

TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

27TH CROP SCIENTISTS MEET ON SUGARCANE

(April 22-23, 2019)

Lead Center

**Sugarcane Research Station
Tamil Nadu Agricultural University
Cuddalore – 607 001**

Directorate of Research

**Tamil Nadu Agricultural University
Coimbatore - 641 003**

2019

PROCEEDINGS

27TH CROP SCIENTISTS MEET ON SUGARCANE

(April 22-23, 2019)

The 27th Sugarcane Scientists Meet was held during April 22-23, 2019 at the Tamil Nadu Agricultural University, Coimbatore. **Dr. N. Kumar**, Vice Chancellor narrated the importance of sugar industries and its current status of concerns. **Dr. K.S. Subramanian**, Director of Research, welcomed the gathering and briefly presented the research highlights of the year 2018-2019 besides flagging off issues relating to the sugarcane yield and sugar recovery in the State of Tamil Nadu. He suggested for a re-introduction of CAE to evolve high yielding sugarcane varieties, popularization of System of Sugarcane Intensification (SSI) to enhance cane production, farm mechanization without associated ill-effects on soil health and development of Technology capsule for managing devastating pests (ESB & IB) and diseases (Redrot, Smut and YLD). **Dr. K.R. Ashok**, Director (CARDS) elucidated the current sugarcane production scenarios in India and Tamil Nadu. The action taken reports on the 27th Sugarcane Scientists Meet were presented by the lead scientists from Sugarcane Research Station, Cuddalore. During the concurrent sessions, the technical directors had reviewed the on-going university research projects (34), action plan projects (2), core projects (3) and AICRP (1). The outcome of the review process was presented by **Dr. S. Geetha**, Director (CPBG), **Dr. V. Geethalakshmi**, Director (Crop Management) and **Dr. K. Prabakar**, Director (CPPS). The Vice Chancellor concluded the meet with a suggestion that the scientists should work together to fulfill the requirements of the State. Dr. V. Ambethgar, Director, TRRI, Aduthurai, proposed a formal vote of thanks.

The proceedings of the meet is furnished as below

I. CROP IMPROVEMENT

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

II. CROP MANAGEMENT

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

IV. CLOSING REMARKS & WAY FORWARD

V PARTICIPANTS

I. CROP IMPROVEMENT

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

A1. Variety Release

- a. Culture indentified for release to East Coast Zone (AICRP): **CoC 13339**
- b. Culture recommended for release (State) during 2019: **C 29442 & G 2005 047**

A2. ART

Category	Clones	Cane Yield (t/ha)	CCS (%)	Red Rot reaction	Proposed centre
Early	C 31 098	139.25	12.95	MR	SRS, Cuddalore
	G 08 028	133.20	13.01	MR	SRS, Melalathur
	Co 13003	128.48	14.39	MR	SBI , Coimbatore
Checks	Co 86032	117.55	12.85	-	
	COG (SC) 6	132.00	13.00	-	
Midlate	C 30 010	140.75	13.05	MR	SRS, Cuddalore
	G 08 019	132.00	13.06	MR	SRS, Melalathur
	Co 06 031	139.57	14.65	MR	SBI , Coimbatore
	Co 14 016	140.71	13.58	MR	SBI , Coimbatore
	Co 15 007	106.28	15.05	MR	SBI , Coimbatore
Checks	Co 86032	117.55	12.85	-	
	TNAU Si 8	124.65	12.70	-	

Traits to be observed

1. Number of tillers ('000/ha)
2. Number of Millable Cane ('000/ha)
3. Stalk length (cm)
4. Cane diameter (cm)
5. CCS (%)
6. CCS yield (t/ha) and
7. Cane yield (t/ ha)

Allotment of centres for distribution of seed/planting materials for ART

1. SRS, Cuddalore - No. of locations / Sugar Mills – 4
 - i. M/s E.I.D. Parry India Pvt. Ltd., Sugar Mill, Nellikuppam,
 - ii. M/s Rajshree Sugar mill Unit- I, Mundiampakkam,
 - iii. M/s Pondicherry Co-operative sugar mill, L. Palayam &
 - iv. M/s Cheyyar Co-operative Sugar mill, Cheyyar

2. SRS, Sirugamani - No. of locations / Sugar Mills – 5
 - i. M/s E.I.D. Parry India Pvt. Ltd., Sugar mill, Pettavathalai
 - ii. M/s E.I.D. Parry India Pvt. Ltd., Sugar mill, Pugalur
 - iii. M/s The Salem Co-operative Sugar Mill, Mohanur
 - iv. M/s Kothari Sugars, Kattur
 - v. M/s V. V. Sugars, Perambalur

3. SRS, Melalathur - No. of locations / Sugar mills – 5
 - i. M/s Ambur Co-operative mill, Vadapudupattu
 - ii. M/s Vellore Co-operative mill, Ammundi
 - iii. M/s Thirupathur Co-operative Sugar mills, Kethandapatti
 - iv. M/s Subramaniya Siva Co-operative Sugar mills, Harur
 - v. M/s Dharmapuri District Co-operative Sugar mills, Palacode

