# TAMIL NADU AGRICULTURAL UNIVERSITY

# PROCEEDINGS

## 55th Oilseeds Scientist Meet 2019
## (May 20-21, 2019)

**Lead Center**
Regional Research Station
Vridhachalam – 606 001, Cuddalore District

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

**2019**

# PROCEEDINGS

## 55th Oilseeds Scientist Meet 2019
## (May 20-21, 2019)

The 55th Crop Scientists' Meet on Oilseeds was held on 20th and 21st May, 2019 at TNAU, Coimbatore. The discipline wise concurrent sessions on crop improvement, crop management and crop protection was held in the concerned Directorate on 20.05.2019. The technical directors reviewed the sub-projects critically and offered their remarks.

The plenary session was held on 21st May, 2019. The session was chaired by Honourable Vice-Chancellor, TNAU, Coimbatore. The Director of Research welcomed the august gathering and presented the overall research highlights. He emphasized the importance of developing appropriate technology for the improvement of oilseeds production in Tamil Nadu. The Director, CARDS presented the scenario of oilseeds in Tamil Nadu and its scope for improvement. Further, he addressed the researchable issues in various oilseed crops. The action taken on the recommendations of the previous crop scientists meet were presented by the Directors and lead scientists. The research highlights, achievements and action plan for the year 2019-20 in the discipline of crop improvement, crop management and crop protection was presented by the respective Directors of CPBG, SCMS and CPPS respectively.

Honourable Vice-Chancellor, in his wrap-up remarks emphasized the importance of developing high yielding varieties to enhance the production potential of oilseeds in Tamil Nadu.

At the end, the Director of Research, TNAU, Coimbatore proposed the vote of thanks.

The proceedings of the 55th meet is furnished as below

### I. CROP IMPROVEMENT

A. Decisions made on the entries for Variety Release Proposal/ART/OFT/MLT evaluation
B. Research projects on Oilseeds
C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
D. Action Plan 2019-2022

## II. CROP MANAGEMENT

A. Decisions made on OFT
B. Research projects on Oilseeds
C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2022

## III. CROP PROTECTION

A. Decisions made on OFT
B. Research projects on Oilseeds
C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
D. General remarks
E. Action Plan 2019-2020

## IV. CLOSING REMARKS AND WAY FORWARD

## V. PARTICIPANTS

# I. CROP IMPROVEMENT

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

### A1. Groundnut: Variety Release

### 1. VG 13163 (Spanish Bunch)

The Spanish bunch culture VG 13163 has been identified and recommended for release. The culture matures in 105-110 days. It recorded a mean pod yield of 2428 kg and 3200 kg/ha respectively under *kharif* and *rabi*/summer seasons, which is 8.44 per cent and 23.4 *per cent* superior over the best check variety VRI 8. The newly evolved culture registered a mean shelling outturn of 70.0 per cent and a mean hundred kernel weight of 44 g. The oil content is 51 *per cent* with a O/L ratio (1.87). It is moderately resistant to late leaf spot and rust diseases (grade 4).

| | |
|---|---|
| Parentage | VG 0420 x VRI Gn 6 |
| Duration (in days) | 105-110 |
| Yield (kg/ha) | 2428 kg/ha (Rainfed): 8.44 % yield increase over VRI 8<br>3200 kg/ha (Irrigated): 23.4 % yield increase over VRI 8 |
| Shelling outturn (*per cent*) | 70.0 |
| Oil content (*per cent*) | 51 |

### 2. VG 13154 (Spanish Bunch)

The Spanish bunch large seeded culture VG 13154 has been identified and recommended for release. The culture matures in 105-110 days. The new culture registered a mean pod yield of 2420 kg and 2929 kg/ha under *kharif* and *rabi*/summer seasons which is 11.7 and 18.2 per cent superior over the best check variety VRI 8. The newly evolved culture registered a mean shelling outturn of 68 per cent and a mean hundred kernel weight of 82 g. The oil content of VG 13154 is 44 *per cent* with 28.18 per cent protein. It is moderately resistant to late leaf spot and rust diseases (grade 5).

| | |
|---|---|
| Parentage | VG 0420 x TVG 004 |
| Duration (in days) | 105-110 |
| Yield (kg/ha) | 2420 kg/ha (Rainfed): 11.7 % yield increase over VRI 8<br>2929 kg/ha (Irrigated): 18.2 % yield increase over VRI 8 |
| Shelling outturn (*per cent*) | 68.0 |
| Oil content (*per cent*) | 44 |
| 100 kernel weight | 82.0g |

**A2. Groundnut: ART**

**Habit Group: Spanish Bunch**

**Season: *Kharif* 2019** **Spacing: 30 x 10 cm**

| Sl. No | Entries/ Checks | Pedigree | Duration (Days) | Pod yield (kg/ha) | Special attributes |
|---|---|---|---|---|---|
| 1 | VG 13163 (R) | VG 0420 x VRI Gn 6 | 105-110 | 2428 (K)<br>3200 (R) | Oil content: 51%<br>Shelling outturn: 70% |
| 2 | VG 13154 (R) | VG 0420 x TVG 004 | 105-110 | 2420 (K)<br>2929 (R) | Shelling outturn: 68%<br>Large seeded type |
| Checks : VRI 8, TMV 14, CO 7 & BSR 2 | | | | | |

**Season : *Rabi*/ summer 2019-20** **Spacing: 30 x 10 cm**

| Sl. No | Entries/ Checks | Pedigree | Duration (Days) | Pod yield (kg/ha) | Special attributes |
|---|---|---|---|---|---|
| 1 | VG 13163 (R) | VG 0420 x VRI Gn 6 | 105-110 | 2428 (K)<br>3200 (R) | Oil content: 51%<br>Shelling outturn: 70% |
| 2 | VG 13154 (R) | VG 0420 x TVG 004 | 105-110 | 2420 (K)<br>2929 (R) | Shelling outturn: 68%<br>Large seeded type |
| Checks : VRI 8, TMV 14, CO 7 & BSR 2 | | | | | |

A total of 40 OFTs may also be simultaneously conducted during *kharif* 2019 and *rabi*/summer 2019-20 seasons to get additional data for release.

**A3. Sunflower : ART**

**Season: *Kharif* 2019** **Spacing: 60 x 30 cm**

| Sl. No | Cultures | Pedigree | Duration (days) | Seed yield (kg/ha) | Yield increase over check (COH 3) | Special features |
|---|---|---|---|---|---|---|
| 1 | CSFH 15020 (N) | COSF12A x IR 6 | 85-90 | 1893 | 11.3 % (1701 kg/ha) | High yield, moderate resistant to powdery mildew and *Alternaria* |
| Checks : COH 3, Sunbred 275 | | | | | | |

## A4. Distribution of ARTs (OILSEEDS)

| District's JDA/ KVK | Trial Number | Groundnut 2019-20 | Sunflower |
|---|---|---|---|
| | Season | *Kharif*(June-July) *Rabi*/Summer(Dec.-Jan.) | *Kharif*(June-July) *Rabi*/Summer(Dec.-Jan.) |
| | Cultures | VG 13163, VG 13154 | CSFH 15020 |
| | Checks | VRI 8, TMV 14, CO 7 & BSR 2 | COH 3, Sunbred 275 |
| Thiruvallur | | 2 | 5 |
| Kancheepuram | | 2 | 5 |
| Villupuram | | 2 | 5 |
| Vellore | | 2 | 5 |
| Thiruvannamalai | | 2 | 5 |
| Cuddalore | | 2 | - |
| Dharmapuri | | - | 5 |
| Krishnagiri | | - | - |
| Salem | | 2 | 5 |
| Namakkal | | 2 | 5 |
| Erode | | 2 | 5 |
| Coimbatore | | 2 | 5 |
| Tiruppur | | - | 5 |
| Thiruchirappalli | | 2 | 5 |
| Perambalur | | 2 | 5 |
| Ariyalur | | - | 5 |
| Karur | | 2 | 5 |
| Pudukkottai | | 2 | - |
| Tanjore | | 2 | 5 |
| Madurai | | 2 | 5 |
| Theni | | 2 | 5 |
| Virudhunagar | | 2 | 5 |
| Tuticorin | | - | - |
| Dindigul | | - | 5 |
| Ramanathapuram | | - | - |
| Sivagangai | | 2 | - |
| Thirunelveli | | 2 | - |
| KVK, Sandiyur | | 2 | 5 |
| KVK, Vridhachalam | | 2 | - |
| KVK, Tinidvanam | | 2 | - |
| KVK, Erode | | 2 | - |
| KVK, Paparapatti | | 2 | 5 |
| KVK, Perambalur | | 2 | - |
| KVK, Vamban | | 2 | - |
| KVK, Karur | | 2 | 5 |
| KVK, Sirugamani | | - | 5 |
| KVK, Needamangalam | | - | - |
| Total | | 56 | 120 |

## A5. Groundnut: Multilocation Trial (MLT)

### Habit Group: SPANISH BUNCH

Season: *Kharif* 2019 & *Rabi* / Summer 2019-20 Replication: Three

Spacing: 30 cm x 10 cm Plot size: 4.0 x 3.0 $m^2$

### Features of the proposed culture

| Sl. No | Culture | Pedigree | Duration (Days) | Pod yield (Kg/ha) | Remarks | Proposed Centre |
|---|---|---|---|---|---|---|
| 1 | VG 14019 (R) | CTMG 7 x CS 19-1 | 105-110 | 2036 | High yield | Vridhachalam |
| 2 | VG 14021 (R) | CTMG 7 x CS 19-1 | 105-110 | 1965 | High yield | Vridhachalam |
| 3 | TVG 12363 (R) | ALG 234 x AK 267 | 105 | 2620 | High yield | Tindivanam |
| 4 | COG 0537 (R) | CO 7 x ICGV 03042 | 105 | 2883 | High yield | Coimbatore |
| 5 | VG 17037 (N) | VRI Gn 6 x IVK-2013-16 | 105-110 | 4062 | High yield | Vridhachalam |
| 6 | VG 17046 (N) | CO 6 x IVK-2013-16 | 105-110 | 3975 | High yield | Vridhachalam |
| 7 | TVG 17180(N) | ICGV 07240 x R 2001-2 | 105-110 | 4412 | High yield | Tindivanam |
| | Checks | CO 7, VRI 8, TMV 14 and BSR 2 | | | | |

Testing centres (8): Vridhachalam, Tindivanam, Coimbatore, Bhavanisagar, Vazhavachanur, Aliyarnagar, Chettinad (*Kharif*) and Paiyur (*Kharif*)

### Observations to be recorded

(1) Plant stand at maturity. (2) Pod yield (kg/plot) (replication-wise), (3) Kernel yield (kg/plot) (replication-wise), (4) Shelling per cent (5) Pod yield (kg/ha) and (6) Kernel yield (kg/ha).

## A6. Sesame: Multilocation Trial (MLT)

Season: *Rabi* 2019-20 and Summer 2019-20 Replication: Three

Spacing: 30 cm x 30 cm Plot size: 4.0 x 3.0 $m^2$

**Features of the proposed culture**

| Sl. No | Cultures | Pedigree | Duration (Days) | Seed yield (kg/ha) | Seed coat colour | Proposing centre |
|---|---|---|---|---|---|---|
| 1 | VS 15-007 (R) | VRI (Sv) 2 x OSC 366-1 | 90 | 993 | Brown | Vridhachalam |
| 2 | VS 15-014 (R) | TMV 7 x Mutant 699 | 90 | 995 | Brown | Vridhachalam |
| 3 | COS 14026 (R) | VRI Sv 1 x *S.malabaricum* | 90 | 1048 | Brown | Coimbatore |
| 4 | ACMS 14-007 (R) | CO 1 x RT 3 | 80-85 | 945 | White | Madurai |
| 5 | VS 16 – 009 (N) | VRI Sv 2 x MT-10-8-1 | 90 | 1042 | Brown | Vridhachalam |
| Checks: TMV 7 and VRI 3 | | | | | | |

**Testing centres (9):** Vridhachalam, Tindivanam, Coimbatore, Srivilliputhur, Killikulam, Madurai, Bhavanisagar, Vazhavachanur and Kattuthottam.

**Observations to be recorded**

(1) Days to 50% flowering, (2) Days to maturity, (3) Plant stand at maturity, (4) Seed yield (kg/plot) (replication-wise) and (5) Seed yield (kg/ha)

**Evaluation of Sesame for earliness**

The culture TVS 14 001 seeds may be evaluated for earliness (70-75 days) in Tanjore, Aduthurai, Vridhachalam, Tindivanam by raising the entries in a single row of 4 m length during *Kharif* 2019.

