, Coimbatore	• Project to be continued • Result may given for information
All India Coordinated Research Project (AICRP) on Minor Millets		
55	**AICRP/NRM/CBE/SAC/002** Soil Test Crop Response Correlation Studies through IPNS for Little Millet (*Panicum sumatrense*) (2017 - 2020) Dr. J. Balamurugan, Asst. Professor (SS&AC) Dept. of SS&AC, TNAU, Coimbatore	• Project to be continued • Result may given for information
Agricultural Microbiology		
Externally Funded Project - Finger Millet		
56	Decoding microbiome associated with Finger millet : A holistic approach on their metabolites and mechanisms towards crop fitness	• Project to be continued • Result may given for information

Agricultural Microbiology		
	(November, 2018 to October, 2019) Dr. P. Parasuraman, Prof. (Agronomy) & Head, CEM, Athiyandal Dr. T.C. K. Sugitha, Post Doctoral Fellow, Dept. of Ag. Microbiology, TNAU, Coimbatore Dr. U. Sivakumar, Prof. (Agrl. Microbiol.) Dept. of Ag. Microbiology, TNAU, Coimbatore	
Seed Science & Technology		
University Research Project (URP) on Maize		
57	**SEC/CBE/SST/MAZ/2018/CP075** Assessing the seed maturity and vigour of groundnut and maize crops using Chlorophyll fluorescence technique (November, 2018 to October, 2019) Dr. D. Thirusendura Selvi, Asst. Prof. (SS&T) Dept. of Seed Science & Tech., Coimbatore	• Objectives of the project may be revised • Result may given for information
All India Coordinated Research Project (AICRP) on Minor Millets		
58	**AICRP/STR/CBE/SEP/001** Integrated approach for enhancing seed yield and quality in Millets (2016 - 2020) Dr. C. Vanitha, Assistant Professor (SST) Dept. of Seed Science & Tech., Coimbatore	• Project to be continued

D. General remarks

1. Role of Agricultural Microbiologist and Crop Physiologist may be included in millet research especially under dryland ecosystem
2. Weather wise farm advisory services are to be provided to the farming community for achieving desirable yield

E. Action Plan (2019-2022)

Action Plan 1: Performance evaluation of pre release sweet corn hybrid (CSCH-15001) under varying planting density and nutrient levels					
Theme leader: Dr. A.P. Sivamurugan, Asst.Prof (Agron), Department of Millets, Coimbatore					
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**2021-22**	**Deliverables/expected out come**
• To study the response of pre-release sweet corn hybrid to different planting density and NPK levels with their interactions **Treatments** **Main plot: Hybrids** H_1: CSCH-15001 H_2: MISTHI **Sub plot: Planting density** D_1:60 x 15 cm D_2:60 x 20 cm **Sub sub plot: Nutrient levels** N_1: 100 % RDF (120:60:45 NPK kg/ha) N_2: 90 % RDF N_3: 80 % RDF	**Department of Millets, Coimbatore** Dr. A.P. Sivamurugan Asst.Prof (Agron) Dr. R. Ravikesavan Professor and Head **Department of Agronomy, Coimbatore** Dr. C. Bharathi Asst. Prof (SS&AC)	• Project proposal and approval • Experiment layout and sowing • Crop management, monitoring and observation • Harvest and data processing	• Confirmative trial	• Data processing and report preparation	• Suitable spacing and NPK levels for sweet corn hybrid will be identified

Action Plan 2: Optimizing spacing and nutrient levels for pre release late maturity maize hybrids					
Theme leader: Dr. A.P. Sivamurugan, Asst.Prof (Agron), Department of Millets, Coimbatore					
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**2021-22**	**Deliverables/expected out come**
• To optimize spacing and nutrient levels for pre release late maturity maize hybrids **Treatments** **Main plot: Density** D_1:60 x 25 cm D_2:60 x 20 cm **Sub plot: Nutrient levels** N_1: 100 % RDF (250:75:75 NPK kg/ha) N_2: 90 % RDF **Sub sub plot: Hybrids** G_1: CMH11-586 G_2: CMH12-686 G_3: CMH15-005 G_4: COH (M) 6 G_5: NK6240	**Department of Millets, Coimbatore** Dr. A.P. Sivamurugan Asst.Prof (Agron) Dr. R. Ravikesavan Professor and Head **Department of Agronomy, Coimbatore** Dr. C. Bharathi Asst. Prof (SS&AC)	• Project proposal and approval • Experiment layout and sowing • Crop management, monitoring and observation • Harvest and data processing	• Confirmative trial	• Data processing and report preparation	• Suitable spacing and NPK levels for late maturity maize hybrids will be identified

Action Plan 3: Studies on performance of prerelease pearl millet hybrids under different spacing and nutrient levels					
Theme leader: Dr. M. Senthivelu, Asst.Prof (Agron), Department of Millets, Coimbatore					
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**2021-22**	**Deliverables/expected out come**
• To optimize spacing and nutrient levels for pre release pearl millet hybrids **Treatments** **Main plot: Genotypes** G_1: TNBH 08804 G_2: TNBH 5767 G_3: TNAU Cumbu Hybrid CO 9 (check) **Sub plot: Density** D_1:45 x 15 cm D_2: 50 x 15 cm **Sub sub plot: Nutrient levels** N_1: 120 % RDF N_2: 100 % RDF (80:40:40 NPK kg/ha) N_3: 80 % RDF	**Department of Millets, Coimbatore** Dr. M. Senthivelu Asst.Prof (Agron) Dr. K. Iyanar Assoc. Prof (PBG) **Department of Agronomy, Coimbatore** Dr. A. Renuka Devi Asst. Prof (SS&AC)	• Project proposal and approval • Experiment layout and sowing • Crop management, monitoring and observation • Harvest and data processing	• Confirmative trial	• Data processing and report preparation	• Suitable spacing and NPK levels for pearl millet hybrids will be identified