4. Sugarcane Breeding Institute, Coimbatore - No. of locations/ Sugar Mills—4
 - i. M/s Bannari Amman sugars, Aluthukombai, Sathayamangalam
 - ii. M/s Sakthi sugars, Appakoodal, Erode
 - iii. M/s Ponni Sugars, Pallipalayam, Erode
 - iv. M/s Amaravathi Co-operative Sugar Mill, Udumalaipettai

Scientists in-charge

Dr. R. Sudhagar, Associate Professor (PBG), SRS, Melalathur

Dr. M. Shanmuganathan, Asst. Professor (PBG), SRS, Cuddalore

Scientist designated by the Director, SBI, Coimbatore

A3. MLT

Category	Clones	Cane Yield (t/ha)	CCS (%)	Reaction to red rot
Early clones	G 10 045	135.00	13.04	MR
	G 09 045	120.5	13.24	MR
	C 2014-192	134.4	13.0	MR
	C 2014-516	135.4	13.1	R
Midlate clones	G 11 035	133.55	13.10	MR
	G 12 042	127.06	13.00	MR
	C 2014-413	135.2	12.9	MR
	C 2014-436	136.5	13.0	MR

Traits to be observed

1. Number of tillers ('000/ha)
2. Number of Millable Cane ('000/ha)
3. Stalk length (cm)
4. Cane diameter (cm)
5. CCS (%)
6. CCS yield (t/ha)
7. Cane yield (t/ ha)

Locations

1. SRS, Cuddalore
2. SRS, Sirugamani
3. SRS, Melalathur
4. SBI, Coimbatore

Scientists in-charge

1. Dr. R. Sudhagar, Associate Professor (PBG), SRS, Melalathur
2. Dr. M. Shanmuganathan, Asst. Professor (Plant Breeding), SRS, Cuddalore
3. Designated Scientist/Scientist identified or deputed to, SRS, Sirugamani
4. Scientist designated by the Director, SBI, Coimbatore

B. Research Projects on Sugarcane

S.No	Discipline/Station	University Research Projects	AICRP project	Externally Funded Project	Total	No. of Scientists
1.	SRS, Cuddalore	1	1	-	2	1
2.	SRS, Sirugamani	3	-	-	3	-
3.	SRS, Melalathur	2	-	-	2	1
	Total	6	1	-	7	2

C. Ongoing URPs / AICRPs in Crop Improvement

No.	Project No. and Title	Project leaders	Duration	Remarks
C1. University Research Projects (URPs)				
1.	CPBG/ CDL/ PBG/ SUG/ 2017/ 001 Evaluation and identification of high sugar varieties with red rot resistance for Tamil Nadu.	Dr.M.Shanmuaganthan Asst. Professor (PB&G), SRS, Cuddalore	April 2017 – March 2020	The project shall be continued.
2.	CPBG/SGM/PBG/SUG/2014/001 Evolving mid-late maturing sugarcane varieties with high yield, quality and in-built resistance for red rot disease to cater the needs of Cauvery delta zone.	Dr.M.Shanmuganathan Asst. Professor (PB&G)	Oct.2014 –Sept. 2019	The project shall be continued.
3.	CPBG/SGM/PBG/SUG/2014/002 Evolving sugarcane varieties suitable for early season	Dr.M.Shanmuganathan Asst. Professor (PB&G)	Oct 2014 to Sept. 2019	The project shall be continued

	with high yield, quality coupled with resistance for red rot disease.			
4.	CPBG/SGM/PBG/SUG/2014/003 Hybridization, fluff study, individual seedling selection and early stage selection in sugarcane (Saccharum spp. Hybrid)	Dr.M.Shanmuganathan Asst. Professor (PB&G)	Dec 2014 – Nov 2019	The project shall be continued.
5.	CPBG/MLT/PBG/SUG/2014/ 002* Evolving high yielding and high quality sugarcane clones with red rot resistance for early season.	Dr. N. A. Saravanan, Asst. Professor (PB&G)	March 2014 to Feb 2018	The project may be closed and a new project shall be proposed.
6.	CPBG/MLT/PBG/SUG/2014/ 003* Evolving high yielding and high quality sugarcane clones with red rot resistance for mid late season.	Dr. N.A. Saravanan, Asst. Professor (PB&G)	March 2014 – Feb 2018	The project may be closed and a new project shall be proposed.
C2. AICRPs				
7.	AICRP/PBG /CUD/SUG /025 AICRP on Sugarcane	Dr.M.Shanmuganthan Asst. Professor (PB&G) SRS, Cuddalore	Continuous	The project shall be continued.