## A7. Sunflower : Multilocation Trial (MLT)

Season: *Kharif* 2019 & *Rabi* / Summer 2019-20 Replication: Three

Spacing: 60 x 30 cm Plot size: 4.0 x 3.0 $m^2$

**Features of the proposed cultures**

| Sl. No | Cultures | Pedigree | Duration (Days) | Seed yield (kg/ha) | Special features | Proposing centre |
|---|---|---|---|---|---|---|
| 1 | CSFH 15026 (R) | COSF13A x RHA95C-1 | 2315 | 85-90 | High yield | Coimbatore |
| 2 | CSFH 14608 (R) | COSF 7A x IR 6 | 1914 | 85-90 | High yield | Coimbatore |
| 3 | CSFH 14638 (R) | COSF 15 A x CSFI 8002 | 2131 | 85-90 | High yield | Coimbatore |
| 4 | CSFH 16510 (R) | COSF 6A x CSFI 13006 | 2121 | 85-90 | High yield | Coimbatore |
| 5 | CSFH 17078 (N) | COSF 6A x CSFI 13078 | 2128 | 80-85 | High yield | Coimbatore |
| | Checks: Sunbred 275, Hybrid CO 2, COH3 | | | | | |

**Testing centres (7):** Coimbatore, Bhavanisagar, Vridhachalam, Veppanthattai, Killikulam, Tindivanam (*rabi*) and Kovilpatti (*rabi*)

**Observations to be recorded**

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

**A8. Castor : Multilocation Trial (MLT)**

| Sl. No | Cultures | Pedigree | Duration (Days) | Seed yield (kg/ha) | Special features | Proposing centre |
|---|---|---|---|---|---|---|
| 1 | YRCH 16007 (R) | DPC 21 x SKI 215 | 2047 | 180 | Wilt resistant | Yethapur |
| 2 | YRCH 16108 (N) | DPC 17 x YRCS 1904 | 2150 | 180 | Wilt Resistant | Yethapur |
| Checks: YRCH 1, YRCH 2 | | | | | | |

Testing centres (5): Yethapur, Paiyur, Vridhachalam, Tindivanam, Sandhiyur

**Observations to be recorded**

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

## SEED REQUIREMENT FOR CONDUCTING ART/MLT 2019-20

| Sl.No | Name of the Entry / Check | Quantity of seed required (kg) | | Centre responsible for supply |
|---|---|---|---|---|
| | | *Kharif 2019* | *Rabi*/ summer 2019-20 | |
| **GROUNDNUT** | | | | |
| 1 | VG 13163 (R) | 152 | 152 | Vridhachalam |
| 2 | VG 13154 (R) | 152 | 152 | Vridhachalam |
| 3 | CO 7 (C) | 152 | 152 | Coimbatore |
| 4 | VRI 8 (C) | 152 | 152 | Vridhachalam |
| 5 | BSR 2 (C) | 152 | 152 | Bhavanisagar |
| 6 | TMV 14 | 152 | 152 | Tindivanam |
| 7 | VG 14019 (R) | 12 | - | Vridhachalam |
| 8 | VG 14021 (R) | 12 | - | Vridhachalam |
| 9 | TVG 12363 (R) | 12 | - | Vridhachalam |
| 10 | COG 0537 (R) | 12 | - | Coimbatore |
| 11 | VG 17037 (N) | 12 | - | Vridhachalam |
| 12 | VG 17046 (N) | 12 | - | Vridhachalam |
| 13 | TVG 17180(N) | 12 | - | Tindivanam |
| 14 | CO 7 | 12 | - | Coimbatore |
| 15 | VRI 8 | 12 | - | Vridhachalam |
| 16 | BSR 2 | 12 | - | Bhavanisagar |
| 17 | TMV 14 | 12 | | Tindivanam |
| **SESAME** | | | | |
| 1 | VS 15-007 (R) | - | 2.0 | Vridhachalam |
| 2 | VS 15-014 (R) | - | 2.0 | Vridhachalam |
| 3 | COS 14026 (R) | - | 2.0 | Coimbatore |
| 4 | ACMS 14-007 R) | - | 2.0 | Madurai |
| 5 | VS 16 - 009 (N) | - | 2.0 | Vridhachalam |
| 6 | VRI 3 | - | 2.0 | Vridhachalam |
| 7 | TMV 7 | - | 2.0 | Tindivanam |
| **SUNFLOWER** | | | | |
| 1 | CSFH 15020 | 7.5 | 7.5 | Coimbatore |
| 2 | Sunbred 275 | 7.5 | 7.5 | Coimbatore |
| 3 | COH 3 | 7.5 | 7.5 | Coimbatore |
| 4 | CSFH 15026 (R) | 0.6 | 0.6 | Coimbatore |
| 5 | CSFH 14608 (R) | 0.6 | 0.6 | Coimbatore |
| 6 | CSFH 14638 (R) | 0.6 | 0.6 | Coimbatore |
| 7 | CSFH 16510 (R) | 0.6 | 0.6 | Coimbatore |
| 8 | CSFH 17078 (N) | - | 0.6 | Coimbatore |
| 9 | Sunbred 275 | 0.6 | 0.6 | Coimbatore |
| 10 | Hybrid CO 2 | 0.6 | 0.6 | Coimbatore |
| 11 | COH 3 | 0.6 | 0.6 | Coimbatore |
| **CASTOR** | | | | |
| 1 | YRCH 16007 (R) | 1.0 | - | Yethapur |
| 2 | YRCH 16108 (N) | 1.0 | - | Yethapur |
| 3 | YRCH 1 | 1.0 | - | Yethapur |
| 4 | YRCH 2 | 1.0 | - | Yethapur |

## B. Research Projects on Oilseeds

| Centres | University sub-projects | AICRP projects | Externally funded projects | Total | No. of scientists |
|---|---|---|---|---|---|
| **GROUNDNUT** | | | | | |
| Vridhachalam | 3 | 1 | - | 4 | 1 |
| Tindivanam | 3 | 1 | - | 4 | 1 |
| Coimbatore | 1 | - | - | 1 | 1 |
| Kudimiyanmalai | 1 | - | - | 1 | 1 |
| Bhavanisagar | 2 | - | - | 2 | 1 |
| Pattukottai | 1 | - | - | 1 | 1 |
| CPMB, Coimbatore | 1 | - | - | 1 | 1 |
| Sub Total | 12 | 2 | - | 14 | 7 |
| **SESAME** | | | | | |
| Vridhachalam | 2 | 1 | - | 3 | 1 |
| Madurai | 1 | - | 1 | 2 | 1 |
| Bhavanisagar | 1 | - | - | 1 | 1 |
| Coimbatore | 1 | - | - | 1 | 1 |
| CPMB, Coimbatore | 1 | - | - | 1 | 2 |
| Sub Total | 6 | 1 | 1 | 8 | 6 |
| **SUNFLOWER** | | | | | |
| Coimbatore | 2 | 1 | 1 | 4 | 1 |
| Sub Total | 2 | 1 | 1 | 4 | 1 |
| **CASTOR** | | | | | |
| Yethapur | 2 | 1 | - | 3 | 2 |
| Sub Total | 2 | 1 | - | 3 | 2 |
| **Grand Total** | **22** | **5** | **2** | **29** | **16** |

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

| No. | Project No. and Title | Project leaders | Duration | Remarks |
|---|---|---|---|---|
| | **C1. University Research Projects (URPs)** | | | |
| **Groundnut** | | | | |
| **1.** | **CPBG/VRI/PBG/GNT/2015/005** Collection, conservation and evaluation of genetic resources of groundnut (*Arachis hypogaea* L.) | Dr. A. Mothilal, Professor (PB&G) and Head | December 2015 to November 2020 | The Project may be closed. New project may be proposed for three years period. |
| **2.** | **CPBG/VRI/PBG/GNT/2016/001** Breeder seed production of high yielding groundnut varieties released from Regional Research Station, Vridhachalam | Dr. A. Mothilal, Professor (PB&G) and Head | August 2016 to July 2021 | The Project may be closed. New project may be proposed for three years period. |
| **3.** | **CPBG/VRI/PBG/GNT/2012/003** Breeding of improved Spanish Bunch / Virginia Bunch cultivar with inbuilt resistance / tolerance to foliar fungal disease and drought | Dr. A. Mothilal, Professor (PB&G) and Head | January 2012 to December 2016 | The Project may be closed and the completion report should be submitted. INS 2017-1 may critically be evaluated and MLT/ ART cultures may be multiplied and maintained in yield trial |
| **4.** | CPBG/TVM/PBG/OIL/2018/001 Maintenance Breeding and Breeder Seed Production of groundnut Sesame, Castor and Pulses varieties released from TNAU | Dr. M. Vaithiyalingan, Assistant Professor (PB&G) | September 2018 to August 2021 | Project leader may be changed. Project may be continued and the target may be achieved without any shortfall |

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| **5.** | CPBG/ TVM/PBG/GNT/2018/001 Evolution of bunch groundnut varieties tolerant to early stage drought situations | Dr. M. Vaithiyalingan, Assistant Professor (PB&G) | June 2018-May 2023 | In RYT more number of entries can be included and drought resistance may be confirmed. |
| **6.** | CPBG/TMV/PBG/GNT/2015/003 Development of high yielding bold seeded groundnut variety suitable for confectionery purposes | Dr. M. Vaithiyalingan, Assistant Professor(PB&G) | Jan. 2015 to Dec. 2018 | HOVT entries seeds can be shared with other centres |
| **7.** | CPBG/CBE/PBG/GNT/2018/001 Development of high yielding foliar disease resistant groundnut varieties better then CO7 | Dr.PL.Viswanathan, Professor (PB&G) and Head | (October 2015 to September 2020) | Number of crosses may be reduced and specific donors can be used in crossing programme. |
| **8** | CPBG/KDM/PBG/GNT/2017/001 Breeder seed production in groundnut and pulses | Dr. P.Shanthi, Assistant Professor (PB&G) | November 2017 to September 2020 | Project may be continued and the target may be achieved without any shortfall |
| **9** | CPBG/BSR/PBG/GNT/2015/002 Evolving Spanish bunch groundnut (*Arachishypogaea* L.) genotypes with superior yield and evaluation of pre-release cultures of oilseed crops under MLT | Dr.B.Meena Kumari, Asst. Professor (PB&G) | Sep 2015 - Aug 2018 | Concentrate on the popularisation of BSR 2. SPS is not necessary in $F_5$ generation. |
| **10** | CPBG/BSR/PBG/GNT/2017/001 Breeder seed production in ruling varieties of groundnut in Tamil Nadu | Dr.B.Meena Kumari, Asst. Professor (PB&G) | July 2017 – June 2020 | Project may be continued and the target may be achieved without any shortfall |
| **11** | CPBG/PKT/PBG/BGR/2016/001 Breeder Seed Production in Pulses and Groundnut | Dr. A. Bharathi, Asst. Professor (PB&G) | April 2016 to March 2021 | Project may be continued and the target may be achieved without any shortfall |

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|---|---|---|---|---|
| **Sesame** | | | | |
| **12** | **CPBG/VRI/PBG/SES/2016/001**<br>Production of genetically pure nucleus and breeder seed of sesame varieties released from Vridhachalam | Dr. T.Ezhilarasi,<br>Assistant Professor (PB&G) | (June 2016 to May 2021) | Project leader may be changed. Project may be continued and the target may be achieved without any shortfall |
| **13** | **CPBG/VRI/PBG/SES/2019/001**<br>Evolution of high yielding sesame varieties with resistance to *Macrophomina* root rot | Dr. T.Ezhilarasi,<br>Assistant Professor (PB&G)<br>Dr.B.Meena,<br>Associate Professor (Plant Pathology) | (September 2018 to August 2023) | Project leader may be changed. Wild species derivatives from Coimbatore may be shared with TMV. Yield, root rot resistance and oil content of VS 16 004, VS 16 008 and VS 16 009 may be critically assessed. |
| **14** | **CPBG/MDU/PBG/SES/2015/001**<br>–Development of short duration high yielding white seeded sesame (*Sesamum indicum* L.) variety suitable for Southern districts of Tamil Nadu | Dr. C. Parameswari,<br>Asst. Professor (PB&G) | (October 2015 to September 2018) | Rajeshwari seed may be shared with vridhachalam and Coimbatore centres. |
| **15** | **CPBG/BSR/PBG/SES/2017/ 001**<br>Development of white seeded sesame genotypes suitable for western zone of Tamil Nadu. | Dr.B.Meena Kumari,<br>Asst. Professor (PB&G) | (July 2017 – June 2020) | Project may be closed and materials may be transferred to Coimbatore centre. |
| **16** | **CPMB/CBE/BIC/SES/2018/ CP002**<br>Lignan diversity analysis in sesame genotypes for identification of elite sesame lines | Dr. D. Uma, Professor and Head,<br>Department of Biochemistry | (October 2018 to Sept 2020) | Lignan content may be quantified for the TNAU released varieties |

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| **Sunflower** | | | | |
| **17** | **CPBG/CBE/PBG/SNF/2015/004:** Evolution of high yielding sunflower hybrids | Dr. S. Manonmani, Professor (PB&G) | June 2015 to May 2020 | Project may be transferred to Dr. R. Sasikala, AP. |
| **18** | New Project Collection, Maintenance and Evaluation of Germplasm in Sunflower | Dr. R. Sasikala, Assistant Professor (PB&G) | January 2018 to December 2020 | Evaluated germplasm may be deposited to PGR |
| **Castor** | | | | |
| **19** | **CPBG/YTP/PBG/CAS/2015/001** Collection, Conservation, Evaluation, Characterization and Utilization of Castor Germplasm | Dr. P.Arutchenthil, Assistant Professor (PB&G) | July 2015 to June 2020 | Promising trait based lines identified may be utilised in crossing programme. |
| **C2. AICRPs** | | | | |
| **Groundnut** | | | | |
| **20.** | **AICRP/PBG/VRI/GNT/017** All India Evaluation of advanced breeding lines belonging to Spanish / Virginia bunch group through co-ordinated experiments. | Dr. A. Mothilal, Professor (PB&G) | Continuous | Project may be continued |
| **21.** | AICRP/PBG/TVM/GNT/019 AICRP – Oilseeds Groundnut ORS, Tindivanam | Dr.M.Vaithiyalingan, Assistant Professor (PB&G) | Continuous | Project leader may be changed. High oil content varietal trial seeds may be shared with other centers. |