Action Plan 4. Physiological characterization of minor millets for the traits associated with Photosynthesis				
Theme Leaders: Dr. A. Senthil, Associate Professor (Crop Physiology) & Dr. M. Djanaguiraman, Assistant Professor (Crop Physiology) Department of Crop Physiology, Coimbatore				
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**Deliverables/ expected out come**
• Assessing the leaf morphology and anatomy associated with photosynthesis of minor millets • Quantifying the variation in physiological and biochemical traits related to photosynthesis	Dr. A. Senthil, Assoc. Prof. (CRP) Dr. M. Djanaguiraman Asst. Professor (CRP) Dept. of Crop Physiology, Coimbatore	• Pot culture experiment with six minor millet crops • Observations on morphological and anatomical variations in leaves of six minor millets	• Study the alterations in photosynthetic efficiency and related traits in six minor millets • Data analysis and report preparation and submission	• The results of the study would pave the way for in-depth understanding of variations in C4 photosynthetic efficiency and its contributing traits among the small millets • Also, the study will lead to the next step in research on using the simple anatomical and physiological traits which are directly related to higher photosynthetic efficiency of crops might be utilized in crop improvement programmes

Action Plan 5: Dissecting the microbiome of little millet (*Panicum sumatransae* L.) and their mechanism of stress tolerance towards crop growth and fitness				
Theme Leader: Dr U. Sivakumar, Professor (Agricultural Microbiology), TNAU, Coimbatore				
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**Deliverables/ expected out come**
• Map the variation in the plant-niche level microbiome from rhizosphere to plant canopy • Understand the microbe induced functional capacity and metabolic fluxes of little millet	**Dept. of Agrl. Microbiology, Coimbatore** Dr U. Sivakumar Professor (Agrl. Micro.) TNAU, Coimbatore - 3	Microbiome and metabolites of potential microbe: Soluble metabolites, mVOCs, Root exudates, ROS enzymes and osmolytes, ACC deaminase, biofilm, phytohormones, nutrient mineralization, real time analysis of ethylene stress and defense genes, physiological and biochemical changes in the plant due to inoculation	Potculture experimental evaluation for crop growth and biometric observations	Identification of the potential microbe and their key interacting metabolite role for plant health

Action plan 6 : Seed pelleting for mechanized sowing of small millets				
Theme Leaders:– Dr. S. Lakshmi, Associate Professor (SST) Dr. G. Sasthri, Associate Professor (SST) Department of Seed Science & Technology, TNAU, Coimbatore				
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**Deliverables/ expected out come**
Preparation of seed pellets in small millets of finger millet, kodo millet, foxtail millet and little millet for mechanized sowing using air assisted seed drill	**1. DSST, TNAU, Coimbatore** Dr. S. Lakshmi, Assoc. Prof. (SST) Dr. G. Sasthri, Assoc. Prof. (SST) **2. Centre of Excellence in Millets, TNAU, Athiyandal** Dr. K. Parameshwari Asst. Prof. (SST) **3. AEC & RI, Kumulur** Dr. Alex Albert Asst. Prof.(SST) Dr. P. Mohan Kumar Asst. Prof. (Farm Machinery)	• Standardization of optimum size seed pellets for single seeding using seed drill • Evaluation of seed pellets for quality parameters under laboratory condition • Evaluation of seed pellets of small millets through air assisted seed drill sowing under field condition	• Confirmation trial on the evaluation of seed pellets of small millets through air assisted seed drill sowing under field condition	• Development of optimum size seed pellets for seed drill sowing with the advantage of reduced seed rate, uniform seedling establishment and enhanced seedling vigour

II.CROP MANAGEMENT - FORAGE CROPS

A. Decisions made on Adoption / OFT

A1. For Adoption

1. Optimizing the area of green fodder production for balanced nutrition to livestock

- Cultivation of 13.6 cents of green fodder (Cumbu Napier hybrid grass: 8.4 cents and Desmanthus: 5.2 cents) are needed for a milch animal with a milk yield of 10 lit./day/ animal.
- Cultivation of 2.3 cents of green fodder (Cumbu Napier hybrid grass: 1.2 cents and Desmanthus: 1.1 cent) are needed for a goat with average body weight of 40 kg.

A2. For OFT

OFT 1. Suitability of single budded setts in Cumbu Napier hybrid grass

Centres:

Dept. of Forage Crops, Coimbatore: Dr. S. D.Sivakumar, Assoc. Prof. (Agronomy)
Regional Research Station, Paiyur: Dr.N,Tamilselvan, Prof.& Head
Tamil Nadu Rice Research institute: Dr. M.Raju, Assoc. Prof. (Agronomy)
Regional Research Station,Vridhachalam:Dr.T.Parthipan,Assist. Prof. (Agronomy)
Dept. of Agronomy, AC & RI, Madurai: Dr. E.Subramanian, AP (Agronomy)
Dept. of Agronomy, AC & RI, Killikulam: Dr. Rajakumar, AP (Agronomy)

Treatment details:

T1: Horizontal planting of single budded setts with sett treatment
T2: Horizontal planting of single budded setts without sett treatment
T3: Vertical planting of two budded setts (Existing Practice)
(Sett treatment: 12 hours soaking in water+ 24 hours incubation)

Observations to be recorded:

a) Germination percentage (%)
b) Establishment percentage (%)
c) Plant height at harvest (cm)
d) No of tillers at harvest
e) Green fodder yield (kg/ha)
f) Economics

B. Research Projects on Forage crops

Centre	URP	AICRP	EFP	Total
Agronomy				
Dept. of Forage Crops, TNAU, Coimbatore	1	5	-	6
Dept. of Agronomy, TNAU, Coimbatore	1	-	-	1
Total	2	5	-	7