D. General remarks:

1. Research findings and outcome of the projects and trials shall be published in peer reviewed journals (Action: Plant Breeders of SRS, Cuddalore, Melalathur and Sirugamani).
2. The sugarcane clones with special traits may be registered as genetic stocks (Action: Plant Breeders of SRS, Cuddalore, Melalathur and Sirugamani).
3. Plant Breeders from all the three sugarcane research stations have to attend the crossing program at NHG facility, Sugarcane Breeding Institute, Coimbatore from the ensuing season 2019 onwards. The total crossing duration dates is to be divided into equal three splits and each breeder or designated scientist from all the three Stations have to attend one cycle of crossing program (Action: The Professor and Head, SRS, Cuddalore, Sirugamani and Melalathur).
4. While selecting clones due importance for brix (>22) and millable canes (minimum of 5) shall be given (Action: Plant Breeders of SRS, Cuddalore, Melalathur and Sirugamani).
5. The fluff is to be spared among all the three stations after receipt at SRS, Cuddalore for the crosses effected by the Station concerned without delay so as to avoid the issue of high temperature at fluff nursery (Action: The Professor and Head, Sugarcane Research Station, Cuddalore and the AICRP breeder (Plant Breeding), SRS, Cuddalore).
6. Few slots for AICRP clone nominations shall be allotted for SRS, Sirugamani and SRS, Melalathur till they get appropriate, respective provisions from AICRP (Action: The Professor and Head, Sugarcane Research Station, Cuddalore and the AICRP breeder (Plant Breeding), SRS, Cuddalore).
7. The Director, SBI, Coimbatore shall be requested to nominate clones for MLT instead of ART. The best performing clones from MLT shall be forwarded for further breeding cycles (Action: The Professor and Head, Sugarcane Research Station, Cuddalore).

F. Action Plan (2019 – 2022)

Action Plan 1.	Developing high yielding with high sugar recovery			
	Activity	Responsible centre	Plan of work	Deliverables
	Hybridization, fluff seedling screening for red rot	Hybridization at NHG: SRS, Cuddalore SRS, Sirugamani SRS, Melalathur Fluff screening: SRS, Cuddalore	I. Hybridization at Sugarcane Breeding Institute, Coimbatore between high sugar varieties like CoC 671, Co 86032 and high yielding varieties like CoV 92102, CoV 94101 II. Fluff raising and screening the fluff seedlings for red rot using spore suspension spray technique	Development of high yielding, high sugar clone with in-build red rot resistance
	Induced mutagenesis	SRS, Melalathur	I. Induced mutagenesis in high sugar varieties II. Development of seedling from mutated fluff/buds	
	Raising ground nursery , selection of elite clone and validation by marker technique	SRS, Cuddalore SRS, Melalathur SRS, Sirugamani CPMB&B, Coimbatore	I. Raising ground nursery from red rot screened fluff seedlings and mutated fluff seedlings II. Selection of elite clone with more than 22 HR Brix and more than 4 millable cane III. Validation of selected clones for high sugar content using markers	
	Conducting progeny row trial and Initial yield trial	SRS, Cuddalore SRS, Melalathur SRS, Sirugamani	Performance evaluation of selected clones for cane yield and juice quality parameters	

Action Plan 2.	Breeding for climate resilient clones			
	Hybridization, fluff seedling screening for red rot	Hybridization at NHG: SRS, Cuddalore SRS, Sirugamani SRS, Melalathur Fluff screening: SRS, Cuddalore	I. Hybridization work at Sugarcane Breeding Institute, Coimbatore between high sugar varieties like CoC 671, Co 86032 and high yielding varieties like CoV 92102, CoV 94101 II. Fluff raising and screening the fluff seedlings for red rot using spore suspension spray technique	Development of drought and salt tolerant high yielding, high quality and in-built red rot resistance clone
	Raising ground nursery , selection of elite clone and validation by marker technique	Ground nursery: SRS, Cuddalore SRS, Melalathur Screening for salinity CPBG & Dept of Crop Physiology Marker validation CPMB&B, Coimbatore	I. Raising ground nursery from red rot screened fluff seedlings in drought situation II. Validation of selected clones for high sugar content using markers	
	Screening for sodicity	ADAC&RI, Trichy	The selected clone from drought condition will be screened for sodicity condition Selection of clones with more than 22 HR Brix and more than 4 millable cane	
Confirmation trial	SRS, Cuddalore, Sirugamani & Melalathur	The elite clone with drought and sodicity tolerance and in-built red rot resistance will be confirmed through regular station trials		

Action Plan 3.	Developing jaggery clones			
	Screening for Jaggery qualities of high sugared clones from Cuddalore, Sirugamani and Melalathur with red rot tolerance	SRS, Melalathur	I. Assembling of high sugared clones from all three sugarcane research stations II. Screening the assembled clones for high sugar and high jaggery yield	Identification and release of high sugared clone for jaggery
	Conducting Adaptive Research Trials and On Farm Trials	SRS, Cuddalore, Sirugamani & Melalathur	I. Conducting ARTs and OFTs for assessing the sugar content and jaggery yield	
	Release of sugarcane variety with high jaggery yield	SRS, Melalathur	I. Identification of high sugared and jaggery yielding clone for release II. Variety release	
Development of high sugar somaclones of COC 671 with red rot resistance				
Action Plan 4.	Somaclone development & <i>in vitro</i> screening	CPMB&B	I. Developing somclones for the varieties CoC 671, Co 92005 and Co 92061 II. Callus mutation II. Screening the somaclones for red rot using culture filtrate as a selection agent IV. Plantlet development from the selected somaclones	Development and release of red rot resistant Somaclone of CoC 67, Co 92005 and Co 92061 with red rot resistance