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|---|---|---|---|---|
| **Sesame** | | | | |
| **22** | **AICRP/PBG/VRI/SES/021**<br>All India Coordinated Research Project on Sesame | Dr.T.Ezhilarasi, Assistant Professor (PB&G) | Continuous | Project leader may be changed. Project may be continued. |
| **Sunflower** | | | | |
| **23.** | **AICRP/PBG/CBE/SUN/020**<br>AICRP on Oilseeds (Sunflower) | Dr.R.Sasikala,<br>Asst. Professor (PBG) | Continuous | Project may be continued |
| **Castor** | | | | |
| **24.** | **AICRP/PBG/YPR/CAS/022**<br>All India Coordinated Research Project on castor – Breeding | Dr.S.R.Venkatachalam,<br>Professor (PB&G)<br>Dr.P.Arutchenthil,<br>Assistant professor (PB&G) | Continuous | Project may be continued |
| **C3. External Funded Schemes** | | | | |
| **25.** | **BRNS/CPBG/MDU/SES/2018/R003-**Development of Early Maturing Determinate White Seeded Sesame (*Sesamum indicum* L.) through gamma irradiation | Dr. C. Parameswari Assistant Professor (PB&G)<br>**CO – PI**<br>Dr. C. Vanniarajan, Professor (PB&G) and Head | 2018-2021 | Project may be continued |

| | | | | |
|---|---|---|---|---|
| **26.** | **DBT/CPBG/CBE/OIL/2017/R008** Development of high oleic hybrid through marker assisted backcross approach in sunflower (*Helianthus annuus* (L.)) | Dr. Ameena Premnath, Early Career Scientist (DBT Bio-CARe)<br>**CO – PI**<br>Dr. N. Manivannan (Mentor), Professor (PB&G) & Head | (July 2017 to July 2020) | Project may be continued |
| **C4. Core Projects** | | | | |
| **27.** | **CPBG/CBE/PBG/SES/2018/CP12 2** Development of high yielding early maturing black seeded sesame genotype better than CO1 variety | Dr. S. Manonmani, Professor (PB&G) | (April 2018-March 2021) | Project may be continued |
| **28.** | **CPBG/YTP/PBG/CAS/2018/ CP052** Development of superior castor hybrids with improved plant type and wilt resistance. | Dr. S. R. Venkatachalam, Professor(PB&G) & Head | (April 2018 to March 2019) | Promising hybrids indentified maybe critically evaluated for wilt resistance in wilt sick plots. |

## D. Action Plan (2019 – 2022)

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

| **Theme No 1** | **Identification of high yielding, early duration (90-95 days) groundnut variety** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr. A. Mothilal, Professor (PBG) and Head, RRS, Vridhachalam** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Vridhachalam**<br>Dr. A. Mothilal,<br>**Coimbatore**<br>Dr.PL.Viswanathan,<br>**Bhavanisagar**<br>Dr.B.Meena Kumari<br>**Tindivanam**<br>Dr.Kanchanarani,<br>**Vazhavachanur**<br>Dr. M. Vaithiyalingan,<br>**Aliyarnagar**<br>Dr. C. Ushamalini<br>**CPMB, Coimbatore**<br>Dr. D. Uma, | (i) Seed multiplication at VRI & confirmation of earliness at VRI, CBE, YTP, MDU, BSR, VVR & TMV.<br>(ii) Field screening at ALR (June-July) | MLT – II (June-July) Nomination of promising entries for evaluation under AICRP. Oil quality analysis | OFT / ART (June-July) | Release of early duration (90-95 days) groundnut variety |
| | MLT – I (Dec.-Jan) & Artificial screening for LLS & Rust resistance | Seed multiplication of shortlisted entry | Submission of variety release proposal (Oct – Nov.) | |

**Multilocation Trial – Groundnut (Short duration)**

| | | | |
|---|---|---|---|
| Design : RBD | No. of replications | : | Three |
| Plot size : 4 × 3 $m^2$ | Seed Quantity | : | 1.5 kg/entry/location |
| Spacing : 30 x 10 cm | Season | : | *Kharif* and *Rabi*/ Summer |

| S. No. | Culture | Parentage | Pod yield (kg/ha) | Duration (days) | Special features |
|---|---|---|---|---|---|
| 1 | VG 13110 | R 2001-2 x VRI 3 | 3137 | 95 | Early maturity |
| 2 | VG 13113 | R 2001-2 x VRI 3 | 2352 | 95 | Early maturity |
| 3 | VG 17018 | VRI 3 x IVK 2013-16 | 3217 | 95 | Early maturity |
| 4 | VG 17019 | VRI 3 x IVK 2013-16 | 3316 | 95 | Early maturity |
| 5 | VG 17022 | VRI 3 x IVK 2013-16 | 3226 | 95 | Early maturity |
| 6 | VG 17023 | VRI 3 x IVK 2013-16 | 3241 | 95 | Early maturity |
| Check | | VRI 3, VRI6 | | | |
| Locations (06) | | Vridhachalam, Coimbatore, Bhavanisagar, Tindivanam, Vazhavachanur, Aliyar Nagar | | | |

**Note:**

- Artificial screening for LLS & Rust resistance will be carried out by RRS, Vridhachalam
- Oil quality analysis will be carried out at Department of Biochemistry
- Date of despatch of seed materials to the Lead Centre: May 30$^{th}$
- Expected date of sowing: Second fortnight of December 2019 and first fortnight of June 2020
- Sowing report should be submitted to the P&H, RRS, Vridhachalam with a copy to the DCPBG, CBE

<table>
<tr><td>Theme No 2</td><td colspan="4">Farmers participatory selection of semi spreading groundnut cultures under farmers holdings in Dharmapuri, Salem, Erode, Namakkal and Perambalur districts</td></tr>
<tr><td>Theme Leader</td><td colspan="4">Dr. A. Mothilal, Professor (PBG) and Head, RRS, Vridhachalam</td></tr>
<tr><td>Name of the scientists and centre</td><td>2019-20</td><td>2020-21</td><td>2021-22</td><td>Deliverables /expected out come</td></tr>
<tr><td rowspan="2">Vridhachalam<br>Dr. A. Mothilal,<br>Coimbatore<br>Dr.PL.Viswanathan,<br>Bhavanisagar<br>Dr.B.MeenaKumari<br>Yethapur<br>Dr.S.R.Venkatachalam,<br>Aliyarnagar<br>Dr.C. Ushamalini<br>Paiyur<br>MYRDA KVK and<br>KVK, Perambalur</td><td>FPVS of cultures viz., VG 16024, ICGV 07245, ICGV 07247, COG 0549 Checks: VRI Gn 7, ICGV 00348, CO 6 at Dharmapuri, Salem, Namakkal, Erode and Perambalur districts and natural screening at ALR (June-July)</td><td>MLT / OFT (June-July)<br>Nomination of cultures for evaluation under AICRP<br>Field and artificial screening for LLS & Rust disease resistance</td><td>OFT / ART / Seed multiplication of promising entries<br>Oil quality analysis<br>Field and artificial screening for LLS & Rust disease resistance.</td><td rowspan="2">Release of semi spreading groundnut variety for Dharmapuri, Salem, Erode, Namakkal and Perambalur districts</td></tr>
<tr><td>Seed multiplication of promising entries (Dec-Jan)</td><td>Seed multiplication of promising entries</td><td>Submission of variety release proposal</td></tr>
</table>

**Multilocation Trial – Groundnut (Medium duration)**

| | | | |
|---|---|---|---|
| Design : RBD | No. of replications | : | Three |
| Plot size : 4 × 3 $m^2$ | Seed Quantity | : | 2.0 kg/entry/location |
| Spacing : 30 x 10 cm | Season | : | *Kharif* |

| S. No. | Culture | Parentage | Pod yield (kg/ha) | Duration (days) | Special features |
|---|---|---|---|---|---|
| 1 | VG 16024 | VRI 2 x VRI Gn 7 | 3265 | 125-130 | Drought tolerant, |
| 2 | ICGV 07245 | [(ICGV 92069 x ICGV 93184)SIL 4 x (ICGS 44 x ICGS 76)] | 2780 | 120-125 | Drought tolerant, FDR |
| 3 | ICGV 07247 | [(ICGV 92069 x ICGV 93184)SIL 4 x (ICGS 44 x ICGS 76)] | 2825 | 120-125 | Drought tolerant, FDR |
| 4 | COG 0549 | TMV Gn 13 x ICGV 00203 | 3028 | 130 | Drought tolerant, FDR |
| Checks | | VRI Gn 7, ICGV 00348, CO 6 | | | |
| Locations (08) | | Vridhachalam, Coimbatore, Bhavanisagar, Yethapur, Aliyar Nagar, Paiyur, MYRDA KVK and KVK, Perambalur | | | |

**Note:**

- Artificial screening for LLS & Rust resistance will be carried out by RRS, Vridhachalam and Dept. of Oilseeds, Coimbatore
- Oil quality analysis will be carried out at Department of Biochemistry
- Date of despatch of seed materials to Vridhachalam: June first week 2019
- Expected date of sowing: First fortnight of June
- Sowing report should be submitted to the P&H, RRS, Vridhachalam with a copy to the DCPBG, CBE

| **Theme No 3** | **Development of high yielding groundnut genetic stocks with resistance to foliar diseases** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr. A. Mothilal, Professor (PBG) and Head, RRS, Vridhachalam** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Vridhachalam**<br>Dr. A. Mothilal,<br>**Coimbatore**<br>Dr.PL.Viswanathan,<br>**Tindivanam**<br>Dr. Kanchanarani,<br>**Aliyarnagar**<br>Dr.C. Ushamalini | Hybridization:<br>TMV 7 x VRI 6 [CBE];<br>VRI 2 x VRI 6 [VRI]<br>and TMV 2 x VRI 6 [TMV] | Screening of $F_2$ population for resistance against LLS & rust diseases under natural conditions at CRS, Aliyarnagar. | Sharing of $F_4$ material and evaluation at Vridhachalam, Tindivanam and Coimbatore. | Development of groundnut genetic stocks with high yield and resistance to foliar diseases |
| | Fixing of $F_1$<br>and development of $F_2$ | Evaluation of $F_3$ at RRS, Vridhachalam. | Observational trial at Vridhachalam, Tindivanam and Coimbatore | |

| **Theme No 4** | **Development of pre-breeding lines of groundnut** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr. A. Mothilal, Professor (PBG) and Head, RRS, Vridhachalam** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Vridhachalam**<br>Dr. A. Mothilal, | Hybridization VRI6 x *A.monticola* (for thin shell)<br>VRI6x *Arachis spp*. (stem rot/ collar rot) | Raising $F_2$ (SSD), RRS, Vridhachalam | Raising $F_4$ (SSD) RRS, Vridhachalam. | Development of groundnut genetic stocks |
| | Making double cross and development of $F_2$ | Raising $F_3$ (SSD) RRS, Vridhachalam. | Raising $F_5$ (SSD) RRS, Vridhachalam. | |

| **Theme No 5** | **Evolution of high yielding, monostem / shy branching sesame varieties** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr. A. Mahalingam, Asst. Professor (PBG), RRS, Vridhachalam** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Vridhachalam**<br>Dr. A. Mahalingam,<br>Dr.C.Harisudhan<br>**Coimbatore**<br>Dr. PL.Viswanathan,<br>Dr. R.Sasikala<br>Dr. T.Selvakumar<br>**Madurai**<br>Dr. C. Parameswari<br>**Bhavanisagar**<br>Dr.B.MeenaKumari<br>**Srivilliputur**<br>Dr. K. Thiyagu<br>**Thindivanam**<br>Dr. Kanchanarani | Confirmation of mono stem / shy branching nature of genotypes (VRI, TMV, CBE, MDU, BSR & SVPR) and Seed multiplication of monostem / shy branching genotypes (COS 14017, COS 14018, VS 19036) | Seed multiplication of promising entry | Seed multiplication of promising entries | Release of high yielding, monostem / shy branching sesame varieties |
| | Evaluation under MLT & Spacing trials by Agronomist. (Vridhachalam and Coimbatore) | OFT / ART (Dec - Jan)<br>OFT / ART (March - April) | Submission of proposal for release | |

## Multilocation Trial- Sesame-monostem / shy branching

| **S. No.** | **Culture** | **Parentage** | **Grain yield (kg/ha)** | **Duration (days)** | **Special features** |
|---|---|---|---|---|---|
| 1 | COS 14017 | Mutant of TMV 4 | 981 | 75 | Monostem, white seed coat |
| 2 | COS 14018 | Mutant of TMV 4 | 977 | 75 | Monostem, white seed coat |
| 3 | VS 19036 | VRI 3 x EC 370840 | 950 | 80 | Monostem, white seed coat |
| Check | | VRI 3 and TMV 7 | | | |
| Locations (06) | | Vridhachalam, Bhavanisagar, Coimbatore, Madurai, Sriviliputhur and Tindivanam | | | |

**Note:**

- Date of despatch: 1st week of December for Rabi and 2nd week of March for Summer
- Expected date of sowing: 2nd week of December for Rabi and 3rd week of March for Summer
- Sowing report should be submitted to the P&H, RRS, Vridhachalam with a copy to the DCPBG, CBE

| **Theme No 6** | **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** | **2021-22** | **Deliverables/expected out come** |
| **Coimbatore**<br>Dr. R. Sasikala,<br>Asst. Professor (PBG) | Hybridization of promising maintainers with high oleic donor COSF6B x HO 5-29 &<br>COSF12B x HO 5-29 | $BC_1F_1$ evaluation and generation of $BC_2F_1$ | $BC_3F_1$ evaluation | Identification high oleic maintainer lines |
| | Development of $BC_1F_1$ | $BC_2F_1$ evaluation and generation of $BC_3F_1$ | Evaluation of $BC_3F_2$ and identification high oleic maintainer lines | |