C. Ongoing URPs /AICRPs / Externally Funded Projects

Agronomy		
Sl. No.	**Project No. and Title**	**Remarks**
UNIVERSITY RESEARCH PROJECTS		
1	DCM/CBE/AGR/FRG/2019/001 Assessing the suitability of single budded setts in bajra napier hybrid grass CO (BN) 5 (June 2018– May 2019) Dr. S. D. Sivakumar Associate Professor (Agronomy) Dr. N.Sridharan Asst. Professor (CRP)	• The project to be closed. • The finding is recommended for OFT. • Completion report needs to be submitted in time.
2.	DCM/CBE/SAC/MAZ/2016/001 Economic evaluation of intensive cultivation of fodder maize and its impact on soil health Dr. K.SathiyaBama, Associate Professor (SS&AC) , Dr. R. Karthikeyan, Associate Professor (Agronomy), Dr. A. Ramalakshmi, AP (Agrl. Microb.) (August 2016 to July 2019)	• The project to be closed. • Salient findings may be given as information. • The results have to be consolidated and completion report may be submitted.
AICRP PROJECTS		
1.	Studies on Carbon sequestration in perennial grass based cropping system (R 15- AST-11 C) (June 2015– May 2019) Dr. S. D. Sivakumar Associate Professor (Agronomy)	• The project to be closed.

Agronomy		
Sl. No.	**Project No. and Title**	**Remarks**
2.	Economization of fertilizer dose for Cumbu Napier hybrid grass CO (BN) 5 through integrated nutrient management for enhancing yield and quality (K-16-AST-04) (June 2015– May 2019) Dr. S. D. Sivakumar Associate Professor (Agronomy)	• The project to be closed.
3.	Enhancing seed setting in Lucerne through foliar spray (R-16-AST-2) (June 2016– May 2019) Dr. S. D. Sivakumar Associate Professor (Agronomy)	• The project to be closed.
4.	Studies on the performance of top feeds under varied planting geometry with and without intercrop (K-17-AST-1) (June 2016 – May 2020) Dr. S. D. Sivakumar Associate Professor (Agronomy)	• The project may be continued.
5.	Effect of nitrogen levels on forage yield of promising entries of forage hybrid maize (AVTM-2) (June 2018 – May 2019) Dr. S. D. Sivakumar Associate Professor (Agronomy)	• The project to be closed.

D. General Remarks:

- Multi- tier fodder production system may be identified (Action: Department of Forage Crops)

E. Action Plan (2019-2022)

Action plan 1 : Optimizing the spacing and fertilizer levels in fodder maize pre release culture TNFM 131-9					
Theme leader: Dr. V. Geethalakshmi, Director, Crop Management, TNAU, CBE					
Activity	**Name of the scientist and centre**	**2019-20**	**2020-21**	**2021-22**	**Deliverables / expected out come**
•To optimize the spacing for achieving higher green fodder yield in fodder maize pre release culture TNFM 131-9 •To identify the suitable nutrient levels for higher yield and economics in fodder maize pre release culture TNFM 131-9 **Treatments** Main plot (Spacing) M1 : 30cm x 15cm M2:30 cmx 10 cm M3:20cm x 10 cm M4:40cm x 15 cm Sub plot (Nutrient levels) N1: 75% RDF N2: 100 % RDF N3: 125% RDF RDF: 60:40:20 kg NPK/ha Design: Split plot Replication :3	**Operating Centre**: Dept. of Forage Crops, Coimbatore- Dr.S.D.Sivakumar) Assoc.Prof.(Agron,) Dr.C.Babu Professor and Head Dr.R.Karthikeyan Assoc.Prof.(Agron,)	• Project proposal and approval • Experiment layout and sowing • Crop management, monitoring and observation • Harvest and data processing	• Confirmative trial	• On-Farm Trial (OFT) • Report preparation	• Suitable package of practice for achieving higher productivity in fodder maize pre release culture TNFM 131-9 may be developed

III. CROP PROTECTION

A. Decisions Made on OFT

A1. For Adoption

Management of Finger millet blast

Seed treatment with talc-based formulation of TNAU-Pf1 (10g/kg) plus two sprays of tricyclazole (0.1%) at maximum tillering phase and at heading phase is recommended.

A2. For OFT

OFT 1: Management of sorghum stem borer (*Chilo partellus*)

Treatments:

T1	IPM module viz., Calcium silicate application at 15 DAE (30 kg/ha), Intercropping sorghum + cowpea (4:1), Border cropping with cumbu napier (Two rows), Releasing egg parasitoid, *T. chilonis* at 20, 30 and 40 *DAE* @1,00,000 /ha., Spraying NSKE 5% at 45 DAE (Need based)
T2	Farmers practice (Chlorpyriphos 20EC @ 4ml/lit at ETL)
T3	Untreated control

Variety : PY2 /CO (Ra)14
Design : RBD
Replications : 7

Observations to be recorded:

- Per cent dead heart at 45 DAE
- Per cent stem tunneling at 55 DAE
- Grain yield (kg/ha) and straw yield (kg/ha)

Participating centres:

- TNAU,Coimbatore (Dr.S.Manimegalai)
- AC&RI, Killikulam (Dr. K. Elancheziyan)
- HC&RI (W), Trichy (Dr. M. Chandrasekaran)

OFT 2: Evaluation of *Acorus calamus* TNAU formulation against rice weevil, *Sitophilus oryzae* L. for long term maize seed storage

Treatments:

T1	*A. calamus* TNAU formulation @ 10 ml/kg of seed
T2	Malathion 5 D @ 10g/kg of seed
T3	Untreated control with release of insects
T4	Untreated control without release of insects (To study the germination)

Design: CRD
Replication: Six

Observations to be recorded:

- Assessment of population buildup (live and dead insects)
- Per cent seed damage
- Per cent weight loss
- Per cent germination after six months