	Red rot screening by plug method	SRS, Cuddalore	<ul style="list-style-type: none"> I. Screening the somaclones for red rot screening at field level by plug method II. Multiplication of red rot resistant somaclones for conduction OFTs 	
	Conducting On Farm Trials	SRS, Cuddalore, Sirugamani & Melalathur	<ul style="list-style-type: none"> I. Conducting OFTs II. Variety release 	

II. CROP MANAGEMENT

A. Decisions made on Adoption / OFT

A1. For Adoption

1. Effect of combined inoculation of new formulation of Arbuscular Mycorrhizal fungi and *Gluconacetobacter diazotrophicus* on growth and yield of sugarcane

Sett treatment with water soluble formulation of Arbuscular Mycorrhizal Fungi @ 25gram/ha and *Gluconacetobacter diazotrophicus* @ 25gram/ha (with 75 % N&P)

2. Studies on plant geometry and intercropping under sustainable sugarcane initiative (SSI) in Cauvery delta region

Planting of chip budded seedlings at 150 cm in double rows with sunnhemp as intercrop

A2. For OFT

OFT 1. Nutri - pellet Pack Fertilization in Sugarcane

Centres:

SRS, Cuddalore
SRS, Sirugamani.

Treatments

T₁ : Soil Test Based NPK + FYM (12.5 t ha⁻¹)
T₂ : Nutri -pellet Pack + Sugar Industry Bio - Compost (SIBC)
T₃ : Nutri -pellet Pack enriched with TNAU MN mixture

- Placement of Nutri - pellet Packs (NPP) containing 50% of Soil Test based NPK are done by the side of chip bud seedling at 5 cm depth while transplanting. Remaining NPPs with 50% NPK are placed @ 90 DATP at 5 cm depth while earthing up.
- Sugar Industry Bio - compost (SIBC) is applied at 2 t ha⁻¹.
- TNAU Micronutrient Mixture @ 50 kg ha⁻¹ is combined with NPK in NPP.

Observations to be recorded:

- | | |
|---------------------------------------|--------------------------------|
| 1. Germination % | 6. Individual cane weight (kg) |
| 2. Number of tillers (000/ha) | 7. Number of internodes/cane |
| 3. Number of Millable Canes (^000/ha) | 8. CCS (%) |
| 4. Stalk length (cm) | 9. Sugar yield (t/ha) |
| 5. Cane diameter (cm) | 10. Cane yield (t/ha) |

OFT 2. Integrated best management practices for resource conservation in sugarcane

Centres:

SRS, Cuddalore and SRS, Sirugamani in collaboration with sugar mills and farmers field

Treatments

T₁ - Integration of mechanization in sugarcane cultivation

- ❖ Crop geometry: Adoption of 150 cm inter-row spacing.
- ❖ Sett treatment with bio-inoculants (*G. diazotrophicus* and AM fungi)
- ❖ Irrigation : Sub-surface drip fertigation.
- ❖ *In situ* trash decomposition after cane harvest with TNAU Bio-mineralizer @ 2 kg/t

• Mechanization

- Power weeder (30 & 60 DAP), Earthing up (90 DAP), Detrashing at 150 and 210 DAP
- Harvesting by Combined harvester, Trash shredder

T₂ - Control (Spacing 90 cm, manual cutting and planting, sett treatment with fungicides, surface flood irrigation, manual weeding, trash burning, no detrashing & Earthing up, manual harvesting).

Observations to be recorded

- | | |
|---------------------------------------|--------------------------------|
| 1. Germination % | 6. Individual cane weight (kg) |
| 2. Number of tillers (000/ha) | 7. Number of internodes/cane |
| 3. Number of Millable Canes (^000/ha) | 8. CCS (%) |
| 4. Stalk length (cm) | 9. Sugar yield (t/ha) |
| 5. Cane diameter (cm) | 10. Cane yield (t/ha) |

OFT 3. Impact of silicon nutrition on physiology, yield and quality of sugarcane under drought condition

Centres:

SRS, Cuddalore and Agricultural College and Research Institute,
Eachangkottai, Thanjavur.

Treatments

T₁ - Soil application of silica solublizing bacteria @ 12.5 kg mixed with 50kg FYM/ha along with sett treatment of 0.5%K₂SiO₃ alone followed by 2.5% urea and 2.5% murate of potash spray on 20 days interval from 60 to 150 DAP (Imposing of stress once in 20 days interval from 60 to 150 DAP)

T₂- Control (foliar spray of 2.5% urea and 2.5% murate of potash spray on 20 days interval from 60 to 150 DAP)

Observations to be recorded

- | | |
|---------------------------------------|--------------------------------|
| 1. Germination % | 9.Stalk length (cm) |
| 2. Number of tillers (000/ha) | 10.Cane diameter (cm) |
| 3. Number of Millable Canes (^000/ha) | 11.Individual cane weight (kg) |
| 4. Leaf Area (cm ²) | 12.Number of internodes/cane |
| 5.Total chlorophyll content (mg/g) | 13.CCS (%) |
| 6.Chlorophyll stability index (%) | 14.Sugar yield (t/ha) |
| 7.Relative water content (%) | 15.Cane yield (t/ha) |
| 8.Proline (µg/g of tissue) | |