**Note:**

- Sowing report should be submitted to the P&H, Dept. of Oilseeds, TNAU, Coimbatore with a copy to the DCPBG, CBE

| **Theme No 7** | **Development of high yielding hybrids in sunflower with resistance to powdery mildew and alterneria leaf spot** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr. R. Sasikala, Asst. Professor (PBG), Dept. of Oilseeds, Coimbatore** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Coimbatore**<br>Dr.PL.Viswanathan<br>Dr. R. Sasikala<br>Dr.L.Rajendran | Confirmation of F5 RILs(IR6xCSFI13022) and IR6xCSFI13023) for powdery mildew and alterneria under artificial screening | $F_1$ evaluation under PHYT | $F_1$ evaluation under AHYT-2 | Identification high yielding hybrids with disease resistance |
| | Hybridization<br>COSF7A and COSF12A with promising RILs | $F_1$ evaluation under AHY1 | Propose promising hybrids for MLT | |

**Note:**

- Sowing report should be submitted to the P&H, Dept. of Oilseeds, TNAU, Coimbatore with a copy to the DCPBG, CBE

| **Theme No 8** | **Genetic enhancement and reconstitution of promising castor parental lines for the development of superior castor hybrids with wilt resistance** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr.S.R.Venkatachalam, Professor (PB&G) and Head, TCRS, Yethapur** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Yethapur**<br>Dr.S.R.Venkatachalam<br>Professor (PB&G) and Head<br>Dr.P.Arutchenthil,<br>Assistant professor (PB&G)<br>Dr. M. Deivamani,<br>Asst. Prof.(Patho) | Existing intrinsic variability for wilt resistance available in parental inbred lines (Pistillate and monoecious) will be subjected for selection in wilt sick plot | Evaluation of selected wilt resistant individual plants in progeny row trial | Confirmation of wilt resistance for selected lines and generation of superior hybrids for further evaluation | Identification of wilt resistant lines for the development of heterotic castor hybrids |

**Note:**

- Sowing report should be submitted to the P&H, TCRS, Yethapur with a copy to the DCPBG, CBE

| **Theme No 9** | **Unlocking Native Genetic Diversity and Population Structure in Castor** | | | |
|---|---|---|---|---|
| **Theme Leader** | **Dr. M. Raveendran, Professor (Biotech), CPMB, Coimbatore** | | | |
| **Name of the scientists and centre** | **2019-20** | **2020-21** | **2021-22** | **Deliverables/expected out come** |
| **Yethapur**<br>Dr.S.R.Venkatachalam,<br>Professor (PB&G) and Head<br>Dr. S. Rajesh, Asst. Prof.(Biotech)] | Assembling diverse panel of castor lines at TCRS, Yethapur | Diversity analysis using DNA markers at CPMB | Population Structure Analysis and construction of AM Panel at CPMB | Identification of genetic marker associated with the trait of interest. |

**Note:**

- Report should be submitted to the P&H, TCRS, Yethapur with a copy to the DCPBG, CBE

**-*-**

# II. CROP MANAGEMENT

## A. Decisions made on Adoption / OFT

### A1. Technology for adoption

### 1. Sulphur Fertilisation for groundnut calcareous and low sulphur soil

Application of 60 kg sulphur /ha as elemental sulphur along with STCR-IPNS recommendations in calcareous and sulphur deficient soil recorded higher pod yield of 2666 kg $ha^{-1}$, oil content of 48.2% and protein content of 25.0 % with benefit - cost ratio of 2.70 in Groundnut. Therefore, this package can be recommended for groundnut in calcareous and sulphur deficient soils.

### 2. Groundnut genotypes for higher iron efficiency in calcareous soils

Screening of groundnut genotypes for lime induced Fe chlorosis in calcareous soils revealed that the genotypes CO7, CO 2 and ALR 3 were found Fe efficient genotypes hence can be grown under calcareous soils while the genotypes CO 4, ALR 2 and ALG 320 were highly susceptible to Fe deficiency. The genotypes VRI 8, TMV 13, ALR 1 and ALR 2 were found moderately efficient to Fe chlorosis.

### 3. Seed pelleting and foliar nutrition for yield maximization in sesame (summer irrigated)

Seed pelleting with neem leaf powder @ 760 g + 120 g *Azotobacter* + 120 g phosphobacteria for 1 kg seed with 1.5 % combined nutrient spray at 30 & 45 DAS recorded higher sesame seed yield of 803 kg $ha^{-1}$ which is 30 % yield increase over control (615 kg $ha^{-1}$) and higher B:C ratio of 2.85 as against control with 2.37.

### 4. Organic production package for white seeded confectionery sesame

Application of FYM @ 12.5 t/ha + seed treatment (*Azospirillum* + Phosphobacteria + PGPR each @ 600 g $ha^{-1}$ of seed) + soil application of biofertilizer (*Azospirillum* + Phosphobacteria + PGPR each @ 2 kg $ha^{-1}$) and foliar application of panchagavya 3% spray at 30 and 45 DAS recorded a higher seed yield (819 kg $ha^{-1}$) and higher net income (Rs.31,402 /ha) and B:C ratio (1.98).

**5. Altering crop geometry to suit mechanized weeding in sunflower**

Pre emergence application of Pendimethalin @ 1 kg a.i $ha^{-1}$ + power weeding at 30 DAS with an altered spacing of 75 x 25 cm recorded significantly higher yield (1950 kg $ha^{-1}$) and BCR (1.75).

**6. Castor as intercrop in Samai based cropping system in hilly areas of Tamil Nadu**

Samai + Castor (10:1) with 50% of N through organic (FYM @ 8.0 t $ha^{-1}$) + 50% inorganic N (22 kg N through Urea) recorded higher samai equivalent yield of 1790 kg $ha^{-1}$ and found profitable cropping system for hilly area with higher net return of Rs.38,743/ha and B:C ratio of 2.62.

**7. Nipping of primary shoot on growth and yield of perennial castor (YTP 1) under irrigated condition**

Nipping of primary shoot at $10^{th}$ node of perennial castor YTP 1 under irrigated condition recorded higher mean seed yield of 1990 kg/ha as compared to without nipping practices (1583 kg $ha^{-1}$).

**A2. Technologies for information**

**1. Integrated Weed Management in groundnut**

In groundnut, pre-emergence application of Pendimethalin 30 EC + Imazethapyr 2 EC @ 1.0 kg a.i. $ha^{-1}$ (Ready Mix) on 3 DAS followed by one manual weeding at 25-30 DAS recorded more weed control efficiency (67.37 %), higher pod yield (2400 kg $ha^{-1}$) with net return of Rs. 62851/ha and BCR of 1.91

**2. Zinc Efficient Cultivars of Groundnut for Low Zinc Soils**

The genotypes *viz*., CO7, ALR 3, TMV 7, TMV 13, JL 24 and ABHAYA are found to be zinc efficient cultivars with high Zn translocation efficiency

**3. Evaluation of performance of single pods**

Sowing of single pods after soaking in water for 20 hrs performed on par with kernel sowing with respect to growth and yield parameters *viz.,* days to emergence, initial flowering, pegging, no. of seeds/plant and seed yield.

**4. Development of salt tolerant rhizobia for plant growth promotion and yield of groundnut in saline soils**

Molecular characterization revealed that groundnut nodule possessed three rhizobial spp. such as *Rhizobium phaseoli*, *Rhizobium pusense* and *Rhizobium mayense*. Non-rhizobial endophytes like *Dyella*, *Burkholderia*, *Enterobacter*, *Bacillus*, *Brevi bacillus*, *Klebsiella*, *Massilia* and *Inquilinus* were also present in nodules and considered as helpher bacteria for nodulation. Isolated rhizobial and non rhizobial endophytes possessed multiple plant growth promoting traits such as IAA, siderophore, phosphate, silicate and zinc solubilziation.

**5. Permanent Manurial Experiment (PME) on Rainfed Groundnut and Cold weather Gingelly**

Application of 100 % NPK + FYM @ 12.5 t/ha increased 14.8 % pod yield in groundnut and 25.1% in sesame yield over 100% NPK

Application of 100% N + Enriched FYM (750 kg $ha^{-1}$) with recommended P and K was equally effective in influencing groundnut and sesame yield.

Soil organic C build-up from 2.9 g $kg^{-1}$ to 3.8 g $kg^{-1}$ under 100 % NPK (10:10:45) + FYM @ 12.5 t $ha^{-1}$ over 25 years time period.

Imbalanced fertilization depleted nutrients from soil.

**A3. For On Farm Trial (2019-2020)**

**OFT 1. Crop establishment and suitable intercrop for semi-spreading groundnut under rainfed condition**

**Treatments**

$M_1$ - Seed drill sowing with raised bed (120 cm) Groundnut + Cowpea (4:1)
$M_2$ - Seed drill sowing (no land configuration) Groundnut + Redgram (4:1)

**Coordinating Centre :**

**ORS, Tindivanam**

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

**Centres :**

**RRS, Vridhachalam**

Dr.T.Parthipan, Asst. Prof.(Agronomy)

**TCRS, Yethapur**

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

**Observations to be recorded**

Pod yield (kg/ha)
Rainfall use efficiency
Economics

## B. Research Projects on Oilseeds

**CROP WISE**

| S.No | Projects | Groundnut | Sesame | Sunflower | Castor | Total |
|---|---|---|---|---|---|---|
| 1. | University Research Subprojects | 4 | 4 | - | 1 | 9 |
| 2. | AICRP | 12 | 6 | 3 | 4 | 25 |
| 3. | Core Project/ | 4 | 1 | - | - | 5 |
| 4. | External funded | 2 | - | 1 | - | 3 |
| | **Total** | **22** | **11** | **4** | **5** | **42** |
| 5. | Students Research (M.Sc/Ph.D)* | 3 | 1 | - | - | 4 |

(*Not included in the total projects)

**DISCIPLINE WISE**

| S.No | Projects | Groundnut | Sesame | Sunflower | Castor | Total |
|---|---|---|---|---|---|---|
| 1. | Agronomy | 14 | 8 | 3 | 5 | 30 |
| 2. | Soil Science & Agrl. Chemistry | 3 | - | - | - | 3 |
| 3. | Agrl. Microbiology | 1 | 2 | - | - | 3 |
| 4. | Crop Physiology | - | 1 | - | - | 1 |
| 5. | Seed Science & Technology | 4 | - | 1 | - | 5 |
| | **Total** | **22** | **11** | **4** | **5** | **42** |

## C. Ongoing URPs/AICRP/Externally Funded Projects

| Sl. No. | Project No. & Title | Coordinating scientist | Duration | Remarks |
|---|---|---|---|---|
| **ACTION PLAN PROJECTS** | | | | |
| 1. | DCM/TNJ/AGR/GNT/2016/001<br>Oilseeds as a component crop in rice based cropping sequence in canal command area | Dr.M.Babu,<br>Prof. (SS&AC), | June 2016 – May 2019 | • Results given for information<br>• Extension proposal may be submitted for one more year. |
| 2. | DCM/TVM/AGR/GNT/2016/001<br>Crop establishment and suitable intercrop for semi-spreading groundnut under rainfed condition | Dr.K.Sathiya,<br>Asst. Prof. (Agron) | July 2016 - May 2019 | • Rainfall distribution in all seasons and soil nutrient status may be added<br>• The results given OFT |
| 3. | DCM/YTP/AGR/CAS/2016/002<br>Introduction of castor as intercropping in samai in hilly areas | Dr.P.Kathirvelan,<br>Asst. Prof. (Agron.) | June 2016 – May 2019 | • Results may be given for adoption |
| 4. | NRM/CBE/AGM/SES/2016/001<br>Enhancing the productivity and quality of sesame using microbial inoculants. | Dr.R.Brindavathy<br>Assoc. Prof.<br>(Ag.Microbiology) | September 2016 - August 2018 | • The extension proposal may be submitted for approval<br>• The experiment should be conducted with both of nitrogen fixing organisms *viz., Azotobacter* and *Azospirillum.* |
| **GROUNDNUT** | | | | |
| **UNIVERSITY RESEARCH PROJECTS** | | | | |
| **SOIL SCIENCE AND AGRICULTURAL CHEMISTRY** | | | | |
| 5. | NRM/TVM/SAC/GNT/2015/001<br>Permanent Manurial Experiment (PME) on Rainfed Groundnut and Cold weather Gingelly | Dr.P.C. Prabu<br>Asst. Prof (ENS) | July 2015 to June 2020 | • Results given for information<br>• To be continued |

| Sl. No. | Project No. & Title | Coordinating scientist | Duration | Remarks |
|---|---|---|---|---|
| **SEED SCIENCE AND TECHNOLOGY** | | | | |
| 6. | SEED/TMV/SST/GNT/2018/001 Evaluation of single pod sowing | Dr.V.Vijaya Geetha<br>Asst. Prof.(SST ) | Jan. 2018 - Dec. 2020 | • The project may be closed. |
| **CORE PROJECTS** | | | | |
| **AGRICULTURAL MICROBIOLOGY** | | | | |
| 7. | NRM/CBE/AGM/STR2018/CP133<br>Development of Salt tolerant rhizobia for plant growth promotion and yield of groundnut in saline soils | Dr.R.Anandham<br>Asst.Prof.(AGM) | April 2018-March 2021 | • Results given for information<br>• To be continued |
| **SEED SCIENCE AND TECHNOLOGY** | | | | |
| 8. | SEC/CBE/SST/GNT/2018/10<br>Understanding the causes of seed dormancy, poor multiplication ratio, seed deterioration and management strategies for improving productivity in groundnut | Dr. R.Jerlin<br>Professor and Head | August 2018 to July 2019 | • The project may be continued. |
| 9. | SEC/CBE/SST/GNT/2018/CP141<br>Studies on fatty acid profile and their influence on seed storability of groundnut varieties | Dr.P.R.Renganayaki<br>Professor (SST) | February 2019 to January 2020 | • The project may be continued. |
| 10. | SEC/CBE/SST/MAZ/2018/CP075<br>Assessing the seed maturity and vigour of groundnut and maize crops using Chlorophyll fluorescence technique | Dr.D.Thirusendura Selvi<br>Asst. Prof. (SST) | 2018-2019 | • The project may be included with additional parameters in consultation with crop physiology and it may be continued. |
| **EXTERNALLY FUNDED PROJECTS** | | | | |
| **SOIL SCIENCE AND AGRICULTURAL CHEMISTRY** | | | | |
| 11. | DST/NRM/CBE/SSAC/2018/R007<br>Screening Iron Efficient Groundnut Genotypes and Assessing Contribution of Microbial Siderophores in | Dr. S. Meena<br>Professor (SS&AC)<br>Dr. S. Karthikeyan | April, 2018 – March, 2021 | • To be continued |

