TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

42nd Oilseeds Scientists Meet
(3rd and 4th May, 2023)

Lead Centre
Regional Research Station
Vriddhachalam – 606 001

Directorate of Research
Tamil Nadu Agricultural University
Coimbatore - 641 003

PROCEEDINGS
42nd Oilseeds Scientists Meet
(3rd and 4th May, 2023)

The 42nd Oilseeds Scientists Meet was held on May 04, 2023 at Tamil Nadu Agricultural University, Coimbatore. Individual review of research projects, Action taken on OFT, Action plan was made by the concerned Technical Directors in the concurrent sessions arranged on 03.05.2023. During the concurrent sessions, the Director of Research, TNAU, Coimbatore interacted with the concerned scientists in each Directorate and offered critical remarks and suggestions.

On 04.05.2023, **Dr. V. Geethalakshmi**, Respected Vice Chancellor, TNAU, Coimbatore chaired the session and offered the opening remarks.

- The Vice Chancellor emphasised the need of increasing the area under production and productivity of TNAU released oilseed varieties in our state.
- Mapping of area of production of each of the oilseed crop for *Kharif* and *Rabi* season using Remote sensing technology may be initiated.
- The Vice Chancellor further suggested to identify suitable sesamum variety for Rice-Rice-Sesame cropping sequence for increasing the area under sesamum.
- Proper forewarning models for the pests and diseases of oilseed crops especially for Key pest/ disease shall be developed.
- Standardization of TNAU produced water soluble fertilizer requirement for oilseed crops may be done.
- Suitable ecofriendly management measures for emerging pests and diseases, development of resistant varieties and management technologies for changing climate may be given priority.
- Suitable alternate crop for oilseeds may be explored.

Dr. M. Raveendran, Director of Research, TNAU, Coimbatore welcomed the gathering and suggested to carry out impact analysis on the spread of TNAU released oilseed varieties through Geo mapping tool. Breeders should render more emphasis on the development of extra early varieties in groundnut with high oleic acid and imparting resistance against foliar diseases. Possibility of developing monostem sesame variety with herbicide resistance may be attempted utilizing the available vast germplasm.

A total of 49 University Research Projects, 9 Externally funded projects, 24 Action Plans and 14 AICRP projects were reviewed by the Vice Chancellor, TNAU, Coimbatore and Director of Research, TNAU, Coimbatore.

The Action Taken Reports on the proceedings of 41st Oilseeds Scientists' Meet 2022 and Action Plan for 2023-24 were presented by **Dr. R. Ravikesavan,** Director (CPBG), **Dr. S. P. Ramanathan,** Prof and Head, ACRC, **Dr. P. Balasubramaniam,** Director (NRM) and **Dr. V. Balasubramanian,** COE, CPPS (i/c). At the end, **Dr. K. Subrahmaniyan,** Director, TRRI, Aduthurai proposed vote of thanks.

The proceedings of the 42nd Oilseeds Scientists Meet are furnished below in the following headings:

I. CROP IMPROVEMENT

A. Entries for variety release proposal /OFT/ART/MLT
B. Action plan for 2023-24
C. Research projects and remarks

II. CROP MANAGEMENT

A. Technologies for adoption / OFT / information
B. Action plan for 2023-24
C. Research projects and remarks

NATURAL RESOURCE MANAGEMENT

A. Technologies for adoption / OFT / information
B. Action plan for 2023-24
C. Research projects and remarks

III. CROP PROTECTION

A. Technologies for adoption/OFT/information
B. Action plan for 2023-24
C. Research projects and remarks

IV. REMARKS

V. LIST OF PARTICIPANTS

I. CROP IMPROVEMENT

A. Entries for variety release proposal/ART/OFT/MLT (2023-24)

A1. Variety Release

Groundnut COG 0537

Parentage	CO 7 x ICGV 03042
Duration (in days)	105-110
Yield (kg/ha)	2969 kg/ha
Shelling outturn (%)	69.0
Oil content (%)	48-50
% Yield increase	17.1 and 28.6% superior over CO 7 (2536 Kg/ha) and VRI 8 (2308 Kg/ha) respectively.

COG 0537 is moderately resistant to early leaf spot (Grade: 2), Late leaf spot (Grade: 3) and rust diseases (Grade: 2).

A2. Sesame: OFT

Sesame VS 15014

Parentage	TMV 7 x Mutant 699
Duration (in days)	80-85
Seed Yield (kg/ha)	830 kg/ha
Seed color	Brown
Oil content (%)	48-50
% Yield increase	17.7 and 16.0% superior over VRI 3 (703 kg/ha) and TMV 7 (714 kg/ha) respectively.

VS 15014 is moderately resistant to phyllody (<20%) and dry root rot phyllody (<20%) diseases.

A3. Groundnut: ART
1. Crop: Groundnut

Season: *Kharif* 2023 and *Rabi* / Summer 2032-24 Spacing: 30 x 10 cm

S. No.	Entries/ Checks	Pedigree	Duration (Days)	Pod yield (kg/ha)	Special attributes
1.	VG 14019 (R)*	CTMG 7 x CS 19-1	105-110	2156	High yield
2.	TVG 17180 (R)*	ICGV 07240 x R 2001-2	105-110	2108	High yield
3.	VG 18089 (N)	ICGV 00348 x ISK-2013-1	90-95	2080	Early
4	COG 17007 (N)	TMV 13 X ICGV 06146	105-110	2266	High yield
5	CTDG 1501 (N)		110-115	2343	High yield
Checks: VRI 9, VRI 10, BSR 2, GG 7					

Locations: 96

Season	*Kharif* 2023 and *Rabi* /Summer 2023-24
Districts	Thiruvallur, Kancheepuram, Villupuram, Vellore, Thiruvannamalai, Cuddalore, Salem, Namakkal, Erode, Coimbatore, Thiruchirappalli, Perambalur, Karur, Pudukkottai, Tanjore, Madurai, Theni, Virudhunagar, Sivagangai, Thirunelveli (80 Trials – Four trials in each Dt.)
KVK	KVK, Sandiyur, KVK, Vridhachalam, KVK, Tinidvanam, KVK, Erode, KVK, Paparapatti, KVK, Perambalur, KVK, Vamban, KVK, Karur (16 Trials –2 trials in each KVK)

2. Crop: Castor

S. No.	Entries/ Checks	Pedigree	Duration (Days)	Seed yield (kg/ha)	Special attributes
1.	YRCH 19014 (N)	DPC 9 x JI 220	2425	180	Early, and wilt resistant
2.	YRCH 19016 (N)	DPC 9 x SKI 215	2340	180	Early, wilt resistant and Basal branching
Checks: YRCH 1, YRCH 2, DCH 519 & ICH 66					

Locations: 60

Season	*Kharif* 2023
Districts	Salem, Namakkal, Karur, Erode, Dharmapuri, Tiruppur, Dindugal, Thiruvannamalai, Perambalur and Tirunelveli (50 Trials – five trials in each Dt.)
KVK	Vamban, Virudhachalam, Tindivanam, Santhiyur and Paparapatti (10 trials - 2 trials in each KVK

A4. MULTI LOCATION TRIAL (MLT)

1. Groundnut: Habit Group: SPANISH BUNCH

Season: *Kharif* 2023 &*Rabi* / Summer 2023-24 Replication: Three
Spacing: 30 cm x 10 cm Plot size: 4.0 x 3.0 m^2

Features of the proposed culture

S. No.	Culture	Parentage	Duration (days)	Seed yield (kg/ha)
1.	VG 20-001 (R)	VRI 8 x GIRINAR 4	105-110	3840
2.	VG 20-002 (R)	VRI 3 x GIRINAR 4	105-110	3888
3.	VG 19815 (N)	VRI 2 x VG 13113	105-110	3225
4.	VG 19817 (N)	VRI 6 x VG 13127	105-110	3342
5.	COG 17006 (N)	TMV 13 x ICGV 06146	105-110	3287
Checks: VRI 9, VRI 10, GG7, BSR 2, TMV 14				
Testing centres (11): Vridhachalam, Tindivanam, Coimbatore, Bhavanisagar, Vazhavachanur, Aliyarnagar, Sandhiyur, Madurai, Killikulam, Chettinad, Pattukkottai and Paiyur				

*The seed materials sent for *Kharif* season should be used for Rabi season sowing. Seeds will not be sent separately for *Rabi* season sowing.

Observations to be recorded

(1) Days to maturity. (2) Pod yield (kg/plot) (replication-wise), (3) Kernel yield (kg/plot) (replication-wise), (4) Shelling % (5) Dry pod yield (kg/ha) and (6) Kernel yield (kg/ha).

Note: Screening for the pests and diseases will be carried out by RRS, Vriddhachalam, Dept. of Oilseeds, TNAU, Coimbatore and CRS, Aliyarnagar.

Name of the centre	Pests	Diseases
RRS, Vriddhachalam	√	√
Dept. of Oilseeds, TNAU, Coimbatore	-	√
CRS, Aliyarnagar	-	√

2. Sesame: Multilocation Trial (MLT)

Season: *Rabi* 2023-24and Summer 2024 Replication: Three
Spacing: 30 cm x 30 cm Plot size: 4.0 x 3.0 m^2

Features of the proposed culture

S. No.	Culture	Parentage	Duration (days)	Seed yield (kg/ha)	Special features
1.	VS 20-008 (R)	TMV 4 x TKG 506	85-90	927	Brown seed
2.	VS 20-040 (R)	TMV 7 x AT 374	85-90	914	Brown seed
3.	VS 19-054 (R)	TMV 7 x E 8	85-90	930	White seed
4.	VS 21-012 (R)	CO 1 x AT 377	80-85	914	Black seed
5.	VS 21-023 (R)	CO 1 x RMT 485	80-85	937	Black seed
6.	VS 21-060 (N)	Paiyur 1 x AT 348	80-85	950	Black seed
Checks: TMV 7, VRI 3 and VRI 4					
Locations (9): Vridhachalam, Tindivanam, Coimbatore, Srivilliputhur, Killikulam, Madurai, Bhavanisagar, Vazhavachanur, Pattukkottai and Kumulur (*Rabi* 2023-24 and Summer 2024)					

Observations to be recorded

(1) Days to maturity, (2) Number of branches per plant, (3) Number of capsules per plant, (4) Seed yield (kg/plot) (replication-wise) and (5) Seed yield (kg/ha)

Note: Screening for the pests and diseases will be carried out by RRS, Vriddhachalam

Name of the centre	Pests	Diseases
RRS, Vriddhachalam	Leaf hoppers, Shoot and capsule borer	Phyllody, Root rot, Powdery mildew and *Cercospora* lead spot

3. Sunflower: Multilocation Trial (MLT)

Season: *Kharif* 2023 &*Rabi* / Summer 2023-24 Replication: Four
Spacing: 60 x 30 cm Plot size: 4.0 x 3.0 m^2

Features of the proposed cultures

S. No.	Culture	Parentage	Duration (days)	Seed yield (kg/ha)
1.	CSFH 19004 (R)	COSF 6A x CSFI 1546	90-95	2479
2.	CSFH 19096 (R)	COSF 12A x CSFI 1874	85-90	2295
3.	CSFH 19087 (R)	COSF 6A x CSFI 1873	85-90	2229
Checks: COH 3, COH 4, DRSH 1 and Gangakaveri 2002				
Testing centres (8): Coimbatore, Bhavanisagar, Vridhachalam, Killikulam, Veppanthattai (*Rabi*), Tindivanam (*Rabi*) and Kovilpatti (*Rabi*)				

Observations to be recorded

(1) Days to 50% flowering, (2) Head Diameter (3) Seed yield (kg/plot) (replication-wise) and (4) Seed yield (kg/ha).

Note: Screening for the following pests and diseases will be carried out by Dept. of Oilseeds, Coimbatore

Name of the centre	Pests	Diseases
Dept. of Oilseeds, Coimbatore	Leaf Hopper, Head borer	Necrosis, Powdery mildew and Alternaria

4. Castor: Multilocation Trial (MLT)

Season: *Rabi* 2023-24 Replication: Four
Spacing: 120 cm x 120 cm Plot size: 4.8 x6.0 m^2

Features of the proposed cultures

S. No.	Hybrids	Parentage	Seed yield (kg/ha)	Duration (Days)	Special features
1	YRCH 20019 (R)	Jp 65-1 x RG 43	1924	160	Early, and wilt resistant
Checks: YRCH 1, YRCH 2, DCH 519 & ICH 66					
Testing centres (6): Yethapur, Vridhachalam, Tindivanam, Kovilpatti, Killikulam, Santhiyur					

Observations to be recorded

(1) Days to 50% flowering, (2) Days to maturity, (3) Seed yield (kg/plot) (replication-wise) and (5) Seed yield (kg/ha)

Note: Screening for the following pests and diseases will be carried out by TCRS, Yethapur

Name of the centre	Pests	Diseases
TCRS, Yethapur	Semilooper, Capsule Borer, Leaf hopper, White fly and Flower thrips	Botrytis Grey Mold & Wilt

SEED REQUIREMENT FOR CONDUCTING ART / MLT 2023-24

S. No.	Name of the Entry / Check	Quantity of seed required (kg)		Centre responsible for supply
		Kharif	*Rabi*/ summer	
GROUNDNUT				
1.	VG 14019 (R)	150	150	Vriddhachalam
2.	TVG 17180 (R)	150	150	Tindivanam
3.	VG 18089 (N)	150	150	Vriddhachalam
4.	COG 17007 (N)	150	150	Coimbatore
5.	VRI 9 (Ch)	150	150	Vriddhachalam
6.	VRI 10 (Ch)	150	150	Vriddhachalam
7.	BSR 2 (Ch)	150	150	Bhavanisagar
8.	GG 7 (Ch)	150	150	Vriddhachalam
9.	VG 20-001 (R)	12	-	Vriddhachalam
10.	VG 20-002 (R)	12	-	Vriddhachalam
11.	VG 19815 (N)	12	-	Vriddhachalam
12.	VG 19817 (N)	12	-	Vriddhachalam
13.	COG 17006 (N)	12	-	Coimbatore
14.	VRI 9 (Ch)	12	-	Vriddhachalam
15.	VRI 10 (Ch)	12	-	Vriddhachalam
16.	GG7 (Ch)	12	-	Vriddhachalam
17.	BSR 2 (Ch)	12	-	Bhavanisagar
18.	TMV 14 (Ch)	12	-	Tindivanam
SESAME				
1.	VS 20-008 (R)	1.0	1.0	Vriddhachalam
2.	VS 20-040 (R)	1.0	1.0	Vriddhachalam
3.	VS 19-054 (R)	1.0	1.0	Vriddhachalam
4.	VS 21-012 (R)	1.0	1.0	Vriddhachalam
5.	VS 21-023 (R)	1.0	1.0	Vriddhachalam
6.	VS 21-060 (N)	1.0	1.0	Vriddhachalam
7.	TMV 7 (Ch)	1.0	1.0	Tindivanam
8.	VRI 3 (Ch)	1.0	1.0	Vriddhachalam
9.	VRI 4 (Ch)	1.0	1.0	Vriddhachalam
SUNFLOWER				
1.	CSFH 19004 (R)	1.0	1.0	Coimbatore
2.	CSFH 19096 (R)	1.0	1.0	Coimbatore
3.	CSFH 19087 (R)	1.0	1.0	Coimbatore
4.	COH 3 (Ch)	1.0	1.0	Coimbatore
5.	COH 4 (Ch)	1.0	1.0	Coimbatore
6.	DRSH 1 (Ch)	1.0	1.0	Coimbatore
7.	Gangakaveri 2002	1.0	1.0	Coimbatore
CASTOR				
1.	YRCH 19014 (N)	10	-	Yethapur
2.	YRCH 19016 (N)	10	-	Yethapur
3.	YRCH 2019	10	-	Yethapur
4.	YRCH 1	10	-	Yethapur
5.	YRCH 2	10	-	Yethapur
6.	DCH 519	10	-	Yethapur
7.	ICH 66	10	-	Yethapur