B. Research Projects on Sugarcane

Name of the Research Station	University Research subprojects	AICRP Projects	Externally Funded Projects / Core projects	Student's Thesis	Total
Agronomy					
SRS, Cuddalore	5	-	-	2	7
SRS, Sirugamani	2	-	-	-	2
AC &RI, Madurai	1	-	-	-	1
SS & AC					
TNAU, Coimbatore	-	-	1	1	2
SRS, Sirugamani	1	-	-	-	1
Crop Physiology					
SRS, Cuddalore	2	-	1	-	3
Agri.Microbiology					
SRS, Cuddalore	1	-	1	-	2
AC & RI, Madurai	1	-	-	-	1
Seed Science and Technology					
SRS, Melalathur	1	-	-	-	1
TOTAL	14	-	3	3	20

C. Ongoing URPs / AICRPs / Externally Funded Projects

Agronomy		
No.	Project No. and Title	Remarks
1	CM/CDR/AGR/SUG/2017/002 Integrated best management practices for resource conservation in sugarcane (November 2016 to November 2019)	<ul style="list-style-type: none"> • This project shall be closed • The project may be taken for OFT in collaboration with sugarmills in an area not less than one hectare and the same may be

	<p>Scientists incharge Dr.G.Manickam Professor (Agronomy), SRS, Cuddalore Dr.G.Gayathry, Assistant Professor (Agrl.Microbiology), SRS, Cuddalore Dr. R. Nageswari, Assistant Professor (Agronomy), SRS, Sirugamani</p>	<p>popularized among the farming community.</p>
2.	<p>DCM/CDR/AGR/SUG/2018/CP173 Effect of new generation herbicide molecules and its combination on management of creeper weeds in sugarcane (2018-2019) Dr.G.Manickam, Professor (Agronomy), SRS, Cuddalore</p>	<ul style="list-style-type: none"> • The project shall be continued
3.	<p>DCM/CDR/AGR/SUG/2017/001 Studies on the effect of herbicidal combinations on nut sedge management in sugarcane (January 2017 to June 2019) Dr.G.Manickam, Professor (Agronomy), SRS, Cuddalore</p>	<ul style="list-style-type: none"> • Project may be closed • Completion report to be submitted
4.	<p>NRM/CDR/SAC/SUG/2016/001 Assessing the effect of mechanization on soil compaction in sugarcane and developing suitable management strategies (Nov 2016 to Dec 2019) Dr.M.Jayachandran, Professor and Head, SRS, Cuddalore</p>	<ul style="list-style-type: none"> • The project shall be continued
5.	<p>Effect of sugarcane trash bio-char for carbon sequestration on yield and quality of sugarcane seed crop (M.Sc., Student's thesis 2017-2018) Dr.M.Jayachandran, Professor and Head, SRS, Cuddalore</p>	<ul style="list-style-type: none"> • Thesis submitted • The results are published

6.	<p>Effect of planting materials and integrated nutrient management on yield of sugarcane seed crop. (M.Sc., Student's thesis 2017-2018) Dr.M.Jayachandran, Professor and Head, SRS, Cuddalore</p>	<ul style="list-style-type: none"> • Thesis submitted • The results are published
7.	<p>DCM/CDR/AGR/SUG/2016/001 Studies on identification of promising chewing cane and optimising the doses of N,P and K for sustainable cane yield and quality (March 16 to January 2019) Dr. S. Thiruvarassan, Assistant Professor (Agronomy), Dept.of Cotton, TNAU, Coimbatore</p>	<ul style="list-style-type: none"> • The project shall be continued • The project needs mid- term correction with change of fertilizer doses. • Proposal for change of project leader has to be submitted.
8.	<p>DCM/SGM/AGR/SUG/2016/002 To evolve technology for controlling binding weeds in grown up Sugarcane crop (November 2016 to November 2019) Dr. S. Thiruvarassan, Assistant Professor (Agronomy), Dept.of Cotton, TNAU, Coimbatore</p>	<ul style="list-style-type: none"> • The project may be closed. • The completion report may be submitted.
9.	<p>DCM/SGM/SUG/AGR/2016/001 Studies on plant geometry and intercropping under sustainable sugarcane initiative (SSI) in Cauvery delta region (November 2016 to November 2019) Dr. R.Nageswari, Assistant Professor (Agronomy), SRS, Sirugamani</p>	<ul style="list-style-type: none"> • The project may be closed. • The completion report has to be submitted.
10.	<p>DCM/SGM/AGR/SUG/2016/002 To evolve technology for controlling binding weeds in grown up Sugarcane crop (November 2016 to November 2019) Dr. R.Nageswari, Assistant Professor (Agronomy), SRS, Sirugamani</p>	<ul style="list-style-type: none"> • The project may be closed. • The completion report has to be sent for approval.