| Sl. No. | Project No. & Title | Coordinating scientist | Duration | Remarks |
|---|---|---|---|---|
| | a Calcareous Soil usingIron -59 Radiotracer | Prof. (Agrl.Micro.), Dept.of Bio Energy, | | |
| 12. | DST / NRM / CBE / SSAC / 2018 / R008GOI -DST: Understanding and exploiting genotypic variation in groundnut for selecting zinc efficient cultivars for soils of low zinc status | Dr.K.Radhika Women Scientist of DST Dr.S.Meena, Professor (SS&AC) Radio Isotope Laboratory, | April, 2018 – March, 2021 | • To be continued |
| **SESAME** | | | | |
| **UNIVERSITY RESEARCH PROJECTS** | | | | |
| **AGRONOMY** | | | | |
| 13. | DCM/VRI/AGR/SES/2014/001: Organic production of confectionary sesame. | Dr. C. Harisudan Asst. Prof. (Agronomy) | June 2014 to May 2019 | • Five years pooled results given for adoption |
| **AGRICULTURAL MICROBIOLOGY** | | | | |
| 14. | NRM/TMV/AGM/SES/2017/001 Effect of biological source of nutrients on growth enhancement, productivity and seed quality of *Sesamum indicum* L. | Dr. R. Brindavathy, Asst. Prof. (AGM) | April 2017-March 2019 | • The total microbial population may be analysed and the project to be closed |
| **CORE PROJECT** | | | | |
| **AGRONOMY** | | | | |
| 15. | DCM/VRI/AGR/SES/2018/CP045 Exploitation of novel tools and technologies for yield maximization in sesame | Dr. C. Harisudan Asst. Prof. (Agronomy) | 2018-19 | • Main plot treatments may be reduced<br>• To be continued. |

| Sl. No. | Project No. & Title | Coordinating scientist | Duration | Remarks |
|---|---|---|---|---|
| **CROP PHYSIOLOGY** | | | | |
| 16. | DCM/CBE/CRP/CSF/2018/CP009<br>Development of Crop specific foliar formulations for yield enhancement in selected crops (rice, redgram, sesame and finger millet) under normal and water deficit environments | Dr. P.Jeyakumar<br>Professor &Head<br>Co- PI<br>Dr.S.Srinivasan,<br>Asst.Prof.(CRP) | 2018-19 | • To be continued. |
| **SUNFLOWER** | | | | |
| **SEED SCIENCE AND TECHNOLOGY** | | | | |
| 17. | **GOI-DUS scheme**<br>PPV/SC/CBE/SST/2003/R001: DUS test centre for Rice and Sunflower under PPV & FR Authority at the Department of Seed Science and Technology, TNAU, Coimbatore | Dr. R. Jerlin<br>Professor & Head<br>Dept. of SS&T | 2004 to 2019 | • The project to be continued. |
| **AICRP Projects** | | | | |
| **GROUNDNUT** | | | | |
| 18. | AICRP/PBG/VRI/GNT/017<br>Improving phosphorus use efficiency in groundnut with microbial cultures. | Dr. T. Parthipan<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • The project to be continued. |
| 19. | AICRP/PBG/VRI/GNT/017<br>Integrated weed management in *Kharif* Groundnut | Dr. T. Parthipan<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • The results given for information<br>• The project to be continued. |
| 20. | AICRP/PBG/VRI/GNT/017<br>Identification of remunerative groundnut based cropping systems under rainfed situation in India | Dr. T. Parthipan<br>Asst.Prof.<br>(Agronomy) | 2018-19 to 2020-21 | • The project to be continued. |

| Sl. No. | Project No. & Title | Coordinating scientist | Duration | Remarks |
|---|---|---|---|---|
| 21. | AICRP/PBG/VRI/GNT/017<br>Effect of foliar application of water soluble fertilizer on growth, yield and nutrient uptake of summer groundnut | Dr. T. Parthipan<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • The project to be continued. |
| 22. | AICRP/PBG/VRI/GNT/017<br>Efficacy of herbicides on weed control in groundnut under rice – groundnut system | Dr. T. Parthipan<br>Asst. Prof. (Agronomy) | 2016-17 to 2018-19 | • Reason for increased dose of herbicide may be given.<br>• The project to be closed. |
| 23. | AICRP/PBG/VRI/GNT/017<br>Agronomic management of *rabi* / summer groundnut under rice – groundnut system | Dr. T. Parthipan<br>Assistant Professor (Agronomy) | 2016-17 to 2018-19 | • Rainfall data should given<br>• The project to be closed |
| 24. | AICRP/PBG/TVM/GNT/019 Improving phosphorus use efficiency in rabi-summer groundnut with microbial cultures. | Dr. K. Sathiya<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • Soil P status should be given<br>• The project to be continued. |
| 25. | AICRP/PBG/TVM/GNT/019<br>Identification of most profitable groundnut based intercropping systems under rainfed situation. | Dr. K. Sathiya<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • The project to be continued. |
| 26. | AICRP/PBG/TVM/GNT/019<br>Integrated weed management in Kharif Groundnut | Dr. K. Sathiya<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • The project to be continued. |
| 27. | AICRP/PBG/TVM/GNT/019<br>Effect of foliar application of water soluble fertilizer on growth, yield & nutrient uptake of summer groundnut | Dr. K. Sathiya<br>Asst. Prof. (Agronomy) | 2018-19 to 2020-21 | • The project to be continued. |
| 28. | AICRP/PBG/TVM/GNT/019<br>Efficacy of herbicides on weed control in groundnut under rice – groundnut system | Dr. K. Sathiya<br>Asst. Prof. (Agronomy) | 2017-18 to 2020-21 | • The project to be continued. |

| | | | | |
|---|---|---|---|---|
| **SESAME** | | | | |
| 29. | AICRP/PBG/TVM/GNT/019<br>Agronomic management of rabi summer groundnut under rice – groundnut system | Dr. K. Sathiya<br>Asst. Prof. (Agronomy) | 2017-18 to 2020-21 | • The project to be continued. |
| 30. | AICRP/PBG/VRI/SES/021<br>Optimization of nutrient requirement for AVT genotypes | Dr. C. Harisudan<br>Asst. Prof (Agron) | 2018-19 | • The project to be closed. |
| 31. | AICRP/PBG/VRI/SES/021<br>Influence of terminal nipping and growth regulator on yield maximization of sesame | Dr. C. Harisudan<br>Asst. Prof (Agron) | June2016 to May2019 | • The results given for information<br>• The project may be continued for one more year. |
| 32. | AICRP/PBG/VRI/SES/021<br>Developing low input production technology for rice fallow sesame | Dr. C. Harisudan<br>Asst. Prof (Agron) | June2016 to May2019 | • The project to be closed. |
| 33. | AICRP/PBG/VRI/SES/021<br>Studies on ferti-fortification on growth & yield of sesame | Dr. C. Harisudan<br>Asst. Prof (Agron) | June2016 to May2019 | • The project to be closed. |
| 34. | AICRP/PBG/VRI/SES/021<br>Studies on productivity of sesame intercropping system | Dr. C. Harisudan<br>Asst. Prof (Agron) | June2016 to May2019 | • The project to be closed. |
| 35. | AICRP/PBG/VRI/SES/021□<br>Evaluation of pre and post emergence herbicides for weed management in sesame | Dr. C. Harisudan<br>Asst. Prof (Agron) | June2016 to May2019 | • The project to be closed. |
| **SUNFLOWER** | | | | |
| 36. | AICRP /PBG /CBE / SUN / 020<br>Introduction of sunflower in emerging cropping system | Dr.T. Selvakumar<br>Asst. Prof (Agron) | 2016 -2019 | • To be continued |

| | | | | |
|---|---|---|---|---|
| 37. | AICRP /PBG /CBE / SUN / 020<br>Response of sunflower to varying planting geometry and fertilizer levels under different land configurations under rainfed conditions | Dr.T. Selvakumar<br>Asst. Prof (Agron) | 2016 -2017 | • The project to be closed. |
| 38. | AICRP /PBG /CBE / SUN / 020<br>Integrated weed management in sunflower under modified spacing | Dr. T. Selvakumar<br>Asst. Prof (Agron) | 2016-2019 | • The project to be closed. |
| **CASTOR** | | | | |
| 39. | AICRP/PBG/YPR/CAS/022<br>Effect of hydrogel on soil moisture and productivity of rainfed castor. | Dr.P.Kathirvelan<br>Asst.Prof (Agron) | 2018-2019 | • The project to be closed. |
| 40. | AICRP/PBG/YTR/CAS/022<br>Yield maximisation of castor through Best Management Practices | Dr.P.Kathirvelan<br>Asst.Prof (Agron) | 2018-2019 | • The project to be closed. |
| 41. | AICRP/PBG/YTR/CAS/022<br>Influence of conservation tillage on carbon sequestration in castor based intercropping systems | Dr.P.Kathirvelan<br>Asst.Prof (Agron) | 2018-2019 | • The project to be closed. |
| 42. | AICRP/PBG/YTR/CAS/022<br>Studies on High Density Planting in *Rabi* Castor | Dr.P.Kathirvelan<br>Asst.Prof (Agron) | 2018-2019 | The project to be closed. |

**D. General Remarks**

Disseminate the role of PPFM spray on oilseed crops under rainfed condition.

**(Action : Dept. of Microbiology, TNAU, Coimbatore)**

**E. ACTION PLAN 2019-2020**

**Action Plan 1**

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

**Objectives:**

- To improve peg penetration, pod development and pod yield of groundnut

**Treatment details**

**Factor A. Green manure**

$M_1$ - Control - groundnut

$M_2$ - Sunnhemp (incorporation at 45 DAS) - groundnut

$M_3$ - Daincha (incorporation at 45 DAS) - groundnut

**Factor B. Fertilizer doses (STCR)**

$S_1$ - Control

$S_2$ - 50 % STCR

$S_3$ - 75 % SRCR

$S_4$ - 100 % STCR

**Season** : Green manure ($2^{nd}$ fortnight of August)- Groundnut (*Rabi irrigated*)

**Design** : Strip plot

**Replication** : Three

**Plot size** : 20 cents

**Centre** : **ORS, Tindivanam**

Dr.K.Sathiya,

Asst. Prof. (Agronomy)

Dr.R.Brindavathy,

Assoc.Prof.(Agrl. Microbiology)

Dr.P.C.Prabu,

Asst. Prof. (Environmental Science)

**Action Plan 2**

Agronomic practices for micro climate modification

**Objective:**

- To study the effect of agronomic practices on microclimate modification

**Treatments :**

**Factor A (Cropping System)**

$C_1$ - Sole Groundnut

$C_2$ - Groundnut (Co 7) + Red gram (VBN 3) 6:1

**Factor B (Irrigation)**

$I_1$ - Rainfed

$I_2$ - Irrigation (sowing, flowering, pegging & pod development)

**Factor C (Sowing windows)** *Kharif – 3 windows*

$S_1$ - 2nd fortnight June

$S_2$ - 1st fortnight July

$S_2$ - 2nd fortnight July

**Design** : FRBD

**Replication** : 3

**Coordinating Centre** :

**ACRC, Coimbatore**

Dr.SP. Ramanathan

Professor and Head

Dr.NK. Sathyamoorthy

Asst. Prof. (Agronomy)

**Centre** :

**ARS, Aliyarnagar**

Dr.S.Rani

Asst. Prof. (Agronomy)

**ARS, Bhavanisagar**

Dr. N. Satheesh Kumar

Asst. Prof. (Agronomy)

**Action Plan 3**

Modifying root architecture for yield enhancement in rainfed sesame

**Rationale:**

- Poor root development due to insufficient soil moisture under rainfed conditions
- Shedding of flowers and shattering of capsules
- Poor translocation efficiency

**Objectives :**

- To improve root biomass under rainfed conditions
- To develop suitable management technology to improve the translocation efficiency and yield

**Treatments**

$T_1$ - Control

$T_2$ - Nipping at 30 DAS

$T_3$ - Chlormequat chloride @ 50 ppm at 30 DAS

$T_4$ - Chlormequat chloride @ 100 ppm at 30 DAS

$T_5$ - Chlormequat chloride @ 150 ppm at 30 DAS

$T_6$ - Mepiquat chloride @ 100 ppm at 30 DAS

$T_7$ - Mepiquat chloride @ 150 ppm at 30 DAS

$T_8$ - Mepiquat chloride @ 200 ppm at 30 DAS

**Design :** RBD
**Replication :** 3
**Season :** Summer

**Parameters to be recorded:**

Root morphological traits, Growth parameters, yield and yield parameters

**Coordinating Centre:**

**Dept. of Crop Physiology, TNAU, Coimbatore**

Dr.S.Srinivasan, Asst. Prof. (Crop Physiology)

**Centres : RRS, Virudhachalam**

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

**ORS, Tindivanam**

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

**Action Plan 4**

Optimizing nipping practices for newly released perennial castor variety YTP 1

**Objectives:**

- To study the effect of nipping frequency for the newly released castor variety YTP 1