Important Dates in conduct of MLT and ART

Activities	Season	Last date for receipts	Date of Despatch
Seed material of the proposed ART entries	*Kharif*	15.06.2023	20.06.2023
	Rabi	15.08.2023	05.09.2023
	Summer	30.12.2023	10.02.2024
Seed material of the proposed MLT entries	*Kharif*	15.06.2023	20.06.2023
	Rabi	15.08.2023	05.09.2023
	Summer	30.12.2023	10.02.2024
Sowing report	*Kharif*	30.07.2023	-
	Rabi	30.10.2023	
	Summer	31.03.2024	
Visit of MLT/monitoring teams	*Kharif*	Sep. 2023	-
	Rabi	Dec. 2023	
	Summer	May. 2024	
Date for receiving the trial results at Vriddhachalam for compilation	*Kharif*	15.12.2023	-
	Rabi	28.02.2023	
	Summer	30.06.2024	

Monitoring team to visit MLT 2023-24

Scientist	Crop	Season	Centres
Dr. K. Bharathi Kumar, Assoc. Prof. (PBG), RRS, VRI Dr. A. Mahalingam, Asst. Prof. (PBG), RRS, VRI Dr. M. Paramasivan, Assoc. Prof. (Pl Path.), RRS, VRI Dr. P. Indiragandhi, Assoc. Prof. (Ag. Ento.), RRS, VRI	Groundnut Sesame Sunflower Castor	*Kharif* 2023 and *Rabi* / Summer 2023-24	Coimbatore Tindivanam Paiyur Veppanthattai
Dr. T. Kalaimagal, Prof. (PBG) and Head, TNAU, CBE Dr. R. Sasikala, Asst. Prof. (PBG), CBE Dr. S. Harish, Assoc. Prof. (Pl. Path.), CBE Dr. P. Indiragandhi, Assoc. Prof. (Ag. Ento.), RRS, VRI	Groundnut Sesame Sunflower Castor	*Kharif* 2023 and Rabi / Summer 2023-24	Vriddhachalam Bhavanisagar Aliyarnagar Yethapur
Dr. S.R. Venkatachalam, Professor, TCRS, Yethapur Dr. R. Kanchanarani, Asst. Prof. (PBG), ORS, Tindivanam Dr. T.K.S. Latha, Assoc. Prof. (Path.), RRS, VRI	Groundnut Sesame Sunflower Castor	*Kharif* 2023 and *Rabi* / Summer 2023-24	Sandhiyur Vazhavachanur Kumulur Chettinad
Dr. P. Arutchenthil, Professor (PBG), TCRS, Yethapur Dr. M. Paramasivan, Assoc. Prof. (Pl. Path.), RRS, VRI Dr. B. Geetha, Professor (Ag. Ento.), RRS, VRI	Groundnut Sesame Sunflower Castor	*Kharif* 2023 and *Rabi* / Summer 2023-24	Killikulam Srivilliputhur Kovilpatti Madurai

B. Research Projects on Oilseeds

Centres	University Sub-Projects	AICRP projects	Externally funded projects	Total
GROUNDNUT				
Vriddhachalam	5	1	1	7
Tindivanam	2	1	-	3
Coimbatore	4	-	1	5
Kudimiyanmalai	1	-	-	1
Bhavanisagar	1	-	-	1
Vaigaidam	1	-	-	1
Vazhavachanur	1	-	-	1
Pattukottai	1	-	-	1
Sub Total	**16**	**2**	**2**	**20**
SESAME				
Vriddhachalam	2	1	2	5
Srivilliputhur	1	-	-	1
Kumulur	1	-	-	1
Vazhavachanur	1	-	-	1
Chettinad	1	-	-	1
Sub Total	**6**	**1**	**2**	**9**
SUNFLOWER				
Coimbatore	2	1	3	6
Sub Total	**2**	**1**	**3**	**6**
CASTOR				
Yethapur	3	1	-	4
Sub Total	**3**	**1**	**-**	**4**
Grand Total	**27**	**5**	**7**	**39**

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

LIST OF ONGOING RESEARCH PROJECTS AND ITS REMARKS

S. No.	Project No. and Title	Project leaders	Duration	Remarks
A. UNIVERSITY RESEARCH PROJECTS (URP)				
Groundnut				
1.	**CPBG/VRI/PBG/Oil/2021/002** Development of high Oleic content groundnut breeding lines	Dr. M. Pandiyan Professor (PBG)	July 2021 to June 2024	Change of project leader should be sent for approval. Project may be continued.
2.	**CPBG/VRI/PBG/Oil/2021/001** Development of high yielding drought and salinity tolerant groundnut breeding lines	Dr. M. Pandiyan, Professor (PB&G)	July 2021 to June 2024	Change of project leader should be sent for approval. Segregating populations

				can be shared with Tindivanam and Coimbatore for evaluation of drought tolerance
3.	**CPBG / VRI / OIL / 2023 / 001** Maintenance, evaluation of genetic resources and interspecific hybridization in groundnut (*Arachis hypogeaa* L.)	Dr. A. Mahalingam Assistant Professor (PB&G)	February 2023 to January 2028	Project may be continued.
4.	**CPBG / VRI / OIL / 2023 / 002** Evolution of high yielding Spanish / Virginia bunch cultivars in groundnut	Dr. A. Mahalingam Assistant Professor (PB&G) **CO-PI:** Dr. K. Bharathi Kumar Associate Professor (PB&G)	February 2023 to January 2028	Number of cross combinations synthesized may be restricted and there should not be any repetition between AICRP centers. Project may be continued.
5	**CPBG / VRI / OIL / 2023 / 003** Nucleus and breeder seed production in Groundnut varieties	Dr. A. Mahalingam AP (PB&G) **CO-PI:** Dr. K. Bharathi Kumar Assoc. Prof. (PB&G)	February 2023 to January 2028	The target should be achieved without any shortfall
6	**CPBG/CBE/PBG/GNT/2020/001** Evolving Short duration Spanish bunch groundnut varieties for groundnut growing tracts of Tamil Nadu	Dr. T. Kalaimagal Professor and Head	June 2020 to May 2023	Completion Report may be submitted and new project may be proposed in the same line.
7	**CPBG/CBE/OIL/OIL/2023/001** Maintenance breeding in popular groundnut varieties of Tamil Nadu	Dr. T. Kalaimagal, Prof. (PB&G) and Head Dr. M. Umadevi, AP (PB&G)	July 2022 to June 2027	The target should be achieved without any shortfall
8	**CPBG/CBE/OIL/OIL/2023/002** Development of high yield and drought tolerant genotypes in groundnut	Dr. M. Umadevi, AP (PB&G) Dr. K. Vanitha AP (Crop Physiology)	July 2022 to June 2027	The project may be continued. The ROS available may be well utilised
9	**CPBG/TVM/PBG/OIL/2018/001** Maintenance Breeding and Breeder Seed Production of groundnut	Dr. R. Kanchanarani, AP (PB&G)	September 2018 to August 2021	The target should be achieved

	Sesame, Castor and Pulses varieties released from TNAU			without any shortfall
10	**CPBG/TVM/PBG/GNT/2018/001:** Evolution of bunch groundnut varieties tolerant to early-stage drought situations	Dr. R. Kanchanarani, AP (PB&G)	June 2018 to May 2023	The project may be closed and new project may be proposed
11	**CPBG/ VAZ/ PBG/ OIL/ 2021/ 001** Evolution of high yielding drought tolerant groundnut genotypes	Dr. A. Mothilal, Professor (PBG)	September 2021 to August 2026	The project leader will present the project findings to the DCPBG before the crop season
12	**CPBG/CBE/PBG/GNT/2020/002** Development of high oleic Spanish groundnut variety	Dr. N.Manivannan, Professor (PBG)	Nov 2020 to Oct 2025	The project may be continued
13	**CPBG/VGD/PBG/BSP/2020/001** Maintenance Breeding in Groundnut and Pulses	Dr. C. Parameswari Associate Professor (PBG)	Oct. 2020 to Sept. 2025	The target should be achieved without any shortfall
14	**CPBG / KDM / OIL / 2022 / 001** Breeder seed production in Groundnut and Pulses	Dr. K. Thiruvengadam Associate Professor (PBG)	Nov 2021 to Oct 2024	The target should be achieved without any shortfall
15	**CPBG/BSR/PBG/2020/001** Maintenance breeding in oilseed crop varieties released by TNAU	Dr. S. Utharasu Asst. Professor (PB&G)	September 2020 to August 2025	The target should be achieved without any shortfall
16	**CPBG/PAT/PUL/2023/001** Breeder seed production in Pulses and Groundnut	Dr. S. Chitra Associate Professor (PBG)	November 2022 to October 2025	The target should be achieved without any shortfall
Sesame				
17	**CPBG/VRI/PBG/SES/2019/001** Evolution of high yielding sesame varieties with resistance to *Macrophomina* root rot	Dr. K. Bharathi Kumar Associate Professor (PB&G)	September 2018 to August 2023	May be closed and while proposing new project is the same line a Plant Pathologist may be included as Co PI
18	**CPBG / VRI / OIL / 2023 / 003**	Dr. K. Bharathi Kumar Associate Professor (PB&G)	February 2023 to	The target should be achieved

	Production of genetically pure nucleus and breeder seed of sesame varieties	**CO-PI:** Dr. A. Mahalingam Assistant Professor (PB&G)	January 2028	without any shortfall
19	**CPBG/KUM/PBG/SES/2019/001**Development of Sesame (*Sesamum indicum* (L.) varieties suitable for summer irrigated conditions	Dr. K. Thiyagu, AP (PBG) Dr. M. Dhandapani, AP (PBG)	February 2019 to June 2022	The materials generated may be shared with other centres.
20	**CPBG/SVR/OIL/2022/001** Evaluation of segregating materials and advance cultures of sesame genotypes suitable for southern districts of Tamil Nadu	Dr. G. Anand, Associate Professor (PB&G)	Feb 2022 to Jan 2024	The project may be continued
21	**CPBG/ VAZ/ OIL/ 2023/ 001** Evolution of high yielding sesame varieties suitable for North East Zone of Tamil Nadu	Dr. S. Ganapathy Associate Professor (PB&G)	October 2022 to September 2027	The project may be continued
22	**CPBG/CHE/OIL/2023/001** Evolving phyllody resistant sesame variety through induced mutilation	Dr.M.Jayaramachandran Associate Professor (PB&G) Dr.K.Manonmani Associate Professor (Pl.Pathology) Dr.J.Ram Kumar Assistant Professor (Agrl Entomology)	October 2022 to September 2024	The project may be continued
Sunflower				
23	**CPBG/CBE/PBG/OIL/2021/001** Evolution of high yielding sunflower hybrids	Dr. R. Sasikala, Assistant Professor (Plant Breeding)	January 2021 to December 2025	The project may be continued.
24	**CPBG/CBE/PBG/OIL/2022/001** Maintenance and Evaluation of germplasm in Sunflower	Dr. R. Sasikala, Assistant Professor (Plant Breeding)	January 2022 to December 2024	The project may be continued.
Castor				
25	**CPBG/ YTP/ PBG/ CAS/ 2020/ 001** Genetic diversification for development of Stable wilt resistant pistillate lines in castor	Dr. S. R. Venkatachalam, Professor (PB&G)	November 2020 to October 2025	The project may be continued.
26	**CPBG/ YTP/ PBG/ CAS/ 2021/ New:** Evolution of Monoecious variety / male line in castor for earliness and wilt disease resistance	Dr. P. Arutchenthil Professor (PB&G), Dr. V. Ravichandran Assistant Professor (Pl. Path)	September 2021 to August 2024	The project may be continued.
27	**CPBG/YTP/OIL/CAS/2022/001** Maintenance Breeding in Castor	Dr. P. Arutchenthil Professor (PB&G)	September 2021 to August 2024	The project may be continued

B. AICRP projects				
28	**AICRP/PBG/VRI/GNT/021** All India Evaluation of advanced breeding lines belonging to Spanish / Virginia bunch group through co-ordinated experiments.	Dr. A. Mahalingam Assistant Professor (PB&G) Dr. M. Pandiyan Professor (PB&G)	Continuous	The project may be continued
29	**AICRP/PBG/TVM/GNT/019** AICRP – Oilseeds Groundnut ORS, Tindivanam	Dr. R. Kanchanarani, Assistant Professor (PB&G)	Continuous	The project may be continued
30	**AICRP/PBG/VRI/SES/021** All India Coordinated Research Project on Sesame	Dr. K. Bharathi Kumar Associate Professor (PB&G) Dr. A. Mahalingam Assistant Professor (PB&G)	Continuous	The project may be continued
31	**AICRP/PBG/CBE/SUN/020** AICRP on Oilseeds (Sunflower)	Dr. R. Sasikala, Asst. Professor (PBG	Continuous	The project may be continued
32	**AICRP/PBG/YPR/CAS/022** All India Coordinated Research Project on castor – Breeding (D.32.C.I)	**Senior Breeder:** Dr. S.R. Venkatachalam Professor (PB&G). **Junior Breeder:** Dr. P. Arutchenthil Professor (PBG) Tapioca and Castor Research Station, Yethapur	Continuous	The project may be continued
C. EXTERNALLY FUNDED PROJECTS				
33	**DST/CPBG/CBE/PBG/2021/R001** Development of high oleic Spanish bunch groundnut variety through marker assisted backcross	Dr. N. Manivannan, Professor (PBG) **CO – PI** Dr. A. Mothilal, Professor (PBG)	30.12.2020 to 29.12.2023	The project may be continued
34	**Establishment of Centre of Excellence in Groundnut** (DR/P2/NADP / Groundnut /RRS, VRI / ASO / 2020 Dt. 07.10.2020)	Dr. K. Subrahmaniyan Director, TRRI, Aduthurai **CO-PIs** Dr. A. Mahalingam, Assistant Professor (PB&G)	2020-2023	The completion report to be submitted
35	**DBT – NBPGR / CPBG / VRI / OIL / 2020 / D003** Mainstreaming sesame germplasm for productivity enhancement and sustainability through genomics assisted core development and trait discovery	Dr. A. Mahalingam, Assistant Prof. (PB&G) Dr. G. Senthilraja, Assistant Prof. (Pathology)	01.04.2020 to 31.03.2025	The project may be continued
36	**DST – SERB / ADT / VRD / PBG / 2021 / R001** Marker Assisted backcross breeding for the improvement of dry root rot disease resistance in the popular sesame	Dr. A. Mahalingam, Assistant Prof. (PB&G) **Co-PI:** 1. Dr. N. Manivannan Professor (PBG)	December 2021 to December 2024	The project may be continued.