Centres & Scientist incharge:

- MRS, Vagarai (Dr. N.M. Arivudainambi)
- TCRS, Yethapur (Dr. B. Geetha)
- RRS, Virudhachalam (Dr. S. Jayaprabavathi)

A3 For Information

Agricultural Entomology

- Volatile compound, n- Hentriacontane recorded in entries resistant to sorghum stem borer. It has kairomonal activity to egg parasitoid, *Trichogramma* sp.
- Volatile compound, n- Hexadecane recorded in entries resistant to sorghum shoot fly. It has feeding inhibition property.
- Sorghum seeds can be treated with 30 per cent CO_2 to protect from rice weevil, *Sitophilus oryzae* (Linnaeus) for 12 months without affecting seed viability

Plant Pathology

Maize

- Seed treatment + soil application of *P. fluorescens* recorded the lowest banded leaf sheath blight incidence (2.66%) and recorded the highest yield of 7042 kg/ha
- Foliar application of Hexaconozole (0.2%) recorded the lowest disease incidence of banded leaf sheath blight of (2.25 %) and recorded maximum yield of 6749 kg/ha

Pearl millet:

- The entries *viz*., PT 6687, PT 6303, PT 6317, UCC 35, UCC 36, UCC 37 and TNBH 121235 were free from downy mildew incidence
- The entries *viz*., TNBH 1605, PT 6029, PT 6067 and UCC 37 were showing less than 5.0 per cent downy mildew incidence.
- None of the entries were free from rust and the incidence (4.5 to 9.5 per cent).

B. Research Projects on Millets

Crop	Centre	URP	Core	AICRP	Ext. funded	Total
Agrl. Entomology						
Sorghum	Dept. of Millets, Coimbatore	1	-	-	-	1
Maize	Dept. of Millets, Coimbatore	-	1	1	-	2
Plant Pathology						
Sorghum	Dept. of Millets, Coimbatore	-	-	1	-	1
Maize	Dept. of Millets, Coimbatore	1	-	1	-	2
	MRS, Vagarai	2	-	-	-	2
Pearl millet	Dept. of Millets, Coimbatore	1	-	1	-	2
Ragi and Small millet	CEM, Athiyandal	-	-	1	-	1
	RRS, Paiyur	1	-	-	-	1
	DARS, Chettinad	1	-	-	-	1
	RRS, Vriddhachalam	-	-	-	1	1
Total		**7**	**1**	**5**	**1**	**14**

On-going URP / AICRP / Externally funded projects

Agricultural Entomology

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
Sorghum				
1.	**CPPS/CBE/ENT/SOR/2015/001** Screening of sorghum accession against major pests of sorghum and its management	Dr. S. Manimegalai, Professor (Entomology), Dept. of Agrl. Entomology, Coimbatore	Sep. 2015-Sep. 2018	The completion report of the project to be submitted on or before 30th June, 2019.
Maize				
2.	**DRES/VGI/AEN/014/001** Studies on the insect pests of maize and their natural enemies	Dr. N.M. Arivudainambi, Asst. Prof. (Entomology), MRS, Vagarai	December 2013-May 2018	A copy of the completion report to be submitted to the Director (CPPS). Three URPs

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
				may be prepared in consultation with Professor and Head, Dept. of Agrl. Entomology, TNAU, Coimbatore and Director (CPPS) and to be submitted on or before 30th June, 2019.
3.	**CPPS/VGI/ENT/MAZ/014/002** Evaluation of certain insecticides and bio control agent *Trichogramma chilonis* against stem borer *Chilo partellus* in maize	Dr. N.M. Arivudainambi, Asst. Prof. (Entomology), MRS, Vagarai	May 2014 - April 2018	
Core project				
Maize				
4.	**CPPS/CBE/ENT/MAZ/2018/ CP073** Management strategies for fall armyworm, *Spodoptera frugiperda* in maize	Dr. N. Muthukrishnan, Professor (Entomology), Dept. of Agrl. Entomology, Coimbatore	2018-20	Large scale validation of the FAW management capsule shall be done all over Tamil Nadu utilizing the scientists of Research Stations.
AICRP				
Maize				
5.	**AICRP/PBG/CBE/MAZ/004** AICRP on Maize Improvement Screening	Dr. T. Srinivasan, Asst. Prof. (Entomology), Dept.	Continuous project	The project may be continued as per AICRP

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
	Evaluation of maize lines against major pests of maize and development of management strategies	of Millets, Coimbatore		technical programme

PLANT PATHOLOGY

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
Maize				
1	**CPPS/CBE/PAT/MAZ/2018/001** Biointensive management of charcoal rot in maize	Dr. P. Renukadevi, Assoc. Prof. (Pl. Pathology), FC&RI, Mettupalayam	Mar. 2018-Apr. 2021	Change of PL as Dr. V. Sendhilvel, Asst. Prof. (Pl. Pathology) may be intimated through DCPPS. The already reported biocontrol agents available in the Department of Plant Pathology may be included and proposal for mid-term correction to be submitted for approval. The fungicides may be tested at less than 50 ppm for their efficacy under laboratory conditions. The fungicides used for the study need to be checked for their label claim/ CIB registration. The project work may be continued.