**Treatments Details: Nipping primary shoot**

No - Without nipping

$N_1$ - Nipping at $8^{th}$ node

$N_2$ - Nipping at $10^{th}$ node

$N_3$ - Nipping at $12^{th}$ node

*Suitable intercrops may be included during kharif and Rabi (on receipt of sufficient rainfall)

**Spacing** **:** 2 x 2 m

**Design** **:** RBD

**Replication** **:** 5

**Coordinating Centre:**

**TCRS, Yethapur**

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

**Centres :**

**RRS, Vridhachalam**

Dr.C.Harisudan,

Asst. Prof. (Agronomy)

**Dept. of Oilseeds, TNAU, Coimbatore**

Dr.T.Selvakumar,

Asst. Prof. (Agronomy)

**Action Plan 5**

Development of e-Nose sensor for quick detection of seed quality

**Objectives**

- To design and fabricate e-Nose sensor for detecting the viability status of oil seeds

**Technical Details**

- Scanning of VOC profiles in deteriorating seeds
- Design and Fabrication of e-Nose sensor for detecting the volatile organic compounds from deteriorating seeds

**Period :** 2019-20 to 2021-22

**Expected outcome**

- A handy e-Nose based diagnostic kit will be developed to measure the health status of seeds which helps the farmers by ensuring good germination and productivity of the crops
- Seed industries people can take this techniques for commercialization

**Theme Leader :**

Dr. S. Sundareswaran,

Director, Seed Centre

**Centre : Dept. of Seed Science & Technology and**

**Dept. of Nano Science &Technology, TNAU, Coimbatore**

Dr.K.S.Subramanian

Director of Research, TNAU, Coimbatore

Dr.K.Raja,

Assoc. Prof.(SS&T)

**Action Plan 6**

Optimizing Plant geometry and nutrient levels for pre released spanish bunch groundnut cultures

**Objectives**

- To optimize spacing and nutrient levels for pre release groundnut

**Treatments**

**Main plot: Genotypes**

$G_1$: VG 13163 (Medium)

$G_2$: VG 13154 (Bold)

**Sub plot: Plant Geometry**

$D_1$: 30 x 10 cm (3,33,333 plants/ha)

$D_2$: 30 x 15 cm (2,22,222 plants/ha)

$D_3$: 45 x 10 cm (2,22,222 plants/ha)

**Sub sub plot: Nutrient levels**

$N_1$: 100 % STCR

$N_2$: 125 % STCR

$N_3$: 75 % STCR

*TNAU MN mixture and TNAU Groundnut rich is common for all treatments

**Season** : Kharif

**Design** : Strip split plot

**Replication** : Four

**Centre** : **RRS, Vridhachalam**

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

Mrs. G.Porkodi, Asst. Prof. (Soil Science), KVK, Vridhachalam

**Action Plan 7**

Optimizing spacing and nutrient levels for pre release Sunflower hybrid

**Objective**

- To optimize spacing and nutrient levels for pre release Sunflower hybrid (CSFH 150205).

**Treatments**

**Main plot: Density**

$S_1$ : 60 x 35 cm (47,619 plants/ha)

$S_2$ : 60 x 30 cm (55,555 plants/ha)

$S_3$ : 60 x 25 cm (66,666 plants/ha)

**Sub plot: Nutrient levels**

$N_1$ : 120 % STCR

$N_2$ : 110 % STCR

$N_3$ : 100 % STCR

$N_4$ : 90 % STCR

$N_5$ : 80 % STCR

**Design :** Split plot

**Replication :** 3

**Season :** kharif

**Centre: Dept. of Oilseeds, TNAU, Coimbator**e

Dr.T.Selvakumar, Asst.Prof.(Agronomy)

**Dept. of Agronomy**

Dr.A.Renugadevi, Asst.Prof.(SS&AC)

**Action Plan 8**

Optimizing plant population for higher productivity of shy branching sesame

**Objective**

- To determine the optimum inter and intra row spacing and plant density for shy branching sesame productivity

| Treatment : Spacing | Plants/$m^2$ | % Population increase |
|---|---|---|
| $T_1$ : 30 x 30 cm | 11.1 | - |
| $T_2$ : 30 x 15 cm | 22.2 | 100 |
| $T_3$ : 22.5 x 20 cm | 22.2 | 100 |
| $T_4$ : 22.5 x 15cm | 29.6 | 167 |
| $T_5$ : 30 x 10 cm | 33.3 | 200 |
| $T_6$ : 22.5 x 10 cm | 44.4 | 300 |
| $T_7$ : 15 x 15 cm | 44.4 | 300 |
| $T_8$ : 30 x 5 cm | 66.7 | 500 |
| $T_9$ : 15 x 10 cm | 66.7 | 500 |
| $T_{10}$ : 22.5 x 5 cm | 88.9 | 700 |
| $T_{11}$ : 15 x 5cm | 133.3 | 1100 |

**Genotype :**

COS-14018 (Coimbatore)

VS-1936 (RRS, Viridhachalam)

**Design :** RBD

**Replication :** 3

**Season :** Summer

**Centres : Dept. Oilseeds, TNAU, Coimbatore**

Dr.T.Selvakumar, Asst. Prof. (Agronomy)

**RRS, Virudhachalam**

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

# III. CROP PROTECTION

## A. Decisions Made on OFT

### A1. For Adoption

**1. IPM Module for groundnut pest management**

Basal application of neem cake @ 250 kg/ha, seed treatment with imidacloprid 17.8 SL @ 2ml/kg, cumbu as intercrop (6:1) ratio, yellow sticky trap @ 25/ha, release of *Chrysoperla* @ 40000/ha on 20 DAS and Azadirachtin 1% @ 2ml /lit on 30 DAS.

**2. IPM Module for castor pest management**

Application of Btk @ 1g/l (on notice of egg and early instar larvae of semilooper), monitoring of *Spodoptera litura* by pheromone traps @ 5 /acre from 30 DAS, application of flubendiamide 39.35 SC @ 0.2 ml /l (for *Spodoptera* when foliar damage reaches 10%), profenofos 50EC @ 1ml/l (for capsule borer/leafhopper when damage reaches 10%).

### A2. For OFT

**OFT 1: Combination effect of border crop with organic amendment for insect pest management in groundnut**

| S.No | Treatments |
|---|---|
| 1 | Groundnut + Pearl millet + Neem cake (250 kg/ha) |
| 2 | Groundnut + Pearl millet + Vermicompost (2.5 t/ha) |
| 3 | Groundnut + Sorghum + Neem cake (250 kg/ha) |
| 4 | Groundnut + Sorghum + Vermicompost (2.5 t/ha) |
| 5 | Groundnut alone |

Spacing: 30x10cm; Variety: VRI 2; Replication: 4

**Observations to be taken**

1. Population and damage (%) of sucking and chewing insect pests
2. Population of entomophages in main and border crops
3. Pest defender ratio, occurrence ratio, Preference ratio
4. Yield (kg/ha) and CBR

| Centres | Scientists Identified |
|---|---|
| RRS, Vriddhachalam | Dr.P.Indiragandhi, AP(Ento) |
| ORS, Tindivanam | Dr.V.Radhakrishnan, AP(Ento), Vazhavachanur |
| TCRS, Yethapur | Dr. B. Geetha, Associate Professor (Ento) |
| ARS, Virinjipuram | Dr.P.Thilagam, AP(Ento) |

**OFT 2: Evaluation of newer insecticides in Castor against whiteflies and thrips**

**Treatments (2 Sprays at 60, 75 DAS)**

1. Buprofezin 25 SC @ 0.8 ml/l
2. Profenophos 50 EC 1 ml/l
3. Azadirachtin 1% @ 2 ml/l
4. Control

Design : RBD
Replications : 5
Plot Size : 4.5 m x 6.0 m
Spacing : 90 cm x 90 cm
Hybrid : DCH 519

**Observations to be recorded**

1. Thrips (Number/spike) and whitefly (Number /3 leaves / plant) before treatment and 3, 7 and 14 days after each spray.
2. Population of parasitoids and predators
3. Yield data
4. Cost benefit ratio

| Centre | Scientists Identified |
|---|---|
| RRS, Vriddhachalam | Dr.P.Indiragandhi, AP(Ento) |
| ORS, Tindivanam | Dr.V.Radhakrishnan, AP(Ento), Vazhavachanur |
| TCRS, Yethapur,<br>KVK, Santhiyur | Dr. B. Geetha, Associate Professor (Ento) |
| ARS, Virinjipuram | Dr.P.Thilagam, AP(Ento) |

**OFT 3: Integrated disease management in groundnut**

**Treatments**

T1: ST with tebuconazole 1.5 g/kg + furrow application of *T. asperellum* @ 2.5 kg/ha mixed with 50 kg FYM + application of *T. asperellum* @ 2.5 kg/ha mixed with 50 kg FYM at 40 DAS + two spray of tebuconazole @ 1 ml/l at initiation of foliar diseases and 15 days later

T2:ST with mancozeb @ 2g/kg seed + foliar spray of hexaconazole @ 1 ml/lit at 30 and 45 DAS + soil drenching with carbendazim 0.1% during onset of the disease appearance

T3: Control

Design: RBD; Replication: 7; Plot size: 5.0 x 4.0 m; Spacing: 30 x 10 cm; Cultivar: VRI 2

**Observations to be recorded**

1. Disease severity of collar rot, root rot, stem rot, leaf spot and rust
2. Yield (kg/ha) and CBR

Centres: RRS, Vriddhachalam, (Dr.K.Karunanithi)

CRS, Aliyarnagar (Dr.C.Ushamalini)

ORS, Tindivanam (Dr. M. Rajakumar)

DARS, Chettinad (Dr. M. Paramasivam)

## B. Research Projects on Oilseeds

| Crop | Agricultural Entomology | Plant Pathology | Total |
|---|---|---|---|
| **University sub projects** | | | |
| Groundnut | 2 | 4 | 6 |
| Sesame | 1 | 2 | 3 |
| Castor | 1 | - | 1 |
| Sunflower | - | 1 | 1 |
| **AICRP projects** | | | |
| Groundnut | 1 | 1 | 2 |
| Sesame | 1 | 1 | 2 |
| Castor | 1 | 1 | 2 |
| Sunflower | - | 1 | 1 |
| **Total** | **7** | **11** | **18** |

## C. Remarks on the Ongoing URPs/AICRP/Externally Funded Projects

### AGRICULTURAL ENTOMOLOGY

| No. | Project Number and Title | Name and Designation of the Project leader | Duration | Remarks |
|---|---|---|---|---|
| **University Research Project** | | | | |
| **Groundnut** | | | | |
| 1. | CPPS/ENT/GNT/2016/001<br>Cultural Management of insect pests in groundnut | Dr. P. Indiragandhi<br>Assistant Professor (Agrl. Entomology) | 2016 to 2019 | The project outcome may be recommended for OFT. The project may be concluded, the final report may be submitted with the published article on or before 30.06.2019. A new URP may be proposed. |
| 2. | CPPS /ALR/ ENT/ GNT/2015/ 001<br>Screening groundnut breeding materials against insect pests for exploitation of resistance. | Dr. K. Rajamanickam Professor (Agrl. Entomology) | 2015 to 2019 | Many genotypes have been screened but needs clarity for grade or scale? Decoding has to be done for all the entries used. The project may be concluded, the final report may be submitted with the published article. |
| **Sesame** | | | | |
| 3. | CPPS/VRI/ENT/SES/2016/001<br>Introducing eco-feast crops and enhancing soil fertility to improve plant pest natural enemy interactions in sesame | Dr. R. Sheeba Jasmine<br>Assistant Professor (Agrl. Entomology) | 2016 to 2019 | The project may be concluded. The final report may be submitted with analyzed data and published article on or before 30.06.19. A new URP may be proposed. |

| No. | Project Number and Title | Name and Designation of the Project leader | Duration | Remarks |
|---|---|---|---|---|
| | | **Castor** | | |
| 4. | CPPS/YTP/AEN/CAS/2015/001<br>Bio-ecology and management of castor whitefly (*Trialeurodes ricini*) and castor thrips (*Retithrips syriacus*) in rabi castor | Dr. M. Senthilkumar<br>Assistant Professor (Agrl. Entomology) | 2015 to 2018 | The completion report has to be submitted on or before 30.06.2019 with pooled analysis of the data. The outcome of the project may be recommended for the OFT. A copy of the publication (both soft and hard copy) from this URP may be sent to Director (CPPS) for documentation. A new research project proposal should be submitted based on identified theme area. |
| | | **AICRPs** | | |
| | | **Groundnut** | | |
| 1. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut - Report on the insect pests situation in Groundnut crop during *Rabi* Summer 2016-2017 and *Kharif*-2017 | Dr.P.Indiragandhi,<br>Assistant Professor (Entomology) | Continuous | Project may be continued |
| 2. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut - Exercise on role of natural enemies of major insect pest of groundnut | Dr.P.Indiragandhi,<br>Assistant Professor (Entomology) | Continuous | Project may be continued |
| 3. | AICRP/PBG/VRI/GNT/017 | Dr.P.Indiragandhi, | Continuous | Project may be continued |