	varieties TMV 3 and TKG 22" (E28AGT)	CPBG, TNAU, Coimbatore 2. Dr. G. Senthilraja, Assistant Prof. (Pathology)		
37	**DST SERB/CPBG/OIL/2021/ R001** Redesigning of healthy fatty acid profile in sunflower by developing high oleic inbreds through MABC approach (E28AGQ)	**PI:** Dr. R. Sasikala Assistant Professor (Plant Breeding) **Co-PI:** 1. Dr. N. Manivannan (Mentor) Professor (PBG) CEMB, CPBG, TNAU, Coimbatore 2. Dr. M. Raveendran Director of Research, TNAU, Coimbatore	December 2021 to December 2024	The project may be continued.
38	**ICAR-DAC/CPBG/CBE/OIL/ 2022/ R001** Revival of Sunflower cultivation	**PIs:** Dr. R. Sasikala Assistant Professor (Plant Breeding), Dr. T. Kalaimagal, Professor and Head **CO-PIs:** Dr. S. Harish, Assoc. Prof. (Pathology) Dr. M. Senthivelu Assoc. Prof. (Agronomy)	-	The project may be continued.
39	**BE/SSP/CPBG/OIL/CBE/2023/ R001** Evaluation of newly developed sunflower hybrids suitable for Tamil Nadu	Dr. R. Sasikala AP (PBG), Dr. S.R. Venkatachalam Professor (PBG),	-	The project may be continued.

D. Action Plan (2023 – 2026)

The Action plan will be continued for the second year with identified scientists towards achieving the deliverables in Crop Improvement.

Theme No 1	**Development of pre-breeding lines of groundnut**			
Theme Leader	**Dr. A. Mahalingam, Assistant Professor (PBG), RRS, Vriddhachalam**			
Name of the scientists and centre	**2023-24**	**2024-25**	**2025-26**	**Deliverables/expected out come**
Vriddhachalam Dr. A. Mahalingam Dr. K. Bharathi Kumar	Hybridization VRI 2, VRI 6, VRI 9, VRI 10 x *Arachis spp*.	Hybridization VRI 2, VRI 6, VRI 9, VRI 10 x *Arachis spp*.	Hybridization VRI 2, VRI 6, VRI 9, VRI 10 x *Arachis spp*.	Development of groundnut genetic stocks
	Evaluation of segregating	Evaluation of segregating	Evaluation of segregating	

	populations *viz*., F_1, F_2, F_3, F_4, F_5, F_6 and F_7	populations *viz*., F_1, F_2, F_3, F_4, F_5, F_6 and F_7	populations *viz*., F_1, F_2, F_3, F_4, F_5, F_6 and F_7	
Theme No. 2	**Development of High Oleic groundnut breeding lines**			
Theme Leader	**Dr. N, Manivannan, Professor (PBG), CEMB, CPBG, Coimbatore**			
Name of the scientists and centre	**2023-24**	**2024-25**	**2025-26**	**Deliverables/expected out come**
Coimbatore Dr. N. Manivannan **Vriddhachalam** Dr. A. Mahalingam	Evaluation of BC_3F_1 (CBE)	Evaluation of high Oleic breeding lines for yield performance under PRYT at Vriddhachalam	Nomination and evaluation of high yielding, high Oleic breeding lines under PYT	Identification high yielding, high Oleic groundnut breeding lines
	Evaluation and identification of BC_3F_2 progenies with High Oleic content	Evaluation of high Oleic breeding lines for yield performance under PRYT at Vriddhachalam	Evaluation of high yielding, high Oleic breeding lines under PYT	

Theme No. 3	**Evolution of high yielding black seeded sesame variety to replace TMV 3**			
Theme Leader	**Dr. K. Bharathi Kumar, Associate Professor (PBG), RRS, Vriddhachalam**			
Name of the scientists and centre	**2022-23**	**2023-24**	**2024-25**	**Deliverables/expected out come**
Vriddhachalam Dr. K. Bharathi Kumar Dr. A. Mahalingam, **Coimbatore** Dr. M. Umadevi **Tindivanam** Dr. R. Kanchanarani **Bhavanisagar** Dr. S. Utharasu **Srivilliputhur** Dr. G. Anand **Vazhavachanur** Dr. S. Ganapathy **IOA, Kumulur** Dr. K. Thiyagu	MLT – I (7 centres: VRI, TVM, CBE, BSR, VVNR, SVPR, TRY-KUM) (June - July)	OFT / ART – I (June - July)	Large scale OFT / Seed multiplication	Release of black seeded sesame variety
	MLT – II (7 centres: VRI, TVM, CBE, BSR, VVNR, SVPR, TRY-KUM) (Dec -Jan)	OFT / ART – II (Dec - Jan)	Submission of variety release proposal	

Multilocation Trial – Black seeded Sesame

S. No	Entries	Pedigree	Duration (Days)	Seed yield (kg/ha)	Special attributes
1.	VS 20-041	VRI 2 x GT 10	80-85	889	Black seed

2.	VS 20-053	VRI 2 x EC 346393	75-80	856	Black seed
3.	VS 21-012	CO 1 x AT 377	80-85	914	Black seed
4.	VS 21-023	CO 1 x RMT 485	80-85	937	Black seed
Check: TMV 3					

Theme No. 4	**Evolution of high yielding early duration sesame variety suitable for rice follow ecosystem**			
Theme Leader	**Dr. K. Bharathi Kumar, Assoc. Prof. (PBG), RRS, Vriddhachalam**			
Name of the scientists and centre	**2022-23**	**2023-24**	**2024-25**	**Deliverables/ expected out come**
Vriddhachalam **Dr. K. Bharathi Kumar** Dr. A. Mahalingam **Aduthurai** Dr. M. Dhandapani **IOA- Kumulur** Dr. K. Thiyagu **Sirugamani** Dr. M. Sakila **Killikulam** Dr. S. Saravanan **Tirur** Dr. S. Banumathi **KVK, Needamangalam** Dr. V. Radha Krishnan	Seed multiplication of VS 20-001, VS 20-002, VS 21-012, VS 21-014, VS 21-078 and VRI 1 (VRI)	Seed multiplication of promising entry	Seed multiplication	Release of high yielding early duration sesame variety suitable for rice follow ecosystem
	MLT – (6 centres: ADT, NDM, IOA-TRY, SGM, TKM, KKM) under rice follow system (Dec -Jan)	OFT / ART (Dec -Jan) under rice follow system at Thanjavur, Thiruvarur and Nagapattinam districts	Submission of variety release proposal	

Multilocation Trial – Rice follow Sesame

S. No.	Entries	Pedigree	Duration (Days)	Seed yield (kg/ha)	Special attributes
1.	VS 20-001	CO 1 x AT 324	65-70	889	Early, Black seed
2.	VS 20-002	CO 1 x AT 324	65-70	856	Early, Brown seed
3.	VS 21-012	CO 1 x AT 377	70-75	914	Early, Black seed
4.	VS 21-078	Paiyur 1 x AT 324	70-75	937	Early, Black seed
Check: VRI Sv 1					

Theme No. 5	**Development of maintainer line in sunflower with high oleic content using MAS**				
Theme Leader	**Dr. R. Sasikala, Asst. Professor (PBG), Dept. of Oilseeds, Coimbatore**				
Name of the scientists and centre	**2019-20**	**2020-21 and 2021-22**	**2022-23**	**2023-24**	**Deliverables / expected out come**
Coimbatore Dr. R. Sasikala,	Hybridization of promising maintainer with	Generation advancement of F2, F3 and	Evaluation of F5	Evaluation of selected F7 (COSF6BxHO)	Identification high oleic maintainer lines

Asst. Professor (PBG)	high oleic donor COSF6B x HO 5-29	F4. Continued foreground selection for high oleic loci and selected plants were forwarded	(COSF 6Bx HO) lines	lines for high oleic content and crossing with promising cms lines	
	Evaluation of F_1 and true hybrids were identified		Evaluation of F6 (COSF 6B x HO) lines	Evaluation of high oleic F1 hybrids for combining ability test of maintainer inbreds	

Theme No. 6	**Development of Castor hybrids / varieties suitable for synchronized maturity / mechanical harvesting**			
Theme Leader	**Dr. S.R. Venkatachalam, Professor (PB&G), TCRS, Yethapur**			
Name of the scientists and centre	**2022-23**	**2023-24**	**2024-25**	**Deliverables / expected out come**
Yethapur Dr. S.R. Venkatachalam, Professor (PB&G) and Head Dr. P. Arutchenthil Professor (PB&G)	1. Identification of castor genotypes for monospike and synchronised maturity. 2. Hybridization with monoecious lines JM6, RG 392 to develop pistillate x pistillate, pistillate x monoecious, monoecious x monoecious hybrids	Evaluation of F1s and backcross with JM 6 and RG 392	Evaluation of promising hybrids and segregating generations	Identification of hybrids / varieties suitable for synchronized maturity / mechanical harvesting

Theme No. 7	**Exploration of new Oilseed crops for Tamil Nadu**			
Theme Leader	**Mustard & Safflower: Dr. R. Ravikesavan, DCPBG, Dr. T. Kalaimagal, Professor (PB&G) and Head** **Niger: Dr. K. Bharathi Kumar, Assoc. Prof. (PB&G), RRS, Vriddhachalam**			
Name of the scientists and centre	**2023-24**	**2024-25**	**2025-26**	**Deliverables / expected out come**
Mustard Coimbatore Dr. T. Kalaimagal Bhavanisagar Dr. S. Utharasu Vaigaidam Dr. C. Parameswari Paiyur	Evaluation of high yielding varieties *viz*., Pusa Mustard 25, Pusa Mustard 28, Pusa Mustard 30, Pusa Mustard 31, Pusa Mustard32			Exploring the feasibility of cultivation of mustard, Niger and Safflower in Tamil Nadu.

Dr. K.Geetha	and identification of suitable varieties			
Niger Vriddhachalam Dr. K. Bharathi Kumar Vazhavachanur Dr. S. Ganapathy Paiyur Dr. K. Geetha **Safflower** Coimbatore Dr. T. Kalaimagal Kovilpatti Dr. N. Ananthi Vazhavachanur Dr. S. Ganapathy Tindivanam Dr. R. Kanchanarani Chettinad Dr.M.Jayaramachandran	Collection, evaluation and identification of high yielding Niger & Safflower varieties	Collection, evaluation and identification of high yielding Niger & Safflower varieties	Collection, evaluation and identification of high yielding Niger & Safflower varieties	

Theme No 8	**Development of high yielding and high oil sunflower variety better than CO(SFV) 5**			
Theme Leader	**Dr. R. Sasikala, Assistant Professor (PB&G)**			
Name of the scientists and centre	**2023-24**	**2024-25**	**2025-26**	**Deliverables / expected out come**
Coimbatore Dr. R. Sasikala	Evaluation of F5 generation (selected lines from COSF 15B x IR6 cross) for desirable agronomic traits and also new crosses will be made (COSF6B x GMU764)	Generation advancement of F6 (COSF15B x IR 6) and F1s and F2 generation (COSF6B x GMU 764)	Evaluation and identification of promising entries with high yield and oil content from following crosses COSF15B x IR 6 COSF6B x GMU764	Identification of superior varieties with high yield and oil content better than CO (SFV) 5

Seed Science and Technology

S. No.	Project No. & Title	Project Leader	Remarks
1.	SEC/BSR/SST/2020/001 Seed yield maximization studies in castor hybrid YRCH 2	Dr. V. Vakeswaran Assoc. Prof. (SST) ARS, Bhavanisagar	May be closed and completion report may be submitted.
2.	SEC/TMV/SST/GNT/2020/001 Studies on prevention of *in situ* germination in groundnut var. VRI 8	Dr. K. Parameswari Assoc. Prof. (SST) AC&RI, Kudumiyanmalai	The project may be closed and completion report may be submitted.

S. No.	Project No. & Title	Project Leader	Remarks
3.	SEC/CBE/SST/HOR/2021/001 Study on seed dormancy, *in situ* germination and storage potential of pre-release cultures of groundnut	Dr. V. Manonmani Professor and Head DSST, TNAU, Coimbatore	The project may be closed and completion report may be submitted.
4.	SEC/KKM/SST/OIL/2021/001 Standardization of seed pelleting techniques for mechanical sowing of Gingelly	Dr. K. Indira Professor (SST) AC&RI, Killikulam	The project may be closed and completion report may be submitted.
5.	SEC/CBE/SST/OIL/2022/001 Studies on seed dormancy and storability in sunflower hybrid COH 3 and its parental lines	Dr. R. Vigneshwari Asst. Prof. (SST) DSST, TNAU, Coimbatore	The project may be continued.
6.	SEC/YTP/SST/OIL/2022/01 Standardization of seed production techniques to improve genetic purity in castor hybrid YRCH 2	Dr. R. Vijayan Assoc. Prof. (SST) TCRS, Yethapur	The project may be continued.
B	**Action Plan**		
1.	Development of e-nose sensor for quick detection of seed quality	Dr. K. Raja Assoc. Prof. (SST) Dept. of PBG, ADAC&RI, Trichy Dr. S. Sundareswaran Professor (SST) DABD, TNAU, Cbe	The project may be closed and completion report may be submitted.
2.	In-situ germination in groundnut	Dr. K. Malarkodi Professor (SST) Dr. V. Manonmani Professor and Head DSST, TNAU, Cbe	The project may be continued.
3.	Evaluation of performance of vacuum bagged groundnut kernels in farmers holdings	Dr. K. Raja Prof. (SST) Seed Centre, TNAU, Cbe Dr. K. Natarajan Assoc. Prof. (SST) KVK, Vridhachalam Dr. V. Vakeswaran Assoc. Prof. (SST) ARS, Bhavanisagar	Work may be initiated in the new Action Plan
4.	Effect of mechanized seed production of initial quality and storability of groundnut	Dr. V. Vakeswaran Assoc. Prof. (SST) ARS, Bhavanisagar Dr. R. Jerlin Prof. (SST) Dr. V. Manonmani Professor and Head DSST, TNAU, Cbe Dr. K. Natarajan	Work may be initiated in the new Action Plan

S. No.	Project No. & Title	Project Leader	Remarks
		Assoc. Prof. (SST) KVK, Vridhachalam	
5	SEC/CBE/OIL/2023/001 Evaluation of efficacy of seed planter and drone for sowing of pelleted seeds in sesame.	Dr. K. Raja Prof. (SST) Dr. C. Vanitha Assoc. Prof. (SST) Dr. R. Jerlin Prof. (SST) Dr. P. Masilamani Prof. (SST) Dr. K. Natarajan Programm Coordinator	The project may be continued.
C	**GOI-DUS scheme**		
1	PPV/SC/CBE/SST/2003/R001 DUS test centre for Rice and Sunflower under PPV & FR Authority	Dr. V. Manonmani Professor and Head Dr. R. Vigneshwari Asst. Prof. (SST)	The project may be continued.