2.	**CPPS/VGI/PAT/MAZ/2017/001** Management of Maize banded leaf and sheath blight (BLSB) caused by *Rhizoctonia solani* f. sp. *sasakii* with biocontrol agents and fungicides	Dr. K. Sethuraman, Professor (Pl. Pathology), Office of DSW, Coimbatore	July 2017-June 2020	Change of PL as Dr. R. Radhajeyalakshmi to be communicated to the Director of Research on or before 15th June 2019. A trial may be initiated including effective biocontrol agent and VAM in combination. Correlation of disease incidence with weather parameters to be studied and submitted to Director (CPPS). The project may be continued.
3.	**CPPS/VGI/PAT-MAZ/2016-001** Management of leaf blight diseases of maize caused by (*Helminthosporium turcicum* (Pass) and *Bipolaris maydis* (Nisik. and Miyake).	Dr. R. Radhajeyalakshmi Asst. Prof. (Pl. Pathology), MRS, Vagarai	July 2016 - June 2019	One more trial has to be taken up in the station and another trial in a farmers holding during *kharif*, 2019 and the closure proposal may be submitted before 30th December, 2019. A separate extension proposal may be submitted in time. Three URPs have to be submitted before 30 th June, 2019 in consultation with the Professor and Head, Dept. of Plant Pathology, TNAU, Coimbatore
Pearl Millet				
4.	**CPPS/CBE/PAT/SMM/2018/001** Biological management of pearl millet rust disease using mycoparasite, *Sphaerellopsis filum*	Dr. I. Johnson, Asst. Prof. (Pl. Pathology), Dept. of Millets,	April 2018-March 2021	The species may be mentioned as *Sphaerellopsis paraphysata.*

	(Biv.) B.Sutton	Coimbatore		Molecular confirmation has to be repeated. The project may be continued.
		Small Millets		
5.	**CPPS/ATL/PAT/SMM/2014/001** Assessment and management of seed borne pathogens infection of Finger millet (*Elusine coracana* (L.) Gaertn.) in Tiruvannamalai District of Tamil Nadu.	Dr. M. Rajesh, Asst. Prof. (Pl. Pathology), CEM, Athiyandal	October 2014 – September 2017	The project should have been completed by 2017 and the closure proposal has not been submitted by the scientist as per the recommendations of the previous meet. Hence the Professor & Head, CEM, Athiyandal is requested to initiate action against the scientist and due explanation of the scientist may be forwarded to Director (CPPS).
6.	**CPPS/PAI/PAT/SMM/2016/ 001** Management of finger millet blast	Dr. T. Anand, Asst. Prof. (Pl. Pathology), Seed Centre, TNAU, Coimbatore	Oct. 2016 – Sept. 2019	Project completion report to be submitted by September, 2019 without deviation.
7.	**CPPS/CTN/PAT/SMM/2016/001** Management of leaf blight and node blast diseases of Indian barnyard millet (*Echinochloa frumentacea* (Roxb)	Dr. M. Paramasivan, Asst. Prof. (Pl. Pathology), DARS, Chettinad.	Oct. 2016 – Sept. 2019	The project may be deleted and a new URP with clear objectives on management of foliar diseases of barnyard millet may be proposed

				on or before 30th June, 2019. One more URP on smut on barnyard millet to be submitted on or before 30th of June, 2019.
AICRP				
Sorghum				
8.	**AICRIP/PBG/CBE/SOR/006** Evaluation of AICRP trials in sorghum Performance of sorghum entries against major diseases under sick plot conditions	Dr.A.Sudha, Asst. Prof. (Pl. Pathology), Dept. of Millets, Coimbatore	Continuous project	The project may be continued as per AICRP technical programme
Maize				
9.	**AICRP/PBG/CBE/MAZ/004** AICRP on Maize Improvement Performance of maize entries against major diseases under sick plot conditions	Dr. P. Renukadevi, Assoc. Prof. (Pl. Pathology), FC& RI, Mettupalayam	Continuous project	The project may be continued as per AICRP technical programme
Pearl Millet				
10.	**AICRP/PBG/CBE/PEM/009** Evaluation of AICRP trials in Pearl millet Performance of pearl millet entries against major diseases under downy mildew sick plot conditions and management of Pearl millet downy mildew	Dr. I. Johnson, Asst. Prof. (Pl. Pathology), Dept. of Millets, Coimbatore	Continuous project	The project may be continued as per AICRP technical programme
Small Millet				
11.	**AICRP/PBG/ATL/SMM/008** AICRP on Small Millets	Dr. M. Rajesh, Asst. Prof. (Pl. Pathology), CEM, Athiyandal	Continuous project	The project may be continued as per AICRP technical programme

Externally Funded Projects				
Small Millet				
12.	**DST/CPPS/ATL/PAT/2016/R003** Population biology of *Magnaporthe grisea* and analysis of host plant resistance in foxtail millet against blast disease	Dr. G. Senthilraja, Asst. Professor (Pl. Pathology), RRS, Vridddhachalam	April 2017-Mar. 2020	The project may be continued as per the objectives of the externally funded project and work of the student may be periodically assessed by the Principal Investigator and the Professor and Head, Dept. of Plant Pathology, AC&RI, Madurai

C. General recommendations:

- All the Plant Protection scientists working in the stations need to have at least three URPs, and if working in AICRP schemes/ teaching campuses need to have at least one URP. Those who do not meet this criterion shall submit the URPs before 30th June 2019 after consulting with the Heads of Agrl. Entomology/ Pl. Pathology, TNAU, Coimbatore.

- The results pertaining to experiments involving screening of germplasms/ accessions/ inbred lines/ hybrids are to be submitted to the Head of the concerned Departments, simultaneously marking a copy to the Director (CPBG), Director (CPPS) and Professor & Heads (Pl. Pathology/ Dept. of Agrl. Entomology).

- With respect to screening of germplasms/ accessions/ inbred lines/ hybrids for resistance to pests and diseases, the screening work is to be undertaken by Entomologists/ Pathologists only, and in case if concerned scientists are not available in the unit, a scientist will be identified by the Dept. of Agrl. Entomology/ Dept. of Pl. Pathology, as the case may be, exclusively for the screening works.