11.	DCM/CDR/AGR/SUG/2016/001 Integrated best management practices for resource conservation in sugarcane (November 2016 to November 2019) Dr. L.Chithra Professor and Head, SRS, Sirugamani Dr.J.Kannan, Professor (ENS), Dr.K.Kathirvel, Professor (BioEnergy)	<ul style="list-style-type: none"> •The project is recommended for OFT. •The project may be closed. •Completion report has to be submitted for approval.
12.	DCM /MDU /AGR/SUG/2016/001 Agronomic evaluation of brown manuring and herbicides on management of weeds in sugarcane (Nov' 2016 to March 2019) Dr. S. AnittaFanish, Assistant Professor (Agronomy), TNAU, Coimbatore	<ul style="list-style-type: none"> •The project may be closed. •Completion report has to be submitted for approval.

No.	Project No. and Title	Remarks
Crop Physiology		
1.	DCM/CDR/CRP/SUG/2016/003 Impact of silicon nutrition on physiology, yield and quality of sugarcane under drought condition (March 2016 - July 2019) Tmt. R. Anitha Assistant Professor, (Crop Physiology), SRS, Cuddalore	<ul style="list-style-type: none"> • The project is recommended for OFT • Completion report has to be submitted.
2.	DCM/CDR/CRP/SUG/2018/CP174 Studies on the effect of organic and inorganic inoculants on post-harvest deterioration under manual and mechanical harvest in sugarcane (Dec 2018 to Jan 2020) Tmt. R. Anitha Assistant Professor (Crop Physiology), SRS, Cuddalore	<ul style="list-style-type: none"> • The project shall be continued

No.	Project No. and Title	Remarks
Soil Science & Agricultural Chemistry		
1.	Nutri-pellet Pack Fertilization in Sugarcane (Ph.D Student's thesis) Dr. K. Arulmozhiselvan, Professor (SS&AC) and Project Director, ADAC&RI, Trichy	<ul style="list-style-type: none"> The project is recommended for OFT
2.	NRM/CBE/SAC/SUG/2018/CPO14 Developing multi micronutrient foliar formulation for alleviating the micronutrient deficiencies in sugarcane and groundnut (2018 – 2019) Dr. D. Jegadeeswari, Assoc. Prof. (SS&AC) TNAU, Coimbatore	<ul style="list-style-type: none"> The project shall be continued

No.	Project No. and Title	Remarks
Agricultural Microbiology		
1.	NRM/CDR/AGM/SUG/2018/001 Studies on the standardization and storage stability of fortified sugarcane juice using bio-preservatives.(Jan 2018 – June 2020) Dr. G. Gayathry Assistant Professor, (Ag.Micro), SRS, Cuddalore	<ul style="list-style-type: none"> The project may be closed and the results may be used for publication purpose. A new proposal may be submitted with the preservation of sugarcane juice using latest technologies.
EXTERNALLY FUNDED PROJECTS		
2.	GoI/NRM/CDL/AGM/2017/R0001 Fermentative Production of GABA enriched Kombucha: a value added functional plant beverage (FPB) from underutilized fruits. (March'2017 to March'2020) Dr. G. Gayathry Assistant Professor, (Ag.Micro), SRS, Cuddalore	<ul style="list-style-type: none"> The project shall be continued Salient findings may be given for information

No.	Project No. and Title	Remarks
SEED SCIENCE AND TECHNOLOGY		
1	SEED/MEL/SST/SUG/2016/001 Studies on the effect of Arbuscular mycorrhizal fungi and bioinoculants on Chip bud seedling vigor and resultant seed cane yield and Quality (February 2016 to February 2019) Dr.K.Indira, Professor, (Seed Science &Tech)	<ul style="list-style-type: none"> • The project may be closed. • Completion report has to be submitted for approval.

D. General Remarks:

- While selecting the promising sugarcane clones for varietal release, adequate emphasis have to be accorded such that the selected promising clones besides registering consistent cane yield and sugar recovery it should exhibit least fluctuations to the diversified agro-climatic situations and this could only be achieved through evaluation of those entries altogether with the existing promising standard varieties in varied agro-climatic situations. Under this juncture, reconstitution of Coordinated Agronomic Experiments on sugarcane scheme in Tamil Nadu might be of viable and suggestive option.