2. CROP MANAGEMENT

A. Technologies for Adoption/OFT/Information

A1. For Adoption

1. **Development of technology package for castor-cucurbits relay cropping for resource conservation and profit maximization**
   - Castor - ridge gourd relay cropping with better resource conservation has recorded higher system profitability (Rs.357/ha/day), net return of Rs.1,30,515/ha and BCR of 3.29.
   - Altered castor plant architecture through nipping and pruning followed by cucurbits as relay crop in castor, curtails the expenditure on trellis & stake support system of Rs.97,500/ha under traditional panthal/bower/inverted V trellis method as against trailing of tendrils on pruned castor YTP 1 cost about Rs.11,500/ha.

2. **Standardisation of priming method for pod sowing in rainfed groundnut**
   - Contingency planning of pod sowing with pod priming @ 0.5 % $CaCl_2$ produced higher pod yield (2156 kg/ha) under rainfed condition.

A2. For Information

1. **Drought management strategies for improving yield in groundnut**
   Application of 1% PPFM foliar spray at 20 DAS & 0.5 % KCl foliar spray at 45 DAS recorded higher number of pods/plant (35), pod yield (2125 kg/ha) and benefit cost ratio (2.69).

2. **Identification of Groundnut + Small millet intercropping system for *Alfisols* under irrigated condition**
   Groundnut paired row (15/60 cm x 10 cm) intercropped with varagu recorded higher GEY (2489 kg/ha), LER (1.64) and BCR (2.98) under *Alfisols.*

3. **Agronomic options to enhance the productivity of transplanted sesame**
   Transplanting 20 days old sesame seedlings in ridges recorded higher seed yield of 895 kg ha^{-1} with net income of 57824 Rs. ha^{-1} and B:C (2.60) followed by ridge planting of 16 days old seedling (836 kg ha^{-1}, 51577 Rs. ha^{-1} and 2.43).

B2. On Farm Testing (OFT)

OFT 1 Evaluation of Sulphur Oxidizing Bacterial (SOB) Inoculum on Sunflower Productivity

Objectives

- To assess the performance of sulphur oxidizing bacterial inoculums on sunflower

Treatments

T_1 - RDF (60:90:60:20 kg NPK & S ha^{-1})

T_2 - RDF (60:90:60:20 kg NPK & S ha^{-1}) + SOB soil application @ 2 kg ha^{-1}

Coordinating Centre:

Dept. of Oilseeds, TNAU, Coimbatore

Dr. M Senthivelu, Assoc. Prof. (Agron.)

Sub- Centres:

MRS, Vagarai

Dr. T. Selvakumar, Assoc. Prof. (Agron.) & Head

KVK, Tirur

Dr. K. Sivagamy, Asst. Prof. (Agronomy)

ARS, Kovilpatti

Dr. S. Manoharan, Asst. Prof. (Agronomy)

Season: *Kharif* 2023

Observations to be recorded

- Seed yield (kg/ha)
- Oil content (%)
- Economics

OFT 2 Effect of green manure incorporation on yield of a subsequent groundnut crop

Treatments

M_1 - Control - Groundnut

M_2 - Sunnhemp incorporation - Groundnut (75 % RDF)

Objectives

- To improve peg penetration, pod development and pod yield of groundnut
- To work out the economics

Coordinating Centre:

ORS, Tindivanam

Dr. S. Thiruvarassan, Assoc. Prof. (Agron.)

Sub-Centres:

RRS, Vriddhachalam

Dr. R. Baskaran, Assoc. Prof. (Agronomy)

AC & RI, Vazhavachanur

Dr. P. Ayyadurai, Asst. Prof. (Agronomy)

Season: *Kharif* 2023

Observations to be recorded

- Peg to pod ratio (%)
- Pod yield (kg/ha)
- Economics

OFT 3Weed management in sesame

Treatments

T_1 - Weedy Check

T_2 - Pendimethalin 30% EC +Imazethapyr 2% SL 250 g a.i./ha (PE) fb Quizalofop ethyl 5% EC @ 50 g a.i/ha at 20 DAS

Objectives

- To study the efficacy of pre and post emergence herbicide for sesame
- To study the effect of pre and post emergence herbicide on economics of sesame

Coordinating Centre:

RRS, Vridhachalam

Dr. C. Harisudan, Assoc. Prof. (Agron.)

Centres:

ORS, Tindivanam

Dr. S. Thiruvarassan, Assoc. Prof. (Agron.)

KVK, Tirur

Dr. K. Sivagamy, Asst. Prof. (Agronomy)

AC & RI, Vazhavachanur

Dr. P. Ayyadurai, Asst. Prof. (Agronomy)

Season: *Kharif* 2023

Observations to be recorded

- Seed yield
- Weed control efficiency
- Economics

OFT 4 Effect of suitable chemical formulation to arrest late formed flowers and enhance the yield of groundnut

Objectives

- To develop suitable chemical formulation to arrest late formed flowers
- To study the effect of flower arresting formulation on the flowering, maturity and yield characters of groundnut

Treatments

T_1 - Control

T_2 - Flower arresting formulation @ 250 ml/ha

Coordinating Centre:

AC & RI, Killikulam

Dr. S. Srininvasan, Prof. & Head

Sub-Centres:

RRS, Vriddhachalam

Dr. C. Harisudan, Assoc. Prof. (Agronomy)

ORS, Tindivanam

Dr. S. Thiruvarassan, Assoc. Prof. (Agronomy)

ARS, Bhavanisagar

Dr. N. Sakthivel, Prof. & Head

AC&RI, Kudumiyanmalai

Dr. J. Rajkumar, Asst. Prof. (CRP)

Season: *Kharif* 2023

Observations to be recorded

- Pod yield
- Economics

C. RESEARCH PROJECTS AND REMARKS

S. No.	Projects	Groundnut	Sesame	Sunflower	Castor	Total
1.	Agronomy	11	8	3	9	31
2.	Crop Physiology	1	1	-	-	2
	Total	12	9	3	9	33

S. No.	Project No. & Title	Project leaders	Duration	Remarks
ACTION PLAN PROJECTS				
1.	Developing technology package for castor-cucurbits relay cropping for resource conservation and profit maximization.	Dr. P. Veeramani, Asst. Prof. (Agronomy) Dr. P.S. Kavitha, Assoc. Prof. (Hort.) Dr. C. Harisudan, Assoc. Prof. (Agronomy)	June 2020 to May 2023	• The project may be closed • The results may be given for adoption and included in CPG.
2.	DCM/TVM/AGR/GNT/2020/002 Effect of green manure incorporation on yield of a subsequent groundnut crop	Dr. S. Thiruvarassan Assoc. Prof. (Agron.)	July 2020 to June 2023	• The project may be closed • The results may be proposed for OFT
3.	DCM/VRIAGR/OIL/2023/001 Response of groundnut (*Arachis hypogaea*) to foliar nutrition of nano urea and urea phosphate	Dr. R. Baskaran, Assoc. Prof. (Agronomy) Dr. S. Thiruvarassan Assoc. Prof. (Agronomy)	June 2022 to June 2024	• The dose in ml/ha may be calculated • The title may be changed by deleting urea phosphate • The project may be continued.
4.	Optimizing nutrient requirement for mono stem sesame culture VRI 5	Dr. C. Harisudan, Assoc. Prof. (Agronomy) Dr. S. Thiruvarassan Asst. Prof. (Agronomy)	June 2022 to May 2024	• The project may be continued
5.	Assessment of mono stem sesame variety VRI 5 for abiotic stress tolerance (Drought, high temperature and salinity)	Dr. R. Sivakumar, Prof. (Crop Physiology) Dr. R. Karthikeyan Assoc. Prof. (Agronomy)	June 2022 to May 2024	• The project may be continued under high temperature and salinity stress

GROUNDNUT				
UNIVERSITY RESEARCH PROJECTS				
AGRONOMY				
6.	DCM/EKT/AGR/GNT/2020/001 Identification of Ground nut + small millets inter cropping system for alfisols under Irrigated condition	Dr. K. Venkatalakshmi Assoc. Prof. (Agronomy)	Jan 2020 to May 2022	• The project may be closed • The results may be given for information
7.	DCM/APK/CRP/GNT/2021/001 Development of suitable chemical formulation to arrest late formed flowers and enhance the yield of Groundnut	Dr. S. Srinivasan, Prof. & Head (CRP), Dr. C. Harisudan Assoc. Prof. (Agronomy) Dr. N. Sakthivel, Prof. & Head	May 2021 to June 2023	• The project may be closed • The results may be given for OFT

S. No.	Project No. & Title	Project Leaders	Duration	Remarks
SESAME				
AGRONOMY				
8.	**DCM/KKM/AGR/SES/2020/001** Agronomic options to enhance the productivity of transplanted sesame	Dr. J. Bhuvaneswari Asst. Prof. (Agronomy)	November 2020 - May 2022	• May be closed and completion report may be submitted • The results may be given for information
CASTOR				
9.	**DCM/YTP/NON/2022/001** Influence of Nutriseed pack placement on growth and yield of different castor hybrids under irrigated condition	Dr. P. Veeramani, Asst. Prof. (Agronomy), TCRS, Yethapur Dr. G. Sridevi Asst. Prof. (Soil science), Dept. of SS&AC, TNAU,	June 2022 - May 2025	• The project may be continued
EXTERNALLY FUNDED PROJECT				
10.	Developing best management practices for sesame cultivation (after rice) under rice-sesame cropping system	Dr. C. Harisudan Assoc. Prof. (Agronomy) Dr. K. Subrahmaniyan Director, TRRI, ADT	April 2019- March 2022	• The project may be closed
AICRP Projects				
GROUNDNUT				
11.	**AICRP/PBG/VRI/GNT/017**	Dr. R. Baskaran Assoc. Prof. (Agronomy)	2021-22 to 2023-24	• The project may be continued

S. No.	Project No. & Title	Project Leaders	Duration	Remarks
	Integrated weed management in Rabi/summer groundnut with Diclosulam			
12.	**AICRP/PBG/VRI/GNT/017** Sustainable groundnut production through crop diversification and tillage systems	Dr. R. Baskaran Assoc. Prof. (Agronomy)	2021-22 to 2023-24	• The project may be continued
13.	**AICRP/PBG/VRI/GNT/017** Evaluation of rhizobia for enhancing BNF and yield of kharif and rabi- summer groundnut	Dr. R. Baskaran Assoc. Prof. (Agronomy)	2022-23 to 2023-24	• The project may be continued
14.	**AICRP/PBG/VRI/GNT/017** Response of groundnut (*Arachis hypogaea)* to foliar nutrition of nano urea and urea phosphate	Dr. R. Baskaran Assoc. Prof. (Agronomy)	2022-23 to 2023-24	• The project may be continued
15.	**AICRP/PBG/VRI/GNT/017** Organic farming experiment on permanent basis in prominent cropping system of the respective region	Dr. R. Baskaran Assoc. Prof. (Agronomy)	2022-23 to 2023-24	• The project may be closed
16.	**AICRP/PBG/TVM/GNT/019** Response of groundnut to limited irrigation during post rainy/summer season	Dr. S. Thiruvarassan Assoc. Prof. (Agronomy)	2019-20 to 2021-22	• The project may be closed
17.	**AICRP/PBG/TVM/GNT/019** Effect of foliar application of water-soluble fertilizer on growth, yield and nutrient uptake of summer groundnut	Dr. S. Thiruvarassan Assoc. Prof. (Agronomy)	2019-20 to 2021-22	• The project may be closed
18.	**AICRP/PBG/TVM/GNT/019** Integrated weed management in Kharif Groundnut	Dr. S. Thiruvarassan Assoc. Prof. (Agronomy)	2019-20 to 2021-22	• The project may be closed
SESAME				
19.	**AICRP/PBG/VRI/SES/021** Optimization of nutrient requirement for AVT genotypes	Dr. C. Harisudan Assoc. Prof. (Agron)	July 2019 to May 2022	• The project may be continued
20.	**AICRP/PBG/VRI/SES/021** Development of full Organic package of practice for export quality Sesame	Dr. C. Harisudan Assoc. Prof. (Agron)	June 2021 to May 2024	• The project may be continued
21.	**AICRP/PBG/VRI/SES/021** Evaluation of pre-emergence and post emergence weed management in sesame (An Alternative to Pendimethalin)	Dr. C. Harisudan Assoc. Prof. (Agron)	June 2021 to May 2024	• The project may be closed • The results may be proposed for OFT
22.	**AICRP/PBG/VRI/SES/021** Comparative nutrient management options for organic sesame production	Dr. C. Harisudan Assoc. Prof. (Agron)	June 2021 to May 2024	• The project may be continued

S. No.	Project No. & Title	Project Leaders	Duration	Remarks
23.	**AICRP/PBG/VRI/SES/021** Assessment of effect of nano urea in sesame	Dr. C. Harisudan Assoc. Prof. (Agron)	June 2021 to May 2024	• The project may be continued
SUNFLOWER				
24.	**AICRP/DCM/CBE/AGR/SNF/2020/002** Performance evaluation of Sulphur Oxidizing Bacterial (SOB) Inoculums on Sunflower	Dr. M. Senthivelu Assoc. Prof. (Agron)	June, 2021 to May 2023	• The project may be closed • The results may be proposed for OFT
25.	**AICRP/DCM/CBE/AGR/SNF/2020/003** Response of Sunflower to Nano-Nitrogen	Dr. M. Senthivelu Assoc. Prof. (Agron)	June, 2021 to May 2022	• The project may be continued
26.	**AICRP/DCM/CBE/AGR/SNF/2020/003** Good Agricultural Practices for Sustainable Productivity of Cropping System Involving Sunflower (Cropping System: Groundnut - Sunflower)	Dr. M. Senthivelu Assoc. Prof. (Agron)	June, 2021 to May 2022	• The project may be continued
CASTOR				
27.	**AICRP/PBG/YTR/CAS/022** Yield maximisation of castor through Best Management Practices	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued
28.	**AICRP/PBG/YTR/CAS/022** Development of Conservation Agricultural practices in Castor	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued
29.	**AICRP/PBG/YTR/CAS/022** Studies on High Density Planting in *Rabi* Castor	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued
30.	**AICRP/PBG/YTR/CAS/022** Efficacy of nano urea on growth, yield and quality of rainfed castor	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued
31.	**AICRP/PBG/YTR/CAS/022** Evaluation of pre-emergence herbicide molecules in castor	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued

32.	**AICRP/PBG/YTR/CAS/022** Agronomic Requirements of Pre-release Castor Hybrids (of AHT-II)	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued
33.	**AICRP/PBG/YTR/CAS/022** Frontline Demonstrations	Dr. P. Veeramani Asst. Prof. (Agron)	June 2021 - May 2024	• The project may be continued

New Action Plan for 2023-24

No.	Title	Centre and Scientists	Period
1.	**Assessment of liquid groundnut rich through drone application on yield enhancement in groundnut**		
Objectives: • To assess the dosage of liquid groundnut rich through drone application on pod yield of groundnut.			
Centre & Scientist In-charge		**AC & RI, Coimbatore** Dr. R. Sivakumar, Professor (CRP) **AC & RI, Madurai** Dr. T. Sivakumar, Professor (CRP) **AC&RI, Vazhavachanur** Dr. R. Ananthi, AP (CRP) **AC&RI, Kudumiyanmalai** Dr. J. Rajkumar, Asst. Prof. (CRP)	June 2023 to May 2025

Treatments

T_1 - Control
T_2 - TNAU Liquid Groundnut Rich (3%)
T_3 - TNAU Liquid Groundnut Rich (4%)
T_4 - TNAU Liquid Groundnut Rich (5%)

Design: RBD **Replications**: Five **Season**: *Kharif* 2023

Observations

- SLW, CGR, NAR, Test Weight, Pod yield
- Economics

No.	Title	Centre and Scientists	Period
2.	**Physiological interventions to improve yield in Sunflower**		
Objectives: • To study the effect of sunflower foliar formulation on seed yield of sunflower. • To study the effect of sunflower foliar formulation on economics of sunflower			
Centre & Scientist In-charge		**AC&RI, Killikulam** Dr. S. Srininvasan, Prof. & Head **Dept. of Crop Physiology, TNAU, Coimbatore** Dr. R. Sivakumar, Professor (Crop Physiology) **AC&RI, Kudumiyanmalai** Dr. J. Rajkumar, Asst. Prof. (CRP)	June 2023 to May 2025

Treatments

T_1 - Conventional Method
T_2 - T_1 + Sunflower foliar formulation I
T_3 - T_1 + Sunflower foliar formulation II
T_4 - T_1 + Sunflower foliar formulation III
T_5 - T_1 + Sunflower foliar formulation IV

Design: RBD **Replications**: Four **Season**: *Kharif* 2023

Observations

- Plant height, SLW, CGR, NAR, Head diameter, Test weight, Seed yield
- Economics.

No.	Title	Centre and Scientists	Period
3. Performance of maize harvester in different crop spacing of hybrid castor (YRCH 1)			
Objectives: • To study the performance of maize, combine harvester in different spacing of hybrid castor			
Centre & Scientist In-charge		**TCRS, Yethapur** Dr. S. Manickam, Prof. & Head Dr. P. Veeramani, Asst. Prof. (Agronomy)	June 2023 to May 2025

Treatments

T_1 - 75 cm x 45 cm - 29,629 (No. of plants/ha)
T_2 - 75 cm x 60 cm - 22,222 (No. of plants/ha)
T_3 - 90 cm x 45 cm - 24,691 (No. of plants/ha)
T_4 - 90 cm x 60 cm - 18,518 (No. of plants/ha)
T_5 - 120 cm x 90 cm - 9,259 (No. of plants/ha)

Design: RBD **Replications**: Four **Season**: *Kharif* 2023

Observations

- Growth and yield parameters
- Economics

No.	Title	Centre and Scientists	Period
4. Effect of pre and post emergence herbicides on weed management in groundnut			
Objectives: • To study the effect of pre and post emergence herbicides on weed management in groundnut • To work out the economics of pre and post emergence herbicides on weed management in groundnut			
Centre & Scientist In-charge		**RRS, Vridhachalam** Dr. R. Baskaran, Assoc. Prof. (Agronomy) **ORS, Tindivanam** Dr. S. Thiruvarassan, Assoc. Prof. (Agronomy) **Dept. of Oilseeds, TNAU, Coimbatore** Dr. M Senthivelu, Assoc. Prof. (Agronomy) **KVK, Needamangalam** Dr. V. Karunakaran, Asst. Prof. (Agronomy)	June 2023 to May 2025

Treatments

T_1 - Diclosulam 84 WDG @ 25 g a.i ha^{-1} (PE) fb Quizalofop Ethyl 5% EC 50 g a.i.ha^{-1} (POE) at 35 DAS
T_2 - Pendimethalin 30 % E.C.@ 1.0 kg a.i. ha^{-1} (PE) fb Quizalofop Ethyl 5% EC 50 g a.i., ha^{-1} (POE) at 35 DAS
T_3 - Hand weeding twice at 20 and 40 DAS
T_4 - Weedy check

Design: RBD Replications: Five Season: *Kharif*, 2023

Observations

- Growth and yield parameters
- Weed control efficiency
- Economics

3. NATURAL RESOURCE MANAGEMENT

A. Technologies for Adoption/OFT/Information

A1. For Adoption

1. Iron Management Strategies for Groundnut in calcareous soil

- For groundnut grown in iron deficient calcareous soil, application of 1%ferrous sulphate + 0. 1 % citric acid at vegetative, flowering and peg formation stages (30,40 & 50 DAS) + seed coating of siderophore producing bacteria (*Bacillus subtilis*) @ 200 g ha^{-1} + soil application @ 500 g ha^{-1} recorded highermean pod yield (2601 kg ha^{-1}&20 % increase over NPK), iron uptake (457 g ha^{-1}), per cent iron transfer to kernel (17.86 %), response Ratio (17 kg kg^{-1}) and Benefit Cost ratio (2.62).

2. Evaluation of amendments and microbial consortia for improving the productivity of Groundnut on Calcareous soils

- Application of soil test based NPK + 80 kg S as Elemental sulphur + 12.5t FYM + 500 ml calcite dissoluting microbial consortia ha^{-1}in calcareous soil for groundnut recorded higher pod yield (2104 kg ha^{-1}) and BCR (2.51) with the yield increase of 25.2% over farmer's practice. The same treatment increased the nutrient availability in calcareous soil (16 to 28.4%) by considerably reducing the soil pH (11.4%) and soil calcareousness (18.5%).

A2. For Information

1. Assessment of Quality Parameters of Sesame Landraces

Among the eight landraces assessed for their quality parameters, the range values were as follows: crude protein: 17.33 (MDU) -21.00 % (TVM), oil content: 48.7 (TVM) – 52.3 % (Kulithalai), total phenol: 1.98 (Karur) - 5.74 mg g^{-1} (MDU), total Flavonoides: 1.04 (MDU) - 2.48 mg g^{-1} (Salem). The unsaturated fatty acids recorded were in the descending order as follows: Linoleic acid > Oleic acid >Palmitic acid > Stearic acid and landraces high in PUFA were as follows: Cuddalore>Thiruvannamalai>Thirukattupalli> Madurai 2.

2. Permanent Manurial Experiment on Rainfed Groundnut - Cold weather Gingelly (Year of start:1990)

Permanent Manurial Experiment at ORS, Tindivanam revealed that STCR based 100% NPK + FYM@12.5 t ha^{-1} + herbicide application @2 L ha^{-1} of Pendimethalin has recorded maximum pod yield of 1305 kg ha^{-1} in groundnut, maximum seed yield of 486 kg ha^{-1} in gingelly and built- up of 5.7% of organic carbon, 6.7% available N, 43% available P & 4.2% available K.

3. STCR-IPNS based Fertilizer Recommendation for Hybrid Castor on *Alfisol*

Fertilizer prescription equations (FPEs) were developed and validated to prescribe fertilizer doses for desired yield target of Castor (hybrid YRCH 1) under IPNS on Yethapur soil series (*KanhaplicRhodustalf*– red non-calcareous) of Tamil Nadu.

Fertilizer Prescription Equations for Castor (hybrid YRCH1)

FN	=	10.38 T - 0.70 SN - 0.69 ON
FP_2O_5	=	4.62 T - 3.60 SP - 0.89 OP
FK_2O	=	6.30 T - 0.44 SK - 0.60 OK

where, FN, FP_2O_5 and FK_2O are fertilizer N, P_2O_5 and K_2O supplied in kg ha^{-1} respectively; T is the targeted yield in q ha^{-1}; SN, SP and SK are alkaline $KMnO_4$-N, Olsen-P and NH4OAc-K in kg ha^{-1} respectively and ON, OP and OK are the quantities of N, P and K in kg ha^{-1} respectively supplied through FYM.

Fertilizer saving of 39, 25 and 30 kg ha^{-1} N, P_2O_5 and K_2O, respectively was obtained when FYM was applied @ 12.5 t ha^{-1} (moisture content - 24%, 0.59% N, 0.29% P and 0.53% K). Results of the two validation experiments revealed that STCR-IPNS-2.75
t ha^{-1} of castor had recorded higher seed yield (2.71 t ha^{-1}) and BCR (2.80) with a yield increase of 19.2, 11.8 and 67.9 %, respectively over blanket (100% RDF alone), blanket plus FYM @ 12.5 t ha^{-1} and farmer's practice with maintenance of soil fertility.

4. **Organic acids and amino acids coated sulphur and micronutrient fertilizers (SMNF) for improving the yield and nutrition of groundnut on calcareous soils**

   Newly synthesized 10% organic acids and Amino acids coated SMNF had greater nutrient release potential up to 45 days in calcareous soils. Soil test based NPK + Fulvic acid coated SMNF @ 15 kg ha^{-1} was superior in improving the growth, yield (26.9%), nutrient availability and economics (BCR: 3.28) of growing groundnut on calcareous soil. Soil test based NPK+ Humic acid coated SMNF @ 12.5 kg (20.4%) was comparable & followed by citric acid-SMNF > glycine-SMNF > salicylic acid-SMNF > uncoated SMNF applied at 15 kg ha^{-1}. The validation experiment confirmed the significant influence of FA & HA coated sulphur & micronutrient fertilizers with a yield increase of 28.9% &20.7% over soil test based NPK respectively.

5. **K rich mineral sources and potash releasing bacteria (KRB-9) on growth promotion and K nutrition acquisition in groundnut**.

   Higher K dissolution rate (54.6%), higher K release (39.3 mg/lit) and pH decline (from 7.2 to 5.2) and higher pod yield of 23.7 pods per plant was recorded in granite waste powder than feldspar, when used as alternative for K fertilizer in groundnut.

6. **Evaluation of Zinc solubilizing bacteria as bioinoculant for Groundnut and Sesame**:

   Application of Zinc solubilising bacteria @ 1 kg/ha as seed treatment and 2kg/ha for soil application along with 12.5 kg/ha $ZnSO_4$ with STCR based fertilizer recommendation recorded maximum pod yield of 1758 kg/ha (13.7% increase over control) under rainfed condition and 2540 kg/ha (14.8 % increase over control) under irrigated condition with B: C ratio of 2.5 and 2.7 respectively. In sesame, application of Zinc solubilizing bacteria @ 1 kg/ha as seed treatment and

2kg/ha for soil application along with 12.5 kg/ha $ZnSO_4$ with STCR based fertilizer recommendation under rainfed condition, recorded maximum capsules of 109.5/plant and yield of 808 kg/ha (12 % over control) with BC ratio of 2.5.

7. **Isolation of Elite Sulphur Oxidising Bacteria and its effect on yield of Sesame in Rice fallow system:**

Of the 24 isolates of Sulphur Oxidising Bacteria (SOB) isolated, SOB3 (4.17), SOB8 (4.20), SOB24(4.15) were screened efficient isolates based on pH reduction, sulphate production and phosphate solubilisation assay. The molecular identification of efficient isolates identified as *Thiobacillus sp* (SOB3), *Paenibacillus lentus* – (SOB8) and *Pseudomonas aeruginosa* (SOB24). The pot culture experiment conducted using application of Gypsum (40kg @ Sulphur) along with *Thiobacillus sp* (SOB3) (soil application and seed treatment) recorded maximum seed yield of 6.7g /plant.

8. **Rhizobial and non-rhizobial endophytes mediated moisture stress mitigation in groundnut:**

Among various plant growth promoting bacteria evaluated, *Rhizobium pusense* S6R2 and *Bacillus tequilensis* NBB 13 showed maximum drought tolerance in 40% poly ethylene glycol (PEG 6000). Co-inoculation of groundnut with *R. pusense* S6R2 *and B. tequilensis* NBB13 alleviated moisture stress better than *R. pusense* S6R2 and *Enterobactercloacae* S23 combinations.

B2. On Farm Testing (new OFT)

OFT 1 Validation of STCR-IPNS based Fertilizer Prescriptions for Hybrid Castor

Objective

- To validate STCR- IPNS based Fertilizer Prescriptions for Hybrid Castor on Red Non - calcareous soils (Yethapur soil series).