| No. | Project Number and Title | Name and Designation of the Project leader | Duration | Remarks |
|---|---|---|---|---|
| | AICRP on Groundnut - Monitoring of *Spodoptera litura* using pheromone traps | Assistant Professor (Entomology) | | |
| 4. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut - Screening for resistance to insect pests | Dr.P.Indiragandhi, Assistant Professor (Entomology) | Continuous | Project may be continued |
| 5. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut Evaluation of botanicals against groundnut defoliators | Dr.P.Indiragandhi, Assistant Professor (Entomology) | 2015-2018 | Project may be continued |
| 6. | AICRP/PBG/VRI/GNT/017Validation of storage bags against peanut storage pests and aflatoxin contamination | Dr.P.Indiragandhi, Assistant Professor (Entomology) | 2018-2019 | Project may be continued |
| **Sesame** | | | | |
| 7. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Screening for insect pest resistance | Dr.R.Sheeba Jasmine, Asst Professor (Entomology) | Continuous | Project may be continued |
| 8. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Evaluation of resistance in promising genotypes of sesame through artificial pest load and antibiosis studies | Dr.R.Sheeba Jasmine, Asst Professor (Entomology) | Continuous | Project may be continued |
| 9. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Survey and seasonal incidence of major insects pest of sesame in relation to biotic and abiotic | Dr.R.Sheeba Jasmine, Asst Professor (Entomology) | Continuous | Project may be continued |

| No. | Project Number and Title | Name and Designation of the Project leader | Duration | Remarks |
|---|---|---|---|---|
| | factors | | | |
| 10. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Assessment of yield losses due to leaf roller/capsule borer (*Antigastra catalaunalis*) in promising varieties/ lines of sesame | Dr.R.Sheeba Jasmine,<br>Asst Professor (Entomology) | 2017-18 | Project may be continued |
| **Castor** | | | | |
| 11. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Survey and Monitoring of Castor Insect Pests | Dr.M.Senthil Kumar,<br>Assistant Professor (Entomology) | *Kharif*<br>2017 – 18<br>(August, 2017 to March, 2018) | Project may be continued |
| 12. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Screening of germplasm against sucking pests (leafhopper, thrips and whitefly) | Dr.M.Senthil Kumar,<br>Assistant Professor (Entomology) | *2017-18* | Project may be continued |
| 13. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Confirmation of reaction of promising accessions to leafhopper | Dr.M.Senthil Kumar,<br>Assistant Professor (Entomology) | *Kharif*<br>2017 – 18<br>(August, 2017 to March, 2018) | Project may be continued |
| 14. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Confirmation of reaction of promising accessions to thrips | Dr.M.Senthil Kumar,<br>Assistant Professor (Entomology) | 2017-2018 | Project may be continued |

| No. | Project Number and Title | Name and Designation of the Project leader | Duration | Remarks |
|---|---|---|---|---|
| 15. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Confirmation of reaction of promising germplasm accessions to whitefly | Dr.M.Senthil Kumar, Assistant Professor (Entomology) | August, 2018 to March, 2019 | Project may be continued |
| 16. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Screening of monoecious lines against sucking pests | Dr.M.Senthil Kumar, Assistant Professor (Entomology) | 2017-2018 | Project may be continued |
| 17. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Screening of advanced breeding lines from coordinated varietal/hybrid trials against major castor insect pests. | Dr.M.Senthil Kumar, Assistant Professor (Entomology) | (August, 2018 to March, 2019) | Project may be continued |
| 18. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Evaluation of newer insecticides against whitefly in castor | Dr.M.Senthil Kumar, Assistant Professor (Entomology) | (August, 2018 to March, 2019) | Project may be continued |
| 19. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Pesticide compatibility and efficacy against insect pests and diseases | Dr.M.Senthil Kumar, Assistant Professor (Entomology) | (August, 2018 to March, 2019) | Project may be continued |

## PLANT PATHOLOGY

| No. | Project Number and Title | Name and Designation of the Project leader | Duration | Remarks |
|---|---|---|---|---|
| **University Research Project** | | | | |
| **Groundnut** | | | | |
| 1. | CPPS/TMV/PAT/GNT/2017/New Standardization of dose of *Trichoderma asperellum* and *Pseudomonas fluorescens* for groundnut by different methods of application | Dr. M. Rajakumar Professor (Plant Pathology) and Head | 2017 – 2020 | The project may be closed as there is no uniformity in the treatment dosage and a new URP may be proposed based on the theme area on or before 30.06.2019. |
| 2. | CPPS/ALR/PAT/GNT/2017/001 Identifying the mechanism of resistance in groundnut breeding materials against rust and late leaf spot diseases | Dr. S. Sundravadana Assistant Professor (Plant Pathology) | 2017-2019 | Completion report has to be submitted on or before 30.06.2019. The outcome of the project may be published and a copy of the publication (both soft and hard copy) may be sent to Director (CPPS) for documentation. A new research project proposal should be submitted based on theme area on or before 30.06.2019. |
| 3. | CPPS/VRI/PAT/GNT/2017/001 Management of soil borne diseases of groundnut by using bioinoculants and organic amendments | Dr. G. Senthilraja Assistant Professor (Plant Pathology) | 2017-2020 | The project may be closed as there is no uniformity in the treatment dosage and a new URP may be proposed based on the theme area on or |

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| | | | | before 30.06.2019. |
| 4. | CPPS/CTN/PAT/GNT/2016/001<br>Integrated diseases management of soil borne diseases of groundnut under rainfed conditions | Dr. M. Paramasivan<br>Assistant Professor (Plant Pathology) | 2016-2019 | The project may be continued with the rhizoscanner study for different doses of the bioagents as seed treatment. The data has to be documented for further study. |
| **Sesame** | | | | |
| 5. | CPPS/VRI/PAT/SES/2017/001 Management of root rot (*Macrophomina phaseolina*) disease of sesame (*Sesamum indicum* L.) | Dr. B. Meena<br>Associate Professor (Plant Pathology) | 2017-2019 | The project may be closed and completion report has to be submitted as there is no uniformity in the treatment dosage and a new URP may be proposed based on the theme area on or before 30.06.2019. |
| 6. | CPPS/CBE/PAT/SES/2017/001<br>Effect of liquid formulation of *Pseudomonas fluorescens* and *Bacillus amyloliquefaciens* on the management of leaf blight and charcoal rot of sesame (*Sesamum indicum* L.) | Dr. M. Muthamilan<br>Professor (Plant Pathology) | 2017-2020 | Project may be continued. |
| **Sunflower** | | | | |
| 7. | CPPS/CBE/PAT/SNF/2018/<br>001 Effect of A*mpelomyces quisqualis* on the management of sunflower | Dr. L. Rajendran<br>Professor (Plant Pathology) | 2018-2021 | Project may be continued. For the molecular characterization studies, |

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| | powdery mildew caused by *Golovinomyces Cichoracearum* | | | specific primer has to be used in addition to ITS region amplification for the *Ampelomyces* isolates. |
| **AICRPs** | | | | |
| **Groundnut** | | | | |
| 1. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut Monitoring of major diseases of groundnut | Dr.G.Senthilraja<br>Assistant Professor<br>(Plant Pathology) | Continuous | Project may be continued |
| 2. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut Screening of IVT-I, IVT-II, AVT and other Co-ordinated trial materials for resistance/ tolerance to major diseases | Dr.G.Senthilraja<br>Assistant Professor<br>(Plant Pathology) | Continuous | Project may be continued |
| 3. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut Screening of peanut germplasm for diseases and major pests | Dr.G.Senthilraja<br>Assistant Professor<br>(Plant Pathology) | 2018-19 | Project may be continued |
| 4. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut Management of major foliar diseases using fungicides | Dr.G.Senthilraja<br>Assistant Professor<br>(Plant Pathology) | 2015-18 | Project may be continued |
| 5. | AICRP/PBG/VRI/GNT/017<br>AICRP on Groundnut Validation of management modules for soil borne diseases | Dr.G.Senthilraja<br>Assistant Professor<br>(Plant Pathology) | 2017-2019 | Project may be continued |
| 6. | AICRP/PBG/VRI/GNT/017 | Dr.G.Senthilraja<br>Assistant Professor | 2015-2018 | Project may be continued |

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|---|---|---|---|---|
| | AICRP on Groundnut Evaluation of different IPM modules for management of major insect-pest and diseases in groundnut | (Plant Pathology) | | |
| 7. | AICRP/PBG/ALR/GNT/018<br>AICRP on Oilseeds - Off Season Nursery (Groundnut) Monitoring the major diseases of groundnut | Dr.C.Ushamalini Associate Professor (Plant Pathology) | April 2017 to March 2018 | Project may be continued |
| 8. | AICRP/PBG/ALR/GNT/018<br>AICRP on Oilseeds - Off Season Nursery (Groundnut) Screening of IVT-I & II, AVT and other coordinated trial material for resistance/ tolerance to major diseases | Dr.C.Ushamalini Associate Professor (Plant Pathology) | April 2017 to March 2018 | Project may be continued |
| 9. | AICRP/PBG/ALR/GNT/018<br>AICRP on Oilseeds - Off Season Nursery (Groundnut) Validation of management modules for soil borne diseases | Dr.C.Ushamalini Associate Professor (Plant Pathology) | April 2017 to March 2018 | Project may be continued |
| 10. | AICRP/PBG/ALR/GNT/018<br>AICRP on Oilseeds - Off Season Nursery (Groundnut) Managing of major foliar diseases using fungicides | Dr.C.Ushamalini Associate Professor (Plant Pathology) | April 2017 to March 2018 | Project may be continued |
| **Sesame** | | | | |
| 11. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Survey for sesame diseases | Dr.B.Meena Associate Professor (Plant Pathology) | Continuous | Project may be continued |

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|---|---|---|---|---|
| 12. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Uniform disease nursery and sesame germplasm | Dr.B.Meena<br>Associate Professor<br>(Plant Pathology) | Continuous | Project may be continued |
| 13. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Disease assessment in co-ordinated trials of other disciplines | Dr.B.Meena<br>Associate Professor<br>(Plant Pathology) | Continuous | Project may be continued |
| 14. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Identification of seed mycoflora of sesame | Dr.B.Meena<br>Associate Professor<br>(Plant Pathology) | 2018-2019 | Project may be continued |
| 15. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Integrated management of foliar diseases of sesame | Dr.B.Meena<br>Associate Professor<br>(Plant Pathology) | 2018-2019 | Project may be continued |
| 16. | AICRP/PBG/VRI/SES/021<br>AICRP on Sesame Management of stem and root rot of sesame caused by *Macrophomina phaseolina* | Dr.B.Meena<br>Associate Professor<br>(Plant Pathology) | 2018-2019 | Project may be continued |
| **Sunflower** | | | | |
| 17. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Survey and surveillance of different diseases | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | Continuous | Project may be continued |
| 18. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Screening of entries of coordinated trials (*Kharif* and *Rabi*) | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | Continuous | Project may be continued |

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| 19. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Screening the promising CMS & R lines/NCP material for major diseases under field conditions | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | Continuous | Project may be continued |
| 20. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Evaluation of molecules against viral diseases of sunflower | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | 2016-2019 | Project may be continued |
| 21. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Evaluation of plant defense inducers for the management of diseases of sunflower | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | 2018-2021 | Project may be continued |
| 22. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Management of Alternaria leaf spot using available fungicides (combi products) | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | 2017-2020 | Project may be continued |
| 23. | AICRP/PBG/CBE/SUN/020<br>AICRP on Sunflower Management of sunflower diseases using Plant Growth Promoting Rhizobacteria (PGPR) | Dr. L.Rajendran<br>Assistant Professor<br>(Plant Pathology) | 2017-2020 | Project may be continued |
| **Castor** | | | | |
| 24. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Disease scenario in different agroclimatic regions | Dr.M.Deivamani<br>Assistant Professor<br>(Plant Pathology) | 2018-2019 | Project may be continued |
| 25. | AICRP/PBG/YPR/CAS/022 | Dr.M.Deivamani | 2018-2019 | Project may be continued |

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| | AICRP on Castor Influence of weather parameters on *Botryotinia* gray mold development | Assistant Professor (Plant Pathology) | | |
| 26. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor On-farm demonstration of management of *Botryotinia* gray mold | Dr.M.Deivamani Assistant Professor (Plant Pathology) | 2018-2019 | Project may be continued |
| 27. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor Screening of entries of Coordinated trials against major diseases | Dr.M.Deivamani Assistant Professor (Plant Pathology) | 2018-2019 | Project may be continued |
| 28. | AICRP/PBG/YPR/CAS/022<br>AICRP on Castor On-farm demonstration of Management of wilt and root rot of castor | Dr.M.Deivamani Assistant Professor (Plant Pathology) | 2018-2019 | Project may be continued |

## D. GENERAL REMARKS

- Completion report is to be submitted on or before 30.06.2019. The outcome of the project may be published. A copy of the publication (both soft and hard copy) published from the URP may be sent to Director (CPPS) for documentation. New research project proposal should be submitted based on theme area within 30.06.2019.
- The dates given for sending the closure / deletion reports and change of project leaders should be strictly adhered.
- Inter-disciplinary research projects are encouraged to solve the emerging crop protection problems in oil seed crops (Action: All scientists).
- All microbial bio-inoculants used for plant protection by the scientists should have accession no. assigned by the Professor & Head, Department of Plant Pathology, CPPS, TNAU, Coimbatore.
- All scientists are requested to monitor the status of insect pests and diseases of oilseeds in their respective districts by taking observations in both fixed plot and roving survey.
- Monthly pest and disease surveillance report should be submitted to the Director (CPPS) on or before 25$^{th}$ of every month without fail.
- Post graduate students may be involved to work on basic research of theme area, wherever possible.
- All the plant protection scientists are requested to propose projects for external funding

## E. ACTION PLAN (2019-2020)

### Thrust Areas for Research

- ❖ Monitoring of pests and diseases
- ❖ Identification of resistant sources and study of mechanism of resistance
- ❖ Management of pests and diseases (Bio intensive / Use of newer molecules / IPM)