E. ACTION PLAN FOR IDENTIFIED THEMES (2019-2022)

CROP MANAGEMENT				
Theme No. 5		Optimization of fertigation schedule for sugarcane through micro-irrigation techniques under SSI		
Theme Leader		Dr. S. Panneerselvam, Director, Water Technology Centre, TNAU, Coimbatore		
S.No.	Activity	Name of the scientist(s) and centre	Details of the experiment	Deliverables
1.	To optimize the irrigation requirement To improve the fertilizer use efficiency To reduce the cost of cultivation	<p>Coordinating Centre: WTC</p> <p>Dr. S. Panneerselvam, Director, Water Technology Centre, TNAU, Coimbatore</p> <p>Lead Centre SRS, Cuddalore</p> <p>1. Dr.M.Jayachandran, P&H, SRS, Cuddalore</p> <p>2. Dr.G.Manickam, Prof.(AGR), SRS, Cuddalore</p> <p>Implementing Centres SRS, Sirugamani</p> <p>Dr. L. Chithra, P&H, SRS, Sirugamani</p> <p>Dr. R. Nageswari, AP (AGR), SRS, Sirugamani</p> <p>SRS, Melalathur</p> <p>Dr. R. Sudhakar, P&H, SRS, Melalathur</p>	<p>Experiment details:</p> <ul style="list-style-type: none"> • Design: Strip Plot • Replications: Three • Spacing 150 x 60 cm <p>Treatments</p> <p>A. Drip Irrigation with SSI</p> <p>I₁ – Subsurface drip irrigation at 75 % PE - Irrigation once in two days</p> <p>I₂ – Subsurface drip irrigation at 100 % PE - Irrigation once in two days</p> <p>I₃ – Farmers Practice – Surface irrigation</p> <p>B. Nutrient levels (300:100:200 kg N:P:K /ha)</p> <p>N₁ – 100 % of the recommended dose of N:P:K /ha through water soluble</p> <p>N₂ – 125 % of the recommended dose of N:P:K /ha through water soluble</p> <p>N₃ – 100 % of the recommended dose of N:P:K /ha through Urea, Super & MOP</p> <p>N₄ – 125 % of the recommended dose of N:P:K /ha through Urea, Super & MOP</p>	The optimized fertilizer schedule for SSI technology will be evolved

III. CROP PROTECTION

A. Decisions Made on OFT

A1. For Adoption

Management of white grub in sugarcane

Soil drenching of imidacloprid 17.8 SL@ 250 ml/ha in 1000 lit. of water in root zone of affected cane effectively reduced white grub population to a tune of 94.59 % over control with higher cane yield (93.72 t ha⁻¹) and BC ratio (2.50)

A2. For OFT

Evaluation of bio inoculants against white grub of sugarcane

Duration : 2019-2020

T. No.	Treatments	Dose ha ⁻¹
T ₁	<i>Metarhizium anisopliae</i> (4x10 ⁹ cfu/g)	5 kg
T ₂	<i>Beauveria brongniarti</i> (4 x 10 ⁹ cfu/g)	5 kg
T ₃	<i>Beauveria bassiana</i> –TNAU isolate (4 x 10 ⁹ cfu/g)	5 kg
T ₄	Untreated Control	

Replication : 6

Observations to be recorded

1. White grub population / m²
2. Yield
3. CB ratio

Centres:

SRS, Cuddalore

HC & RI (W), Trichy

SRS, Melalathur

Scientists Incharge

Dr. S. Pasupathy, Professor (Agrl. Entomology), SRS, Cuddalore

Dr. V. R. Saminathan, Associate Professor (Agrl.Entomology), HC & RI (W), Trichy

Dr.S. Douressamy, Prof. (Agrl.Entomology), AC&RI, Vazhavachanur will conduct the trial at SRS, Melalalthur

B. Research Projects

Centre	URP	AICRP	EFP	Total
Agricultural Entomology				
SRS, Cuddalore	2	-	-	2
SRS, Melalathur	1	-	-	1
Plant Pathology				
SRS, Cuddalore	1	1	-	2
Nematology				
SRS, Cuddalore	1	-	-	1
Total	5	1	-	6

C. On-going URP / AICRP / Externally funded projects

Agricultural Entomology

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
1	CPPS/CDR/ENT/SUG/2016/001 Screening for assessment of field resistance in sugarcane clones against endemic pests of Cuddalore region.	Dr.S.Douressamy, Professor (Agrl. Entomology)	Feb. 2016 to Jan. 2019	The results are to be consolidated and completion report should be submitted on or before 31.07.2019
2	CPPS/CDR/ENT/SUG/2016/ 002 Ecofriendly management of borer pests and white grub in sugarcane.	Dr.S.Douressamy, Professor (Agrl. Entomology)	Feb. 2016 to Jan. 2019	The results are to be consolidated and completion report should be submitted on or before 31.07.2019

3	CPPS/MEL/ENT/SUG/2018/CP053 Development of IPM packages for management of white grub in sugarcane	Dr. A. Thirumurugan Professor (Agrl. Entomology)	2018-2019	The results are to be consolidated and completion report should be submitted. on or before 31.07.2019
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Plant Pathology

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
1.	CPPS/CDR/PAT /SUG/2017/001 Biosuppression of sugarcane sett rot disease and understanding the mechanism of suppression against <i>Certocystis paradoxa</i>	Dr. V. Ravichandran, Asst. Professor (Plant Pathology)	June, 2017 to March 2020	The project may be continued.
AICRP				
1.	AICRP/PBG/CUD/SUG/025 AICRP on sugarcane	Dr. V. Ravichandran, Asst. Professor (Plant Pathology)	2018-2019	The project may be continued.

Nematology

No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
University Research Project				
1.	CPPS/CDR/NEM/SUG/2015/002 Screening of sugarcane varieties against root knot nematode, <i>Meloidogyne incognita</i> and lesion nematode <i>Pratylenchus zaeae</i> and confirmation on the same.	Dr. J. Jayakumar, Asst.Prof. (Nematology)	Aug. 2015 to July 2019	The results are to be consolidated and completion report should be submitted within two months of completion of the project.