Treatments

T_1: STCR-IPNS for yield target 2.75 t ha^{-1}

T_2: Blanket recommendation (RDF + 12.5 t FYM ha^{-1})

T_3: Farmer's fertilization practice

T_4: Absolute control

Locations: Salem, Namakkal and Erode districts

Period :1 year (2023-2024)

Observations

- Seed & Stalk yield
- Oil content & Oil yield
- Initial and Post - harvest soil fertility status

Computed parameters

- Per cent achievement
- Response ratio
- BCR

Lead centre & Scientist In-charge

Department of SS&AC, TNAU, Coimbatore

Dr. R. Santhi, Professor and Head (SS&AC)

Co-ordinating centres & Scientists In-charge

TNAU, Coimbatore : Dr. S. Maragatham, Professor (SS&AC)

TCRS, Yethapur : Dr. S. R. Venkatachalam, Professor (PBG)

HC&RI, Jeenur : Dr. M. Gopalakrishnan, ASP (SS&AC)

OFT 2 Validating the efficacy of Organic acids and amino acids coated sulphur and micronutrient fertilizers (SMNF) for improving the yield and nutrition of groundnut on calcareous soils

Objectives: To validate the efficacy of coated sulphur and micronutrient fertilizers (SMNF) for improving the yield and nutrition of groundnut on calcareous soils

Treatments

T_1 : Soil test based NPK

T_2 : Soil test based NPK + Fulvic acid coated SMNF @ 15 kg ha^{-1}

T_3 : Soil test based NPK + Humic acid coated SMNF @ 12.5 kg ha^{-1}

T_4 : Farmer's Fertilization practice

Period :1 year (2023-2024)

Observations and Analysis

- Pod yield
- Growth and yield attributes
- Nutrient availability
- Nutrient content & uptake
- Economics

Lead centre and Scientist in charge

Department of SS&AC, TNAU, Coimbatore

Dr. T. Chitdeshwari, Professor (SS&AC)

Coordinating centres & Scientists in charge

AC&RI, Kudumiyanmalai : Dr. M. Vijayakumar, Asst. Professor (SS&AC)

AC&RI, Vazhavachanur : Dr. V. Arunkumar, Asst. Professor (SS&AC)

ORS, Tindivanam : Dr.G.Gomadhi, Associate Professor (SS&AC)

OFT 3 Validation of Sulphur Recommendation for Yield Maximization in Sesame under Sesame - Greengram/ Blackgram Cropping Sequence (ongoing & to be continued).

Objectives

- To validate the sulphur recommendation for yield maximization in sesame.
- To assess the residual effect of sulphur on yield and quality of greengram/ blackgram.

Treatments

T_1 - Absolute Control

T_2 - STCR based NPK

T_3 - STCR based NPK + S @ 45 kg ha^{-1}

RDF–STCR based / Sulphur source: Gypsum / (S in SSP will be adjusted)

Observations and Analysis

Sesame

- Seed yield (kg ha^{-1})
- Sulphur uptake in plant
- Oil content in seeds
- Available S & S fractions in soil

Greengram / Blackgram

- Seed yield (kg ha^{-1})
- Sulphur uptake in plants
- Protein content in seeds
- Available S & S fractions in soil

Lead centre& Scientists In-charge

Dept. of SS & AC, TNAU, Coimbatore

Dr. M. R. Backiyavathy, Professor & Head, Dept. of NRM, HC&RI, Periyakulam

Dr. K. Sathyabama, Professor (SS&AC), Dept. of SS&AC, TNAU, Coimbatore

Coordinating centres & Scientists In-charge

Dr. G. Gomadhi, Assoc. Professor (SS&AC), KVK, Tindivanam

Dr. M. Baskar, Professor & Head (SS&AC), ADAC&RI, Trichy

Dr. K. Manikandan, Asst. Professor (SS&AC), TRRI, Aduthurai

OFT 4 Evaluation of Zinc Solubilizing Bacteria as bioinoculant for groundnut & sesame in Zn deficient soil

Treatments

T_1 - Absolute control

T_2 - STCR + $ZnSO_4$ (25 kg/ha)

T_3 - STCR + Zinc Solubilizing Bacteria

T_4 - STCR + $ZnSO_4$ (12.5 kg/ha) + Zinc Solubilizing Bacteria

(Application of Zinc Solubilizing bacteria 1kg/ha as seeds treatment and 2 kg/ha as soil application)

Period: 1 year

Lead centre:

Oilseeds Research Station, Tindivanam:

Dr. E. Jamuna, Associate Professor (Agricultural Microbiology)

Co-ordinating centres & Scientists In-charge

AC&RI, Killikulam : Dr. K.G. Sabarinathan, Assoc. Professor (AGM),
Dr. Lenin raja, Assoc. Prof. (SS&AC),

TNAU, CBE : Dr. R.Parimala Devi, Assoc. Prof. (AGM),
Dr. D. Suganya, Assoc. Prof. (SS&AC),

RRS, Vridhachalam : Dr. G. Gayathry, Assistant Professor (AGM),
Dr. Porkodi, Assistant Professor (Assistant Professor)

AC&RI, Vazhavachanur : Dr. E. Jamuna, Assoc. Professor (AGM),
Dr. V. Arunkumar, Assistant Professor (SS&AC)

Observations and Analysis

- Growth and yield attributes, Soil Physico-chemical properties, Nutrient uptake efficiency
- Available Zn content in soil at different stages of crop
- Zinc biofortification in seed

C. RESEARCH PROJECTS AND REMARKS

S. No.	Projects	Groundnut	Sesame	Total
1.	Soil Science and Agricultural Chemistry	1	1	2
2.	Agricultural Microbiology	2	1	3
	Total	3	2	5

Project Wise Remarks

Soil Science and Agricultural Chemistry

S. No.	Project No. & Title	Project leaders	Duration	Remarks
A.	**Action Plan / University Research Project**			
1	Assessment of quality parameters of TNAU Sesame varieties and land races	Dr. S. Meena, Professor (SS&AC) & Project Director (COE-SSH), AC&RI, Trichy Dr. M. R. Latha, Professor (SS&AC), O/o. CoE, TNAU, CBE	July,2021to March2022	• The salient findings may be given for information • The project may be closed
2	NRM/TVM/SAC/GNT/2015/001 Permanent manurial experiment (PME) on rainfed groundnut and cold weather gingelly	Dr. E. Jamuna, Associate Professor (Agricultural Microbiology)	July 2020to June2025	• The salient findings may be given for information • The project may be continued
B.	**On Farm Trials**			
3.	Iron management strategies for groundnut in calcareous soil	**Lead centre** **Dept. of SS & AC, TNAU, CBE** Dr. S. Meena, Professor (SS&AC) & Project Director (COE-SSH) Dr. S. Karthikeyan, Professor and Head, PHTC, AEC&RI, TNAU, CBE. **Coordinating centre & Scientist In-charge**	2022-23	• The salient findings may be given for adoption • The project may be closed

		Dr. N. Chandrasekaran, Professor (SS&AC), KVK, Sandhiyur Dr. V. Arunkumar, Asst. Prof. (SS&AC) AC&RI, Vazhavachanur Dr. G. Gomadhi, Assoc. Prof. (SS&AC) KVK, Tindivanam		
4.	Validation of sulphur recommendation for yield maximization in sesame under sesame-greengram/blackgram cropping sequence	**Lead centre** **Dept. of SS & AC, TNAU, CBE** Dr. M.R. Backiyavathy Professor and Head (NRM) HC&RI, Periyakulam Dr. K. Sathya Bama, Professor. (SS&AC), TNAU, Coimbatore **Coordinating centres & Scientists In charge** Dr. K. Manikandan, Asst. Prof. (SS&AC) TRRI, Aduthurai Dr. M. Baskar, Professor and Head (SS&AC), ADAC&RI, Trichy Dr. Gomadhi, Assoc. Prof. (SS&AC) KVK, Tindivanam	2022-23	• The OFT may be continued • Blanket recommendation may be included
5.	Evaluation of amendments and microbial consortia for improving the productivity of Groundnut on Calcareous soils	**Lead centre** **Dept. of SS&AC, TNAU, CBE** Dr. T. Chitdeshwari, Professor (SS&AC), Dept. of SS&AC, TNAU, Coimbatore Dr. U. Sivakumar, Professor & Head (AGM), Dept. of Agrl. Microbiology, TNAU, Coimbatore **Coordinating centres** Dr. C. Sudhalakshmi, Assoc. Professor (SS&AC), CRS, Aliyarnagar Dr. S. Suganya, Assoc. Professor (SS&AC),		• The salient findings may be given for adoption • The project may be closed.

		TNAU& ITC, Chennai Dr. G. Gayathri, Asst. Professor (AGM), KVK, Vridhachalam		
C.	**Student thesis**			
6	Inductive cum targeted yield model-based fertilizer prescription through integrated plant nutrition system for castor	Dr. R. Abishek, Ph.D. Scholar Dr. R. Santhi, Professor and Head Department of SS&AC, TNAU, Coimbatore	2022-23	• The salient findings may be given for information • New OFT may be proposed
7	Organic acids and amino acids coated multi-nutrient fertilizers for improving the yield and nutrition of groundnut on calcareous soils	Dr. N. Rukmani Ph.D. Scholar Dr. T. Chitdeshwari Professor (SS&AC) Department of SS&AC, DNRM.TNAU, Coimbatore-641 003	2022-23	• The salient findings may be given for information • New OFT may be proposed

Agricultural Microbiology

S. No.	URP No. & Title	Project leader	Period	Remarks
1.	NRM/TVM/AGM/OIL/2022/002.Influence of potassium releasing bacterium *Paenibacillus mucilaginosus* (KRB-9) and K rich mineral source on growth promotion and nutrient acquisition in Groundnut	Dr. R. Brindavathy, Professor (Ag. Micro.), ORS, Tindivanam Dr. G. Gomadhi, Assoc. Professor (SS&AC), KVK, Tindivanam	Jan. 2022 to Dec. 2024	• The findings given for information • Graded level of K minerals (25, 50, 75) may be done in pot culture studies. • The Project may be continued
2.	NRM/TVM/AGM/SES/2021/001 Studies on the isolation of elite sulphur oxidising bacteria and its effect on the yield and quality of sesame in rice fallow system.	Dr. E. Jamuna, Associate Professor, (Agricultural Microbiology), ORS, Tindivanam Dr. G. Gomadhi, Associate Professor (SS&AC), KVK, Tindivanam	Nov. 2020 to June 2023	• The findings given for information • Comparison studies with existing cultures of SOB may be carried out in pot culture experiment and filed experiment. • The Project may be continued
3.	NRM/TVM/AGM/GNT&SES/2021/001 - Evaluation of Zinc solubilizing bacteria as bioinoculant for Groundnut and Sesame	Dr.E. Jamuna Associate Professor (Agricultural Microbiology) ORS, Tindivanam	Nov. 2020 to June 2023	• The findings given for OFT • Project work may be completed as per schedule and completion report may be submitted.

New Action Plan Project for 2023-2024

1. **Management of Alkali water (High RSC) for enhancing the growth and yield of Sesame**

Objectives:

- To fix the critical RSC level of irrigation water for sesame
- To quantify the gypsum requirement of alkali water for irrigation in sesame
- To study the influence of different levels of RSC water on soil properties, growth and yield of sesame

Treatments

T_1- Control (Untreated alkali water)

T_2- Soil application of Gypsum @ 500 kg ha-1

T_3- Irrigation with gypsum treated alkali water with the RSC level of < 1.25 meq liter^{-1}

T_4- Irrigation with gypsum treated alkali water with RSC level of 1.25-2.50 meq liter^{-1}

T_5- Irrigation with gypsum treated alkali water with RSC level of 2.50 -4.0 meq liter^{-1}

T_6- T_2 + T_3

T_7- T_2 + T_4

T_8- T_2 + T_5

Design: RBD

No. of replications: 3

Observations

- Growth & yield parameters
- Seed and stalk yield

Analysis

- Gypsum requirement
- pH, EC, Exchangeable cations, ESP - initial and post - harvest soil
- Water quality parameters

Scientists involved

Dr. M. Baskar, Professor and Head (SS & AC), ADAC & RI, Trichy

Dr. S. Rathika, Assoc. Professor (AGR), ADAC&RI, Trichy

Dr. V. Dhanushkodi, Assistant Professor (SS & AC), ADAC&RI, Trichy

Action Plan 2: Field evaluation of potash releasing bacteria on the growth promotion and nutrient acquisition in groundnut

Project Period: 1 Year (2023-2024)

Objectives

- To study K use efficiency of *Paenibacillus mucilaginosus* (KRB-9) and *Frateuria aurantia* on biometrics and yield attributes of groundnut.

Treatment Details

T_1 - Control

T_2 - 100 K as inorganic fertilizer (as per STCR recommendation)

T_3 - 75% K + KRB-9 (Seed treatment (600g /ha seeds) and soil application 2kg/ha)

T_4 - 75% K + *Frateuria aurantia* (Seed treatment (600g /ha seeds) & soil application 2kg/ha)

T_5- 50% K + KRB-9 (Seed treatment (600g /ha seeds) and soil application 2kg/ha)

T_6-50% K + *Frateuria aurantia* (Seed treatment (600g /ha seeds) and soil application 2kg/ha)

*STCR based N and P for all treatments

Design: RBD,

Replication: Four

Lead centre:

Dr. R. Brindavathy, Professor (Agrl. Microbiology), KVK, Tindivanam

Coordinating Centre:

TNAU, Coimbatore:	Dr. R. Anandham, Associate Professor (Agrl. Microbiology), Dept. of Ag. Microbiology, TNAU, CBE
RRS, Virdhachalam:	Dr. C. Harisudan, Associate Professor (Agronomy), RRS, Vridhachalam Dr. G. Gayathri, Assistant Professor (Agrl. Microbiology), KVK, Vridhachalam
AC & RI, Vazhavachanur	Dr. E. Jamuna, Associate Professor (Agrl. Microbiology) Dr. V. Arunkumar, Assistant Professor (SS&AC)

Observations to be recorded: Biometrics & Yield attributes K use efficiency

Large Scale Demonstrations in Farmers' field during 2023 – 2024

S. No.	Title of the Technology	Location and Demonstrations (Nos.)	Scientists In-charge
1.	Organic production of white seeded confectionery sesame	RRS, Vridhachalam (10)	Dr. C. Harisudan
		NOFRC, Coimbatore (2)	Dr. R. Krishnan
		ORS, Tindivanam (10)	Dr. S. Thiruvarassan
		KVK, Tirur (3)	Dr. K. Sivagami
		ARS, Thanjavur (5)	Dr. T. Parthiban
2.	Studies on ready-mix application of pre-emergence herbicide for efficient weed control in groundnut	RRS, Vridhachalam (8)	Dr. R. Baskaran
		ORS, Tindivanam (8)	Dr. S. Thiruvarassan
		Dept. of Oilseeds, TNAU, Coimbatore (3)	Dr. M. Senthivelu
		AC&RI, Kudumiyanmalai (6)	Dr. N. Senthilkumar
		AC&RI, Madurai (5)	Dr. S. Rani
		CRS, Aliyarnagar (5)	Dr. N. Thavaprakaash
3.	Nipping of primary shoot on growth and yield of perennial castor (YTP 1) under irrigated condition	TCRS, Yethapur (10)	Dr. S. Manickam
		RRS, Paiyur (5)	Dr. C. Sivakumar
		ARS, Bhavanisagar (5)	Dr. K. Ramah
		Dept. of Agronomy, TNAU, Coimbatore (3)	Dr. K. Thirukumaran Dr. M. Senthivelu Dr. SP. Sangeetha
		RRS, Vridhachalam (3)	Dr. C. Harisudan

4. CROP PROTECTION

A. TECHNOLOGY FOR ADOPTION /OFT / INFORMATION

I. For Adoption

1. **Management of sesame pests through border crops and organic amendment**

❖ Application of neem cake 250 kg/ha (last ploughing) + 3 rows of maize in border + spraying of Azadirachtin 1500 ppm @ 5 ml/lit on 40 DAS found to be effective in reducing major insect pests (*Antigastra* and leafhopper) in sesame as against the recommended practice, imidacloprid 17.8SL @ 3ml/10 lit on 30 DAS and thiamethoxam 25%WG @ 5gm/10lit on 70 DAS.