- Scientists working in the AICRP schemes shall include treatments as per the local requirements, in addition to the treatments of their AICRP technical programme.
- The influence of Fall armyworm on disease incidence in maize to be recorded (**Action**: Plant Protection Scientists).
- Entomologists of different research stations are to attend the Monthly Zonal Workshops and deliver lectures on the FAW management strategies.
- All the Plant Pathologists working in research stations/ colleges should submit the microbial cultures (pathogens and biocontrol agents) being used in their experiments to the Professor and Head, Dept. of Plant Pathology on or before 30th June, 2019.
- All the Plant Pathologists are to include Accession numbers/ITCC/MTCC/ATCC while using biocontrol agenst for their experiments.
- Observations on seed borne pathogens may also be undertaken. The results of the work on stored maize/ sorghum, etc. may be sent to the Dept. of Millets for inclusion in the Scientists meet on Millets and Forage crops. (**Action**: Dr. R. Arulprakash, Asst. Professor (Agrl. Entomology), Seed Centre, TNAU, Coimbatore)
- An URP on sorghum disease management to be submitted before 30th June 2019 (**Action**: Dr. A. Sudha, Asst. Prof. (Plant Pathology))

D. Agricultural Entomology

Action Plan 1: Large scale validation of FAW management capsule

Theme Leader	**Dr. N. Muthukrishnan, Professor (Agrl. Entomology)**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected outcome**
• Soil application of neem cake @ 250 kg per ha and seed treatment with thiamethoxam 30 FS @ 10 g (or) *Beauveria bassiana*@ 10 g/ kg seed • Spacing of 60 x 25 cm for irrigated and 45 x 20 cm for rainfed maize and rogue spacing of 75 cm for every 10 rows • Border cropping of cowpea, sunflower or gingelly, and intercropping with black gram or green gram to attract, conserve and enhance activity of parasitoids and predators; Border cropping of Bajra Napier for irrigated maize or grain sorghum variety for rainfed maize to attract FAW adults on border crops • Solar light trap @ one /ha for monitoring FAW adults and natural enemies, and use sex pheromone traps @ 50/ha for mass trapping from 10-15 DAS • Spraying azadirachtin 1% EC 20 ml/10 l, emamectin benzoate 5 SG 4 g/ 10 l or	**Tamil Nadu:** Dr. K. Prabakar, Director, CPPS Dr. N. Sathiah, Prof. & Head (Ento) **Coimbatore** : Dr. N. Muthukrishnan, Professor (Entomology) **Tiruppur**: Dr. T. Srinivasan, Asst. Prof. (Entomology), Dept. of Millets, Coimbatore **Theni:** Dr. M. Kannan, Asst. Prof. (Entomology), HC&RI, Periyakulam **Tirunelveli**: Dr. N. Balakrishnan, Assoc. Prof. (Entomology), AC&RI, Killikulam **Thoothukudi**: Dr. M. Ravi, Asst. Prof. (Entomology), AC&RI, Killikulam, **Dindigul**: Dr. N.M. Arivudainambi, Asst. Prof. (Entomology), MRS, Vagarai **Vellore**: Dr. P. Thilagam, Asst. Prof. (Entomology), ARS, Virinjipuram **Salem & Namakkal**: Dr. B. Geetha, Assoc. Prof. (Entomology), TCRS,	GPS tagged data and Imagery Larval population per 10 plants Per cent damage on 15, 30, 45, 60 and 75 DAS Following Davis & Williams (1992) Population of natural enemies Yield (kg/ha)	Residue free maize and cost effective IPM capsule for farmers adoption

novaluron 10 EC 15 ml/10 l during early whorl stage (15 – 20 DAS); spraying *Metarhizium anisopliae* @ 1 x 10^8 cfu/g 80 g / 10 l, thiodicarb 75 WP 20 g/ 10 l, spinetoram 12 SC ml/ 10 l or during late whorl stage (40-45 DAS); and spraying flubendiamide 480 SC 3 ml /10 l or chlorantraniliprole 18.5 SC 5 ml / 10 l during tasselling and cob formation stage (60-65 DAS)	Yethapur **Thiruvallur**: Dr. V.A. Vijayashanthi, Asst. Prof. (Entomology), KVK, Tirur **Pudukottai**: Dr. S. Suganyakanna, Asst. Prof. (Entomology), AC&RI, Kudumianmalai **Madurai**: Dr. Zadda Kavitha, Asst. Prof. (Entomology), AC&RI, Madurai **Erode**: Dr. Sheela Venugopal, Asst. Prof. (Entomology), ARS, Bhavanisagar **Ariyalur and Perambalur**: Dr. V.R. Saminathan, Assoc. Prof. (Entomology), ADAC&RI, Trichy **Ramanathapuram**: Dr. J. Ramkumar, Asst. Prof. (Entomology), KVK, Ramnad **Krishnagiri and Dharmapuri**: Dr. P.S. Shanmugam, Asst. Prof. (Entomology), KVK, Paparappatti **Thiruvannamalai**: Dr. K. Govindan, Asst. Prof. (Entomology), AC&RI, Vazhavachanallur **Virudhunagar**: Dr. K. Sasikumar, Asst. Prof. (Entomology), CRS, Srivilliputhur **Trichy and Karur**: Dr. V. Baskaran, Asst. Prof. (Entomology), Institute of Agriculture, Kumulur **Pudukottai**: Dr. P. Pretheepkumar, Asst. Prof. (Entomology), NPRC,		

	Vamban **Thanjavur**: Dr. V.G. Mathirajan, Asst. Prof. (Entomology), Veppankulam **Cuddalore**: Dr. P. Indiragandhi, Asst. Prof. (Entomology), RRS, Vridhachalam		

Damage rating scale for assessment of leaf damage by maize Fall armyworm (Davis & Williams, 1992)