**Theme Area 1: Action Plan 1. Monitoring pest and diseases of groundnut, sesame, castor and sunflower**

| **Theme leaders** | **Dr. K. Karunanithi, Professor (Plant Pathology) and Dr. P. Indiragandhi, Asst. Professor (Agrl. Entomology), RRS, Vridhachalam** | | |
|---|---|---|---|
| **Activity** | **Name of the Scientist** | **2019-2020** | **Deliverables** |
| Monitoring the incidence of important pest and diseases | RRS, Vriddhachalam<br>Dr.P. Indiragandhi (Groundnut)<br>Dr.R.Sheeba Jasmine (Sesame)<br>Dr.B.Meena (Sesame)<br>Dr.G.Senthilraja (Groundnut)<br>& Dr. S. Kokilavani, ACRC, Coimbatore | Incidence of pest and diseases will be monitored throughout the crop period during *kharif*, *rabi* and summer both in fixed and roving survey<br>Pest and disease incidence will be correlated with weather parameters. | Forecasting seasonal occurrence of major insect pests.<br>Monitoring of invasive pests, if any? |
| | CRS, Aliyarnagar<br>Dr. C. Ushamalini (Groundnut)<br>Dr.M.Alagar (Groundnut)<br>ORS, Tindivanam<br>Dr.M.Rajakumar (Groundnut) &<br>Dr. S. Kokilavani, ACRC, Coimbatore | | |
| | TCRS, Yethapur<br>Dr.B.Geetha (Castor)<br>Dr. M.Deivamani (Castor) &<br>Dr. S. Kokilavani, ACRC, Coimbatore<br>TNAU, Coimbatore<br>Dr. L.Rajendran (Sunflower)<br>Dr. K.Senguttuvan (Sunflower) &<br>Dr. S. Kokilavani, ACRC, Coimbatore | | |

**Theme Area 2: Action Plan 2. Identification of resistant sources and mechanisms of resistance for insect pest and diseases**

| **Theme leader** | **Dr. B. Meena, Associate Professor (Plant Pathology), RRS, Vriddhachalam**<br>**Dr. P. Indiragandhi, Asst Professor (Agrl Entomology)** | | | |
|---|---|---|---|---|
| **Activity** | **Name of the scientist** | | **2019-2020** | **Deliverables** |
| | Insect pests | Diseases | | |
| Identification of resistant entries for defoliators, sucking pests and diseases for the cultures available in the station collection/breeding derivatives | RRS, Vridhachalam<br>Dr.P. Indiragandhi (Groundnut)<br>Assistant Professor (Agrl. Ento)<br>Dr.R.Sheeba Jasmine (Sesame)<br>Assistant Professor (Agrl. Ento)<br><br>CRS, Aliyarnagar<br>Dr.M.Alagar (Groundnut)<br>Assistant Professor (Agrl. Ento)<br><br>TCRS, Yethapur<br>Dr.B.Geetha (Castor)<br>TNAU, Coimbatore<br>Dr. K. Senguttuvan (Sunflower)<br>Assistant Professor (Agrl. Ento) | RRS, Vriddhachalam<br>Dr. G. Senthilraja (Groundnut)<br>Dr. B. Meena (Sesame)<br><br>CRS, Aliyarnagar<br>Dr. C.Ushamalini (Groundnut)<br><br>ORS, Tindivanam<br>Dr. M.Rajakumar (Groundnut)<br><br>TCRS, Yethapur<br>Dr. M. Deivamani (Castor)<br><br>Dept. of Oilseeds, Coimbatore<br>Dr. L.Rajendran (Sunflower) | • Cultures in pipeline at research stations will be screened.<br>• Mechanism of resistance will be studied<br>• Observations Physical : Trichome length & density, leaf size & thickness, leaf color Biochemical : phenols, protein, tannin, carbohydrate and reducing sugars,<br>• Confirmation of resistance in the most promising entries through artificial screening | Mechanism of resistance explored in the pre release culture and anchoring the release of new variety |

**Theme area 3: Action Plan 3. IPM module for Management of defoliators in groundnut**

| **Theme leader** | **Dr. P.Indiragandhi, Asst. Professor (Agrl Entomology), RRS, Vriddhachalam** | | |
|---|---|---|---|
| **Activity** | **Name of the scientist** | **2019-2020** | **Deliverables** |
| IPM capsule for leafminer management in *kharif* groundnut | RRS, Vriddhachalam<br>Dr. P. Indiragandhi (Groundnut)<br>Assistant Professor (Agrl. Ento)<br><br>CRS, Aliyarnagar<br>Dr.M.Alagar (Groundnut)<br>Assistant Professor (Agrl. Ento)<br><br>ARS, Bhavanisagar<br>Dr.M.Senthilkumar (Groundnut)<br>Assistant Professor (Agrl. Ento)<br><br>Trial: 2 nos/centre (one in station and one in farmer's field) | T1-IPM module<br>• Application of neem cake @ 250 kg/ha<br>• Installation of light trap @1/ha<br>• Trap crop – castor or cowpea<br>• Mass trapping with pheromone trap @12/ha<br>• *Metarhizium rileyi* @ 4g/lit (CFU $10^8$ / ml)<br>• *Beauveria bassiana* @ 4g/lit<br>• Cumbu as intercrop (6:1) and cow pea as border crop<br>• Azadirachtin 1% @ 1.5 ml/lit<br>• Need based application of insecticide - novaluron 10EC @ 2/ml<br>T2 – Farmers" Practice<br>T3 - Control<br>**Observations to be recorded**<br>• Pest and natural enemies population<br>• Pest defender ratio, preference ratio<br>• Yield, B:C ratio<br>• Pheromone trap catches and weather parameters | IPM capsule for the management of defoliators of groundnut |

**Theme area 4: Action plan 4. Pongamia oil derived formulation for major pests of groundnut, sesame and castor**

| **Theme leader** | **Dr.P.Indiragandhi, Asst. Professor (Agrl. Entomology), RRS, Vriddhachalam** | | |
|---|---|---|---|
| **Activity** | **Name of the scientist** | **2019-2020** | **Deliverables** |
| Pongamia oil derived formulation for major pests of groundnut, sesame and castor | RRS, Vriddhachalam<br>Dr. P. Indiragandhi (Groundnut)<br>CRS, Aliyarnagar<br>Dr.M.Alagar (Groundnut)<br>RRS, Vriddhachalam<br>Dr.R.Sheeba Jasmine (Sesame)<br>TCRS, Yethapur<br>Dr.B.Geetha (Castor)<br>Trial: 2/ centre (one in station and one in farmer's field) | **Treatment details**<br>T1-Azadirachtin 10000 ppm @ 1.5 ml/lit<br>T2- Pongamia oil derived formulation @ 1 ml/lit<br>T3-Pongamia oil derived formulation @ 2 ml/lit<br>T4-Pongamia oil derived formulation @ 3 ml/lit<br>T5-Insecticide check (crop based)<br>T6 - Untreated check<br>Observations to be recorded<br>• Bio efficacy of pongamia oil derived formulation<br>• Natural enemies<br>• Phytotoxicity studies (x, 2x & 4x)<br>• Yield, B:C ratio | Use of pongamia oil derived formulation in the management of major insect pests of groundnut, sesame and castor. |

**Theme area 5: Action plan 6. Management of red spider mite in groundnut**

| **Theme leader** | **Dr.P.Indiragandhi, Asst. Professor (Agrl. Entomology), RRS, Vriddhachalam** | | |
|---|---|---|---|
| **Activity** | **Name of the scientist** | **2019-2020** | **Deliverables** |
| Management of red spider mite in groundnut during *rabi* season | RRS, Vridhachalam<br>Dr. P. Indiragandhi (Groundnut)<br>Trial: 2/ centre | **Treatment details**<br>(2 sprays at 60 & 75 DAS)<br>Water extract of<br>T1 - Basil leaf extract 5%<br>T2 -NSKE 5%<br>T3- Bael leaf extract 5%<br>T4- Notchi leaf extract 5%<br>T5- Propargite 25EC @ 2.5ml /lit<br>T6- Control<br>Observations to be recorded<br>• Mite population / $cm^2$ leaf area<br>• Yield, B:C ratio | Management strategy for red spider mite |

**Theme area: 6 Action plan 7. Assessment of yield loss in sesame due to pod bug**

| **Theme leader** | **Dr.R.Sheeba Jasmine , Asst. Professor (Agrl. Entomology), RRS, Vriddhachalam** | | |
|---|---|---|---|
| **Activity** | **Name of the scientist** | **2019-2020** | **Deliverables** |
| ssessment of yield loss in sesame due to pod bug | Dr.R.Sheeba Jasmine (Sesame)<br>RRS, Vriddhachalam | Varieties<br>VRI 2, VRI 3 & TMV 4<br>Season: *kharif* and *rabi*/summer<br>Design: RBD<br>Treatments: 5 levels of damage (0, 5, 10, 20 & 30%)<br>Replication : 3<br>Plot size : 4 x 5 m<br>Spacing : 30 x 30 cm<br>Observations to be recorded<br>• Seed yield (kg/ha) | Yield loss due to sesame pod bug will be assessed |

**Theme area 3: Action Plan 8. IDM for major diseases of sesame**

| **Theme leader** | | **Dr. B. Meena, Assoc. Professor (Pl.Path), RRS, Vriddhachalam** | | |
|---|---|---|---|---|
| **S.No** | **Activity** | **Name of the scientist and centre** | **Observations to be recorded** | **Deliverables/ expected outcome** |
| 1. | Integrated management of stem and root rot of sesame | RRS, Vriddhachalam<br>Dr.B.Meena<br>Assoc. Prof.<br>(Pl. Path.) | Record the disease incidence of stem and root rot, foliar diseases and yield parameters | • Effective management strategy will be evolved for major diseases of sesame |

T1-ST with *T. asperellum* @ 10g/kg of seed + Soil application of *T. asperellum* @ 2.5 kg/ha

T2- ST with *Bacillus subtilis @* 10g/kg of seed + Soil application of *Bacillus subtilis* @ 2.5 kg/ha

T3-ST with carbendazim @ 2g/kg + spraying of carbendazim + mancozeb @ 0.1% on 30 DAS

T4- ST with *T. asperellum* @ 10g/kg of seed + spraying of carbendazim + mancozeb @ 0.1% on 30 DAS

T5- ST with *Bacillus subtilis* @ 10g/kg of seed + spraying of carbendazim + mancozeb @ 0.1% on 30 DAS

T6-Control

**Theme area 3: Action Plan 9. Management of *Botryotinia* grey mold and capsule borer in castor**

| **Theme leader** | | **Dr. M. Deivamani, Asst.Professor (Pl.Path), TCRS, Yethapur** | | |
|---|---|---|---|---|
| **S.No** | **Activity** | **Name of the scientist and centre** | **Observations to be recorded** | **Deliverables/ expected outcome** |
| 1. | Development of suitable management practices for the control of *Botryotinia ricini* and capsule borer in castor | Dr. M. Deivamani, Asst. Professor (Plant Pathology), TCRS, Yethapur Dr.B.Geetha, Assoc. Professor (Agrl. Ento.) | Disease incidence, pest infestation and seed yield | Integrated management practices for grey mold and capsule borer in castor |

T1- Seed treatment with *Bacillus subtilis* @ 10g/kg and foliar spray of *B. subtilis* @ 0.2 percent (45, 60 and 75 DAS)

T2– Foliar spray of *Bacillus subtilis* 0.2 per cent *+ Beauveria bassiana* @ 2kg / ha (45, 60 and 75 DAS)

T3 – Foliar spray of carbendazim @ 0.2 per cent and profenophos 50 EC @ 0.025% (45, 60 and 75 DAS)

T4 – Control

**Theme area 3: Action Plan 10. IDM for major diseases of sunflower**

| **Theme leader** | | **Dr. L. Rajendran, Asst. Professor (Pl.Path), TNAU, Coimbatore** | | |
|---|---|---|---|---|
| **S.No** | **Activity** | **Name of the scientist and centre** | **Observations to be recorded** | **Deliverables/ expected outcome** |
| 1. | Integrated disease management of necrosis, leaf spot and powdery mildew in sunflower | Dr. L. Rajendran, Asst. Professor (Pl.Path), TNAU, Coimbatore | Record the disease incidence of necrosis, leaf spot and powdery mildew and yield parameters | Effective management strategy will be evolved for sunflower diseases |

T1-Seed treatment (ST) with salicylic acid 50 ppm, Neem oil 3 % during 30 DAS, foliar spray with zineb + hexaconazole @ 2.5g/lit during 45 and 60 DAS

T2- Seed treatment (ST) with salicylic acid 100 ppm, Neem oil 3 % during 30 DAS, foliar spray with zineb + hexaconazole @ 2.5g/lit during 45 and 60 DAS

T2- ST with imidacloprid 70WS @ 2g/kg seed + two sprays of mancozeb @1kg/ha during 45 and 60 DAS

T3-Control

## IV CLOSING REMARKS AND WAY FORWARD

### Vice Chancellor

- In groundnut germplasm characterization studies may be completed and the focus may be on the utilization of germplasm for crop improvement
- Standard operative procedures for drought tolerance studies to be followed before declaring a variety/culture as drought tolerant
- Technical Directors may visit the research stations and colleges to have firsthand knowledge about the cultures/varieties/other technologies under testing, so as to have clarity in discussion during the crop meets.

### Director of Research

### Way forward

- Breeding of oilseeds using molecular tools to evolve genotypes resistant to pests and diseases
- Capsule of management strategies to improve oilseeds productivity under various production systems
- Smart delivery of nano-agri inputs to augment oilseeds productivity while ensuring environmental safety
- Technology capsule for managing devastating pests (capsule borers and whitefly) and diseases (Wilt, Root rot)
- Exploiting modern tools and techniques to determine the intensities of infestation

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