2. **Management of castor capsule borer**

❖ IPM Capsule consists of intercropping with blackgram; application of Azadirachtin 1% @ 1.5 ml/lit as prophylactic on 75 DAS followed by spraying of *Beauvaria bassiana*2.5 kg/ha @ 90 &105 DAS; Need based application of *B. bassiana* on 120 DAS found to be effective against castor capsule borer – *Conogethus punctiferalis.*

3. **Biological management of root rot of sesame**

❖ Seed Treatment with *Trichoderma asperellum @* 4g/kg of seed + soil application of *T. asperellum* @ 2.5 kg/ha with FYM @150 kg and VAM 10 kg/ha as basal is recommended for the management of sesame root rot (53.13 percent reduction) with higher yield (568 kg/ha) and BC ratio of 1.98.

II. For On Farm Testing

1. **Management of sesame phyllody vector – Leafhopper**

T_1 - IPDM module (seed treatment with imidacloprid 600 FS @ 7.5 g/kg seed + *Bacillus subtilis* 10 gm/kg of seeds, installation of yellow sticky traps, rouging of infected plants, foliar spray with thiamethoxam 25 WG @ 5 g/10 lit on 30 DAS and imidacloprid 17.8 SL @ 3 ml/10 l on 60 DAS

T_2 - Farmers practice (Spray of imidacloprid 17.8 SL @ 3 ml/10 lit. on 30 DAS and 60 DAS)

T_3 - Control (Sesame alone)

Variety: Popular variety in the Region

Season: *Kharif* 2023 and *Rabi*/summer 2023-2024 (Two Trials)

Replication: Seven

Lead Centre: RRS, Vriddhachalam

Centres		Scientist identified
RRS, VRI*	:	Dr. P. Indiragandhi, Associate Professor (Entomology) Dr. M. Paramasivan, Associate Professor (Pl. Pathology)
TCRS, Yethapur		Dr. P. A. Saravanan, Associate Professor (Entomology) Dr. V. Ravichandran, Associate Professor (Pl. Pathology)
ADAC&RI, TRY	:	Dr. A. Kalyanasundaram, Professor (Entomology) Dr. A. Sangeetha, Asst. Professor (Pl. Pathology)

KVK, APK & DARS, Chettinad	:	Dr. K. Usharani, Assoc. Prof (Entomology) Dr. K. Manonmani, Assoc. Prof (Pl. Pathology)
AC & RI, VVNR	:	Dr. P. Yasodha, Associate Professor (Entomology) Dr. M. Karthikeyan, Associate Professor (Pl Pathology)

* Monitoring Scientist

Observation to be recorded

- Pest population, Damage (%), Phyllody incidence
- Natural enemies' population
- Yield, PDR and BCR

OFT2: IDM for major diseases of sunflower Treatments

T_1: Seed treatment with salicylic acid @ 100ppm; neem oil @ 3 % at 30 DAS; foliar spray of Zineb (68%) +Hexaconazole (4%) WP @ 25 g/10 lit at45 DAS and 60 DAS
T_2: Seed treatment with imidacloprid17.8 SL 10ml/kg seed and two sprays of mancozeb 75 WP @ 1kg/ha during 45 DAS and 60 DAS
T_3: Farmers' Practice (Foliar spray of Mancozeb 75 WP @ 0.1%)
T_4 : Control
Season: *Kharif* and *Rabi*; Plot size: 4x3m; Hybrid: TNAU Sunflower Hybrid CO2; Replications: 5;
Design: RBD

Observations to be recorded

1. Germination percentage
2. Incidence of stem necrosis (%), leafspot / blight (PDI), powdery mildew (PDI)
3. Yield (kg/ha)
4. CB ratio

Centres involved

Co-ordinating centre: Dept. of Oilseeds, TNAU, Coimbatore (Dr. S. Harish, Assoc. Professor (Plant Pathology)

Centre	Scientists identified
Dept. of Oilseeds, TNAU, Coimbatore	Dr. S. Harish, Assoc. Professor (Plant Pathology)
RRS, Vriddhachalam	Dr. T.K.S. Latha, Assoc. Professor (Plant Pathology)
ADAC & RI, Trichy	Dr. M. Rajesh, Asst. Professor (Plant Pathology)

III. For information

A. Agricultural Entomology

Groundnut thrips incidence was noticed to the tune of 1.0-2.04 nos./plant. Leafminer incidence of 1.25 to 11.5% and defoliators incidence of 0.4 to 9.4% was noticed during 2022-2023. In Sesame leaf Webber (0.2-3.73%), Leafhopper (0.5-3.45 nos./plant) and Mirid bug (2.0 - 4.2 nos. / leaf) were registered. In sunflower, leafhopper (0.47-1.67 nos. / leaf) and whitefly (0.2-0.67 nos. / leaf) were recorded. In castor, leafhopper (2.8-26.8 nos./plant), Defoliators (0.1-3.4 nos. / plant) and capsule borer (0.1-3.1%) were observed.

Groundnut

- Out of 28 entries screened, VG 265, VG 19805, VG 19812, VG 19806, MLT GN K - 22 - 7, MLT GN K - 22 - 9 showed resistance against leafhopper.

Castor

- Out of 23 entries screened, YRCH 19014 and YRCH 19016 showed resistance against leafhopper.
- Two sprays of cyantranilprole 10.26% OD @1ml/l (2.25 /leaf) or thiacloprid 21.7SC @ 1ml / l (4.4 /leaf) @ 14 days interval was effective against castor whitefly. Reduction over control in whitefly population was very high (96.2 %).

Sunflower

- Out of 47 entries screened, SFK 2201 (CSFH 19004) and SFR 2202 (CSFH 19087) showed resistance against leafhopper.

B. Plant Pathology

- Disease scenario for oilseed crops in Tamil Nadu were recorded for the major diseases *viz.*, late leaf spot (20.3 – 58.7 PDI) and rust (18.6-42.4 PDI) in groundnut, root rot (9.0% – 23.0%), phyllody (8.0% - 98.5%) and powdery mildew (22.0 – 73.0 PDI) in sesame, powdery mildew (2.5 – 45.3 PDI), leaf spot (15.5 – 75.0 PDI) and necrosis (0.5 – 12.0%) in sunflower, gray mould (12.7-52.6 PDI) and wilt (3.9-18.1%) in castor.

Groundnut

- Based on 10 years weather data prevailed in Aliyarnagar, prediction model was developed for late leaf spot in groundnut.
- Significant positive correlation was observed with maximum and minimum temperature and soil temperature.
- Groundnut MLT lines *viz*., MLT-GN K 22-6, MLT-GN K 22-7, MLT-GN K 22-8, MLT-GN K 22-9 and MLT-GN K 22-13 were found to be resistant for late leafspot and rust diseases.
- Endophytes isolated (TNAU, Coimbatore – 10 Nos., CRS, Aliyarnagar – 5 Nos. and RRS, Vridhachalam – 2 Nos.) from different tissues of groundnut found to be effective against late leaf spot (74.4% reduction) and rust (67.9%) in groundnut.
- Seed treatment with *Bacillus subtilis* (Bbv57) @10 g/kg; foliar spray of tebuconazole 50% + trifloxystrobin 25% @1 g/l at 40 & 60 DAS was effective in managing the late leaf spot (62.4% reduction) and rust (66.3% reduction) diseases in groundnut.

Sesame

- Sesame entry, VS-20040 showed moderately resistant reaction to root rot and powdery mildew diseases.
- Molecular characterization of sesame Phyllody samples showed 98% identity with *Candidatus* phytoplasma *Australasia* (16S sr II-D).
- Susceptibility factor (RAD 23 protein) associated with sesame phyllody was identified by molecular docking for further genome editing research.
- Regression analysis of sesame phyllody incidence with its vector populations over the seasons revealed strong positive correlation.
- The mycoparasite, *Ampelomyces quisqualis* (AQ 003) liquid formulation @ 3.0% was found to be effective for sesame powdery mildew disease (64.42% reduction).

Sunflower

- Sunflower entry, CSFH 19004 showed moderately resistant reaction to leaf spot and powdery mildew diseases.
- Themycoparasite, *Ampelomyces quisqualis* (AQ003) liquid formulation @ 3 % was found to be effective for sunflower powdery mildew disease (84.48% reduction).

Castor

- Seed treatment with carbendazim @ 2g/kg and foliar spray of propiconazole @ 0.1% at 45 DAS and carbendazim at 60 DAS and azoxystrobin 75 DAS was effective in managing the gray mold incidence (71.34% reduction in disease with an increased yield of 853 kg/ha than the control).

B. ACTION PLAN 2023-24

Action Plan 1. Monitoring pests and diseases of groundnut, sesame, castor and sunflower

a. Pests

Theme leaders	**Dr. P. Indiragandhi, Associate Professor (Entomology), RRS, Vriddhachalam**		
Activity	**Name of the Scientist(s) and Centre(s)**	**Observations to be made**	**Deliverables**
1. Monitoring the regular and emerging pests of oilseeds 2. *In situ* assessment of insect pests and natural enemies 3. Fixed and roving survey during specific crop season 4. On campus fixed plot study in identified crops at mentioned centres 5. Collection of insect pest and their symptoms photographs for development of AI based diagnosis.	**RRS, VRI (Roving & Fixed plot survey)** Dr. B. Geetha, Professor (Entomology) (Groundnut - Cuddalore, Villupuram & Kallakurichi Dts.) Dr. P. Indiragandhi, Assoc. Prof. (Ento.), (Sesame - Cuddalore, Villupuram & Kallakurichi Dts.) **TCRS, YTP (Roving & Fixed plot survey)** Dr. P. A. Saravanan, Assoc. Prof. (Ento.) (Castor-Salem Dt.) **TNAU, CBE (Fixed plot survey)** Dr. E. Sumathi, Professor (Ento.) (Sunflower & Groundnut – Coimbatore Dt.) **KVK, MDU (Roving survey)** Dr. K. Suresh, Assoc. Professor (Ento.), Madurai Dt. **KVK, Sandhiyur (Roving survey)** Dr. M. Ravi, Asso. Prof. (Ento.) Castor- Namakkal Dt.	Incidence of pests are to be monitored throughout the crop period during *Kharif* / *Rabi* / summer. Observations on pest should be recorded at weekly intervals and correlated with weather parameters. Development of forewarning model with available data [Dr. P. Indiragandhi, Assoc. Prof (Ento)] Collection of 500 images for each crop by all the identified scientists. Dr. P. Indiragandhi is identified for collection of photos from all the scientists and submit every month.	Forecasting seasonal incidence of major insect pests. AI based diagnosis and monitoring of invasive insect pests, if any.

b. Diseases

Diseases monitoring of diseases in oilseeds and data set collection for AI based diagnosis

Theme leader	**Dr.B. Meena, Professor (Plant Pathology), CRS, Aliyar nagar**		
Activity	**Name of the Scientist(s)and Centre(s) -Proposed**	**Observations to be made**	**Deliverables**
Monitoring the incidence of important pests and diseases through fixed and roving surveys. Collection of data sets for AI based disease diagnosis	**Groundnut** Dr. B. Meena- CRS, Aliyarnagar Dr. T. K.S. Latha, RRS, Vridhachalam **Sesame** Dr. M. Paramasivan, RRS, VRI **Castor** Dr. V, Ravichandran, TCRS, Yethapur **Sunflower** Dr. S. Harish, Dept. of Oilseeds, TNAU, Cbe	• Incidence of pest and diseases are to be monitored throughout the crop period in all seasons through both fixed plot and roving survey. • Pest and disease incidence is to be correlated with weather parameters. • A forewarning model has to be developed leaf spot and rust diseases of groundnut with available data by CRS, Aliyarnagar centre (Dr. B. Meena, Professor (Plant Pathology). • Revalidation of thumb rule determined by the Aliyarnagar centre in all centres. • Collection of minimum 500 images for each major diseases in each crop covering all the seasons / varieties.	• Forecasting seasonal occurrence of major diseases • Monitoring of new diseases, if any • AI based disease diagnosis

Action Plan 2. Identification of resistant sources and mechanisms of resistance for insect pests

a. Pests

Theme leader	**Dr. B. Geetha, Professor (Entomology), RRS, Vriddhachalam**		
Activity	**Name of the Scientist(s) and Centre(s)**	**Observations to be made**	**Deliverables**
Identification of resistant sources for defoliators and sucking pests	**RRS, VRI** Dr. B. Geetha, Professor (Ento.) (Groundnut) **RRS, VRI** Dr. P. Indiragandhi, Assoc. Professor (Ento.) (Sesame) **CRS, ALR** Dr. R. Arul Prakash, Assoc. Professor (Ento.) (Groundnut) **TCRS, YTP** Dr. P.A. Saravanan, Assoc. Professor (Ento.) (Castor) **TNAU, CBE** Dr. E. Sumathi, Professor (Ento.) (Sunflower to be carried out with Pl. Pathologist working in Oilseeds)	❖ Screening of cultures in pipeline at research stations. ❖ Biochemical and molecular mechanisms of resistance Physical: Trichome length & density, leaf size & thickness, leaf colour. ❖ Biochemical: phenols, protein, tannin, carbohydrate and reducing sugars. ❖ Confirmation of resistance in most promising entries/identified for release through artificial screening	Mechanism of resistance explored in pre-release cultures and for the release of new variety.