Explanation/definition of damage	**Rating**
No visible leaf damage	0
Only pin-hole damage	1
Pin-hole and small circular hole damage to leaves	2
Pinholes, small circular lesions and a few small elongated (rectangular shaped) lesions of up to 1.3 cm in length present on whorl and furl leaves.	3
Several small to mid-sized 1.3 to 2.5 cm in length elongated lesions present on a few whorl and furl leaves	4
Several large elongated lesions greater than 2.5 cm in length present on a few whorl and furl leaves and/or a few small- to mid-sized uniform to irregular shaped holes (basement membrane consumed) eaten from the whorl and/or furl leaves.	5
Several large elongated lesions present on sever-al whorl and furl leaves and/or several large uniforms to irregular shaped holes eaten from furl and whorl leaves.	6
Many elongated lesions of all sizes present on several whorl and furl leaves plus several large uniform to irregular shaped holes eaten from the whorl and furl leaves.	7
Many elongated lesions of all sizes present on most whorl and furl leaves plus many mid- to large-sized uniform to irregular shaped holes eaten from the whorl and furl leaves.	8
Whorl and furl leaves almost totally destroyed	9

Damage rating scale for assessment of corn ear and kernel damage by maize Fall armyworm (Davis & Williams, 1992)

Explanation/definition of damage	Rating
No damage to any ears	1
Tip (<3cm) damage to 1-3 ears	2
Tip damage to 4-7 ears	3
Tip damage to 7 and more ears and damage to 1-3 kernels below ear tips on 1-3 ears	4
Tip damage to 7 and more ears and damage to 1-3 kernels of 4-6 ears	5
Ear tip damage 7-10 ears and damage to 1-4 kernels below tips of 7-10 ears	6
Ear tip damage to 7-10 ears and damage to 4-6 destroyed on 7-8 ears	7
Ear tip damage to all ears and 4-6 kernels destroyed on 7-8 ears	8
Ear tip damage to all ears and 5 or more kernels destroyed below tips of 9-10 ears	9

Action Plan 2: Screening maize germplasms for resistance against FAW

Theme Leader	**Dr. T. Srinivasan, Asst. Prof. (Agrl. Entomology), TNAU, Coimbatore**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Field level screening for FAW resistance of maize inbred lines and parental lines of promising hybrids	Dept. of Millets, TNAU, Coimbatore Dr. T. Srinivasan Dr. N. Kumari Vinodhana MRS, Vagarai Dr. N.M. Arivudainambi Dr. K.R.V. Sathyasheela	Recording resistance levels using Davis & Williams (1992) scale (1-9) Ear damage using rating scale (1-9)	Identification of Resistant inbred lines

Action Plan 3: Survey on major pest and diseases on millets

<table>
<tr><td>Theme Leader</td><td colspan="3">Dr. G. Srinivasan, Assoc. Prof. (Ento), AC&RI, Madurai</td></tr>
<tr><td>Action Plan</td><td>Name of the scientist(s) and centre</td><td>Activity</td><td>Deliverables/ expected out come</td></tr>
<tr><td rowspan="2">Survey on major pest and diseases on millets

Survey for occurrence of major pest and diseases</td><td>• Maize, Sorghum & Kudiraivali
Location: Madurai, Kovilpatti
Dr. G. Srinivasan, AC&RI, Madurai,
Dr. Mareeswari, ARS, Aruppukottai
• Maize, Sorghum, Pearl millet
Location: Dindigul, Udumalpet & Tiruppur
Dr. N.M. Arivudainambi &
Dr. R. Radhajeyalakshmi, MRS, Vagarai
• Ragi, Tenai, Pearl millet, Samai
Location: Tiruvannamalai, Vellore, Villupuram
Dr. M. Rajesh, CEM, Athiyandal
Dr. K. Govindan, AC&RI, Vazavachanur
• Maize, pearl millet, ragi, Varagu, Tenai
Location: Tindivanam, Perambalur, Cuddalore
Dr. G. Senthilraja &
Dr. Indiragandhi, RRS, Vridhachalam</td><td>Fixed plot on/off campus

Roving survey in millet growing regions

Periodical recording of weather parameters</td><td rowspan="2">Regression model for pest and diseases of millets</td></tr>
<tr><td>Weather correlation
Dr. S. Kokilavani, ACRC, TNAU, Coimbatore</td></tr>
</table>

Action Plan 4: Botanicals for the management of stored pests of sorghum

Theme Leader	**Dr. R. Arulprakash, Assistant Professor (Agric. Entomology), Seed Centre, Coimbatore**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Evaluation of the following botanical leaf powders @ 1 per cent • T1 - *Catharanthus roseus* (Periwinkle) • T2 - *Vitex negundo* (Nochi) • T3 - *Calotropis gigantea* (Milkweed) • T4 - *Azadirachta indica* (Neem) • T5 - *Annona squamosa* (Custard apple) • T6 - *Acorus calamus* TNAU formulation @ 10 ml / kg of seed • T7 – Control Replication: Three Design: CRD	Dr. M.R. Srinivasan, AC&RI, Killikulam Dr. Zadda Kavitha, AC&RI, Madurai Dr. V.R. Swaminathan, HC&RI (W), Trichy Dr. V. Radhakrishnan, AC&RI, Vazhavachanur	Bioefficacy study at monthly intervals for a period of six months Assess the population build up (Live and dead insects), per cent seed damage and weight loss. Record germination per cent after six months	Eco – friendly management practice for *Sitophilus oryzae*

PLANT PATHOLOGY

Action Plan 1: Documentation on diseases of small millets (Varagu, Tenai, Ragi & Kudiraivali)

Theme Leader	**Dr. G. Senthilraja, Asst.Professor (Pl.Path), RRS, Vriddhachalam**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Survey and documentation of diseases of small millets	Dr. G. Senthilraja, RRS, Vriddhachalam Dr. M. Paramasivan, DARS, Chettinad	Survey and document the occurrence of diseases in major small millets growing regions of Tamil Nadu Identification of the pathogens involved with their characterization	Geographical distribution of diseases of small millets Influence of epidemiological factors on the occurrence of diseases in small millets
	Dr. S. Kokilavani, ACRC, TNAU, Coimbatore	Correlation with local weather factors	