Action Plan 3. Testing the compatibility of nano urea formulation with insecticides and fungicides

Theme leader	**Dr. P. Indiragandhi, Associate Professor (Entomology), RRS, Vriddhachalam**		
Activity	**Name of the Scientist(s) and Centre(s)**	**Observations to be recorded**	**Deliverables/ expected outcome**
Identification of newer molecule insecticides/fungicides compatible with nano urea T_1 - Azadirachtin 1.5ml/lit T_2- Cyantraniliprole 10.3% OD @ 1ml/lit T_3 -Spinetoram 11.70 SC 1ml/lit T_4 -Clothionidin 50 WDG 0.2 g/ lit T_5 -Thiamethoxam 25WG @ 0.5gm/lit T_6 -imidacloprid 600 FS @ 7.5 g/kg T_7 – Carbendazim 1.0gm/lit T_8 -Mancozeb 2gm/lit T_9 -Wettable sulpur - T_{10}-Control Replication: Three Design: RBD	**RRS, VRI (Sesame)** Dr. P. Indiragandhi, Assoc. Prof. (Ento), Dr. M. Paramasivan, Assoc. Prof. (Plant Pathology) **TNAU, CBE (Sunflower)** Dr. M. Kannan, Assoc. Prof. (Ento) Dr. S. Harish, Assoc. Prof. (Plant Pathology)	❖ Phytotoxicity ❖ Physical compatibility ❖ Biological compatibility ❖ Chemical compatibility ❖ Insect pest population and Disease incidence ❖ Yield and BCR	Establishment of information on compatibility between nano urea and pesticides

Action Plan 4. Management of castor whitefly

Theme leader	**Dr. P. A. Saravanan, Associate Professor (Entomology), TCRS, Yethapur**		
Activity	**Name of the Scientist(s) and Centre(s)**	**Observations to be recorded**	**Deliverables / expected outcome**
T_1-Azadirachtin 1% @1.5ml/lit at 60 DAS + *Beauveria bassiana* ($1x10^{-8}$) @ 4g/lit at 75DAS T_2-Cyantraniliprole 10.3% OD @ 1ml/lit at 60 DAS and Spinetoram 11.70 SC 1ml/lit at 75 DAS T_3-Clothionidin 50 WDG 0.2 g/ lit at 60 DAS and Thiamethoxam 25WG @ 0.5gm/lit at 75 DAS T_4- Control Variety: YRCH1 Replication: 7 Season: *Rabi* 2024	**TCRS, YTP** Dr. P. A. Saravanan, Assistant Professor (Entomology) **RRS, VRI** Dr. B. Geetha, Professor (Entomology) **KVK, Sandhiyur** Dr. M. Ravi, Associate Professor (Entomology)	• Whitefly nymph and pupae should be recorded from top 3 leaves in ten plants per replication. • Observation on 0, 7 and 14 days after each spray	• Suitable chemical for whitefly management will be identified

Action Plan 5. Exploration of endophytes for late leaf spot and rust diseases in groundnut (cont..)

Theme leader	**Dr. T. K.S. Latha, Associate Professor (Pl Pathology), RRS, Vridhachalam**		
Activity	**Name of the Scientist(s) and Centre(s)-Proposed**	**ProposedActivitiesfor2023-2024**	**Deliverables**
Isolation and morpho-molecular characterization of bacterial / fungal endophytes from groundnut	Dr. T. K. S. Latha, RRS, Vridhachalam Dr. B. Meena CRS, Aliyarnagar Dr. S. Harish TNAU, Coimbatore	• Isolation and identification of bacterial and fungal endophytes from resistant groundnut germplasms. • Molecular characterization through 16sRNA (Coimbatore centre). • Efficacy study under invitro, pot culture and field conditions.	Potential bacterial and fungal endophytes will be obtained for LLS and rust disease management.

Action Plan 6. Characterization of Phytoplasma and management of sesame phyllody through genetic enhancement and endophytes

Theme leaders	**Dr. G. Senthilraja, Asst. Professor (Pl. Path), TNAU, CBE and Dr. M. Paramasivan, Assoc. Prof. (Pl. Path.), RRS, Vridhachalam**		
Activity	**Name of the Scientist(s) and Centre(s)**	**Observations to be recorded**	**Deliverables / expected outcome**
*Morph-molecular characterization of phyllody disease in sesame * Identification of susceptibility genes * Isolation of endophytes * Management T_1-Seed treatment 10 ml/kg of seed and Foliar application of liquid formulation of *Bacillus amyloliquefaciens* 0.75% on 30 and 45 DAS T_2- Spray of imidacloprid 17.8 SL @ 3 ml/10lt. on 30 DAS and 60 DAS T_3- Spraying of tetracyclin 1000ppm T_4-Control Variety: VRI 2 Replication: 5 Sesaon: *Kharif* and *Rabi*	**TNAU, Coimbatore** Dr. G. Senthilraja, Asst. Professor (Pl. Pathology) **RRS, VRI** Dr. M. Paramasivan, Assoc. Professor (Pl. Patho)	➢ Molecular characterization of phytoplasma (cont.) ➢ Collection of endophytes from resistant lines ➢ Identification and validation of susceptibility genes	Potential endophyte will be obtained and effective management strategy will be evolved for phyllody in sesame

Action Plan7. Management of *Botrytis* graymold in castor (New)

Theme Leader	**Dr. V. Ravichandran, Assoc. Prof. (Pl. Path.) TCRS, Yethapur**		
	Name of the Scientist and Centre	**Observations to be recorded**	**Deliverables**
T1- Seed treatment with *Bacillus subtilis* (Bbv57) @ 10g/kgand foliar spray with propiconazole 25 EC @ 1ml/l T_2 - Seed treatment with *Bacillus subtilis* (Bbv57) @ 10g/kgand foliar spray with azoxystrobin 23 SC @ 1ml/l T_2 - Seed treatment with *Bacillus subtilis* (Bbv57) @ 10g/kgand foliar spray with carbendazim 50 WP @1gl/l T4- Seed treatment with *Bacillus subtilis* (Bbv57) @ 10g/kgand foliar spray of *B. subtilis* @ 2 g/l T_5-Seed treatment with *Bacillus subtilis* (Bbv57) @10 g/kg; foliar spray of tebuconazole 50% + trifloxystrobin 25 WG 1 g/l T_6-Untreated control Two sprayings first spray at the initial incidence of disease and second spray at 15 days after first spray	Dr. V. Ravichandran, TCRS, Yethapur	• Per cent Disease index • Capsule borer infestation • Yield (kg/ha) • CB ratio	To develop suitable management practices

Action Plan 8. Exploitation of *Ampelomyces* (AQ003) for the powdery mildew management in sunflower and sesame

<table>
<tr><th>Theme leader</th><th colspan="3">Dr. S. Harish, Associate Professor (Pl. Path), TNAU, Coimbatore</th></tr>
<tr><th>Activity</th><th>Name of the Scientist(s)and Centre(s) -Proposed</th><th>ProposedActivitiesfor2023-024</th><th>Deliverables</th></tr>
<tr><td>Testing the liquid bioformulation of Ampelomyces (AQ 003) for the powdery mildew disease</td><td>Dr. S. Harish, TNAU, Coimbatore
Dr. M. Paramasivan, RRS, Vridhachalam</td><td>Study the efficacy of liquid formulation under field conditions along with standard fungicide
<table>
<tr><th>T. No</th><th>Treatments</th></tr>
<tr><td>T_1</td><td>Foliar application of Ampelomyces @ 3 ml/lit during the onset of disease and 15 days after the first spray</td></tr>
<tr><td>T_2</td><td>Foliar application of Ampelomyces @ 4ml/lit during the onset of disease and 15 days after the first spray</td></tr>
<tr><td>T_3</td><td>Foliar application of Ampelomyces @ 5ml/lit during the onset of disease and 15 days after the first spray</td></tr>
<tr><td>T4</td><td>Standard fungicide check–difenoconazole @0.5ml/lit. or wettable sulphur@ 2g/lit and 15 days after the first spray</td></tr>
<tr><td>T5</td><td>Control</td></tr>
</table>
Observation to be made
Incidence of powdery mildew at 15 days interval Yield and BCR</td><td>Effective management strategy will be evolved for powdery mildew disease in sesame and sunflower</td></tr>
</table>

C.RESEARCH PROJECTS AND REMARKS

List of URP/AICRP/ERP

Discipline	URP	AICRP	Total
Agricultural Entomology	1	3	4
Plant Pathology	7	5	12

University Research Projects

1. AGRICULTURAL ENTOMOLOGY

S. No.	Project No. and Title	Remarks
1.	**CPPS/VRI/ENT/GNT/2020/001:** Screening of wild Arachis Species for resistance against insect pests and diseases (June 2020-May 2023) Dr. C. Vijayaraghavan, Assoc. Prof. (Agrl. Entomology) Dr. T.K.S. Latha, Assoc. Prof. (Plant Pathology), RRS, Vriddhachalam	The project may be closed and completion report should be submitted immediately.

2. PLANT PATHOLOGY

1.	**CPPS/ALR/PAT/GNT/2020/001** Integration of bio agent and fungicides for the management of foliar diseases of groundnut and study of mechanism of ISR (September 2020 to August 2023) Dr. B. Meena, Professor (Plant Pathology), CRS, Aliyarnagar	The mechanism or ISM may be studied in detail and the project may be continued.
2.	**CPPS/VRI/OIL/2023/001** Development of management strategies for foliar disease in groundnut (Dec. 2022 to Nov. 2024) Dr. T.K.S. Latha, Assoc. Prof. (Plant Pathology), RRS, Vriddhachalam	There is no effective management strategies for foliar diseases. Hence the PL will come out with a strategy in this project. The project may be continued.
3.	**CPPS/CBE/PATH/OIL/2023/002** Exploring seed microbiome for the management of seed / collar rot disease in groundnut (January 2023 to December 2025) Dr. T. Anand, Associate Professor (Plant Pathology)	The role of seed endophytes may be delineated. The project may be continued
4.	**CPPS/CTN/PAT/GNT/2020/001** Organic amendment and biocides for the management of soil borne diseases of groundnutunder rainfed conditions. (April 2020 to March 2023). Dr. M. Paramasivan, Assoc. Prof. (Plant Path.), RRS, Vridhachalam	The project may be closed and submit the completion report immediately.
5.	**CPPS/VRI/OIL/2023/001** Evaluation of biocontrol, chemical and organic amendments against Sesame Root rot caused by *Macrophomina phaseolina* (Tassi) Goid (November 2022 to October 2024) Dr. M. Paramasivan, Assoc. Prof. (Plant Path.), RRS, Vridhachalam	The project may be continued and treatment may be modified by sending a separate proposal to RPAC.
6.	**CPPS/YTP/PAT/CAS/2020/001** Evaluation of Biological and Chemical Management practices for *Botryotinia Greymold* and Capsule borer in Castor. (July 2021 to June 2023) Dr. V. Ravichandran, Assoc. Prof. (Plant Path.), TCRS, Yethapur	The project may be closed and send completion repor immediately.
7.	**CPPS/KUM/PAT/2021/001**. Seaweeds and bioagents as integrated biocide treatments for	The project may be continued and submit the proposal for

	controlling Root rot, Alternaria leaf spot and powdery mildew in sesame (June 2020 to May 2023) Dr. P. Mahalakshmi, Asst. Prof. (Plant Path), TNAU, Coimbatore	change of locations.

IV. REMARKS

a. General recommendations

- Season-wise/Variety-wise mapping oilseed crops in Tamil Nadu using Remote sensing technology may be prepared and documented (**Action:** Director, DCARDS/DCWGS/Prof. & Head, ORS, Tindivanam).
- Sale price of bioinoculants may be rationalized (**Action**: DNRM/DCM).
- Priority may be given on community seed production in castor for increasing the area under castor (**Action:** Director, Seed Centre).
- Steps may to be taken to increase the area of VRI 10 groundnut variety by giving more awareness through KVKs and wider publicity on the availability of seeds through TNAU Agricart portal (**Action:** DEE/Director, Seed Centre).
- Demonstrations of newly released oilseed crop varieties may be organized through TN IAMP schemes and the extent of area increase under TNAU varieties may be documented (**Action:** DEE/ DCARDS/DCWGS).
- Steps may to be taken to identity and characterize the potential microorganisms for optimum crop growth (**Action**: DNRM).
- Scientists may be encouraged to publish their research findings in the peer reviewed journals having NAAS rating more than 7 (**Action**: All Scientists).
- Efforts may be made to obtain more externally sponsored schemes (**Action**: All Scientists).

b. Crop Improvement

- Research on Genetic improvement of Soybean may be taken (**Action:** DCPBG).
- Steps may be taken to develop extra early varieties in groundnut with high oleic acid and resistance against foliar diseases (**Action:** DCPBG/DCPPS/DCPBM&B).
- Available germplasm collections in sesame may be utilized properly and possibility of developing monostem sesame variety with herbicide tolerance may be explored (**Action:** Prof. & Head, RRS, VRI/DCM/DCPMB&B).
- Characterization of oil content and quality parameters in black, brown and white seeded sesame varieties may be done and documented (**Action**: Prof. & Head, RRS, VRI, ORS, TVM and Dept. of Biochemistry).
- New alternate crops may be introduced. Possibility of evaluating *Cuphea* may be explored due to its high carbon and lubrication properties (**Action:** DCPBG).
- Research on mustard crop may be initiated and trials may be conducted at Coimbatore, Bhavanisagar and Paiyur (**Action:** DCPBG)

c. Crop Management

- Suitable sesame variety may be identified for Rice-Rice-Sesame cropping system with proper management technology to increase the area and productivity of sesame (**Action:** Prof. & Head, RRS, VRI, ORS, TVM, Director, TRRI, ADT & DCM).
- Standardization of TNAU produced water soluble fertilizer requirement for oilseed crops may be carried out (**Action:** DNRM).
- Development of new enzyme-based bio-mineralizer may be explored for faster decomposition of manures, bioinoculants *etc*. (**Action**: DNRM).
- Complete mechanization technologies may be demonstrated for mono stem sesame variety VRI 5 in five different locations of 1 ha. each (**Action:** AEC & RI/DCM).
- Small millets may be evaluated as intercrop in groundnut (**Action:** DCM).
- Combined application of nano urea with herbicide using drone may be standardized for major oilseed crops (**Action:** DCM, NRM & CWGS).
- Efforts may to be taken to identify and characterize the potential microorganisms for crop growth of major oilseed crops (**Action:** DNRM).

d. Crop Protection

- Potential donors may be identified for development of Sesamum varieties resistance to Root rot /*Phyllody* disease (**Action**: DCPPS/DCPBG)
- Concerted efforts may be taken to intensify research on Sesamum *Phyllody* (**Action**: DCPPS)
- Proper forewarning models may to be developed for the control of key pests/ diseases of oilseed crops (**Action:** DCPPS & DCM).
- All the Crop Protection Scientists may be appraised to monitor the insect pests and diseases of oilseeds crops in their districts regularly. Outbreak of existing pests, disease and nematodes or occurrence of new species if any may be reported to the Director, CPPS immediately (**Action**: All Crop Protection Scientists).
- Management trials for specific soil borne diseases of oilseed crops may be conducted in sick plot (**Action:** DCPPS).
- Efforts may be taken to characterize the *Pseudomonas fluorescens* for effective utilization (**Action:** DCPPS).
- Artificial screening of oilseed germplasms for pests and disease resistance may be done wherever feasible. Proper sick plots for specific diseases may be maintained at TNAU, Coimbatore and RRS Vriddhachalam (**Action:** DCPPS).
- It is learnt that groundnut crop is devoid of nematode infection. Possibility of raising groundnut crop as an intercrop in guava may be examined to reduce nematode infection in guava (**Action:** Prof.& Head, Dept. of Nematology/DCPPS).

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