Action Plan 2: Documentation of seed borne pathogens of sorghum and maize

Theme Leader	**Dr. T. Anand, Asst. Professor (Pl. Path), Seed Centre, Coimbatore**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Screening for seed borne pathogens and their management	Dr. T. Anand Seed Centre, TNAU, CBE	Documentation of seed borne pathogens associated with sorghum and maize Developing management strategies	Seed borne nature of pathogens Suitable management strategies for seed borne pathogens

Action Plan 3. Biological control of *Fusarium* Post Flowering Stalk Rot

Theme Leader	**Dr. R. Radhajeyalakshmi - MRS, Vagarai**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Evaluation of antifungal properties of PGPRs from maize rhizosphere against PFSR of maize. *In vitro* and *in vivo* evaluation of PGPR strains for PFSR disease management in maize.	Dr. R. Radhajeyalakshmi, Maize Research Station, Vagarai	*In vitro* screening of PGPRs from maize rhizosphere against PFSR pathogen. Studying rhizosphere colonization and competitive saprophytic ability *In vivo* experiments with PGPRs on maize crop & their impact will be analyzed in terms of disease reduction, plant growth promotion and yield	Developing biological control methods for PFSR disease of maize using PGPRs with increased antifungal properties

Action Plan 4: Biological management of rust disease in pearl millet

Theme Leader	**Dr. I. Johnson, Asst. Prof. (Pl. Path.), Dept. of Millets, Coimbatore**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Sphaerellopsis paraphysata ▪ Molecular identity and pathogenicity of mycoparasite ▪ Standardization of media for higher growth Evaluation of existing antagonists	Dr. I. Johnson, Asst. Prof. (Pl. Path), Dept. of Millets, TNAU, CBE	Mycelia growth, sporulation PDI on 60th day after sowing	Effective mycoparasite for rust management Effective antagonist

1. *Pseudomonas fluorescens* Pf1 @ 0.2% 2. *Bacillus subtilis* EPCo 5 @ 0.2% 3. Pf1 + *B. subtilis* EPCo 5 each @ 0.2% 4. Control Foliar application on 30th and 45th day after sowing			will be selected for further studies

Action Plan 5: Management of leaf blight in barnyard millet

Theme Leader	**Dr. M .Paramasivan, Asst. Prof. (Pl. Path.), DARS, Chettinad**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
Biological control • ST(10g/kg)+FS of *Pseudomonas fluorescens* (Pf1) @ 10gm/lit • ST(10g/kg)+ FS of *B. subtilis* @ 10 gm/lit **Botanicals** (10%) • *Nerium oleander* • Neem cake extract **Chemicals** • Carbendazim + Mancozeb (0.2%), • Mancozeb (0.2%) • Copper oxychloride (0.25%) Foliar Spray on 30th and 45th DAS	Dr. M .Paramasivan, Asst. Prof. (Pl. Path.), DARS, chettinad	PDI on 30th and 45th days after sowing	Effective method of management of leaf blight

Action Plan 6: Development of Decision Support System for foliar diseases in maize

Theme Leader	**Dr. V. Sendhilvel, Asst. Prof. (Pl. Path.,) Dept. of Millets, Coimbatore**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
1. To design the spore trap (T- shaped sampling) to ensure the spore load of foliar diseases 2. To study the spore load of i. *Bipolaris maydis* ii. *Helminthosporium turcicium* 3. Correlation of spore load and occurrence of the disease 4. Development of decision support system (DSS) based on the output of for disease management	Dr. V. Sendhilvel, Dept. of Millets, TNAU, CBE Dr. S. Mathiazhagan, AC&RI, Eachangottai Dr. R. Radhajeyalakshmi, MRS, Vagarai	Observation to be recorded on Spore count Age of the crop PDI for TLB and MLB Weather parameters RH Rainfall Temperature Dew fall	Disease forewarning model development for effective disease management
	Dr. S. Kokilavani, ACRC, TNAU, Coimbatore	Correlation with local weather factors	

Action Plan 7: Development of forewarning model for finger millet blast disease

Theme Leader	**Dr. M.Rajesh, Asst. Professor (Pl. Path), CEM, Athiyandal**		
Action Plan	**Name of the scientist(s) and centre**	**Activity**	**Deliverables/ expected out come**
• Develop model for blast disease in correlation with weather factors • Yield loss assessment	Dr. M.Rajesh, CEM, Athiyandal	Incidence of leaf (30 DAS), neck (45 DAS) and finger blast (75-80 DAS)	Effective forewarning model for finger millet blast disease

• Correlation with weather factors • Revalidation of the forewarning model	Dr. S. Kokilavani, ACRC, TNAU, Coimbatore		

IV Closing Remarks & Way Forward

Vice- Chancellor

- **Biotic stress** screening should be carried out under **artificial conditions** and field screening alone will not be sufficient to identify resistant lines/cultivars.
- The **intervention of Physiologist and Microbiologist** is very much essential to know the role of microbes and enzymatic activities with regard to biotic stress tolerance as mostly millets are grown as rainfed crop.
- **Multitier concept** and organic model for millet and forage crops may be tried
- **Crop centric package of practices** has to be evolved for the pre release cultures and hybrids
- IMD warning may be provided to the farmers before sowing season

Director of Research

- Classic and molecular breeding approaches for evolving genotypes resistant to Fall Army Worm
- Research on Bt conferring resistance against FAW to be strengthened
- Improved fodder varieties and genotypes of genotypes may be popularized amongst TNAU Farms and Villages identified for DFI
- Farm mechanization for millet cultivation
- Efforts may be undertaken to import parasitoids to manage FAW

IV) PARTICIPANTS

Crop Improvement

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Crop Management

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