D. GENERAL REMARKS

- All the scientists working in the sugarcane should have minimum of two viable University Research Projects.
- All scientists are requested to publish their findings in reputed peer reviewed journals. Both hard and soft copies of published articles shall be sent to the Director, CPPS, TNAU, Coimbatore for repository purpose.
- The scientists from ACRC, TNAU, Coimbatore may be contacted for analyzing the pest and disease incidence data with weather factors for developing the prediction models.

E. Action Plan for 2019-2022

Theme No. 1	Surveillance of pests and diseases of sugarcane		
Theme Leader	Dr. S. Pasupathy, SRS, Cuddalore, Professor (Agrl. Entomology), SRS, Cuddalore		
Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
<p>Monitoring and surveillance of borers, sucking pests, root feeders and natural enemies in sugarcane in the endemic areas of respective district should be made.</p> <p>Monitoring and surveillance of red rot, smut, wilt and YLD in endemic areas of the respective district.</p> <p>Awareness campaign on the integrated management of pests and diseases should be arranged at appropriate time.</p>	<p>SRS, Cuddalore Dr. S. Pasupathy Professor (Agrl. Entomology) Dr. V. Ravichandran Assistant Professor (Plant Pathology)</p> <p>AC&RI, Vazhavachanur Dr. S. Douressamy Professor (Agrl. Entomology)</p> <p>IOA, Kumulur Dr. V. Bhaskaran Assistant Professor (Agrl. Entomology)</p> <p>ACRC, TNAU, Coimbatore Dr.S. Gokilavani Assistant Professor (Agronomy)</p>	<p>Monitoring and surveillance to be continued.</p> <p>Correlation and regression analysis on pests and diseases damage level with weather factors.</p>	<p>Forecasting the outbreak of pests and diseases and nematodes in sugarcane at appropriate time, for taking up management measures by the farmers.</p> <p>Prediction analysis on the incidence of pests, diseases and nematodes in sugarcane.</p>
Theme No. 2	Identification of resistant sources for pest and diseases		
Theme Leader	Dr. V. Ravichandran, Assistant Professor (Plant Pathology), SRS, Cuddalore		
Action Plan	Name of the scientist(s) and centre	Activity	Deliverables

Screening of AVT clones for field resistance to pest and diseases.	SRS, Cuddalore Dr. S. Pasupathy Professor (Agrl. Entomology) Dr. V. Ravichandran, Assistant Professor (Plant Pathology)	Pests: Early shoot borer, internode borer To be screened under natural field conditions. Diseases: Red rot and smut To be screened by artificial inoculation	Identification of resistant clones for pests and diseases of sugarcane and be utilized for breeding programme.
Theme No. 3	Mechanisms of resistance against pest and diseases		
Theme Leader	Dr. S. Pasupathy, Professor (Agrl. Entomology), SRS, Cuddalore		
Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
The resistance mechanism in the identified less susceptible/ resistant clones against early shoot borer/ red rot will be categorized	SRS, Cuddalore Dr. S. Pasupathy, Professor (Agrl. Entomology) Dr. V. Ravichandran, Assistant Professor (Plant Pathology)	Pests: Early shoot borer, internode borer Antixenosis, Antibiosis & Tolerance Diseases: Red rot and smut Physical, Biochemical and molecular basis	The resistance sources will be utilized for breeding programme.
Theme No. 4	Technology capsule for the management of pests and diseases of sugarcane under wider row planting		
Theme Leader	Dr. S. Pasupathy, Professor (Agrl. Entomology), SRS, Cuddalore		
Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
Technology capsule for the management of pests and diseases of sugarcane	SRS, Cuddalore Dr. S. Pasupathy, Professor (Agrl.	Treatment Details Main Plot M ₁ - Single bud treated with <i>Pseudomonas</i>	IPM package for the management of early shoot borer, smut and

<p>under wider row planting</p>	<p>Entomology) Dr. V. Ravichandran, Assistant Professor (Plant Pathology)</p> <p>AC&RI, Echankottai Dr. A. Thirumurugan Professor (Agrl. Entomology), Dr. A. Yamunarani Assistant Professor (Plant Pathology)</p>	<p><i>fluorescens</i> (Pf1) @ 10 g l⁻¹ + soil application @ 2.5 kg ha⁻¹ at the time of planting & 60 DAP M₂ - Single bud treated with <i>Bacillus subtilis</i> (EPC5) @ 10 g l⁻¹ + soil application @ 2.5 kg ha⁻¹ at the time of planting & 60 DAP M₃ - Single bud treated with <i>Chaetomium globosum</i> (Cg6) @ 10 g l⁻¹ + soil application @ 2.5 kg ha⁻¹ at the time of planting & 60 DAP M₄ - Single bud treated with carbendazim @ 1 g l⁻¹ + soil drenching @ 0.1 % M₅ – Untreated control</p> <p>Sub Plot S₁ - Trash mulching to a thickness of 10 cm along the ridges + installation of sex pheromone traps @ 20 ha⁻¹ (mass trapping) + need based spraying of <i>Btk</i> @ 1kg ha⁻¹ S₂ - Intercropping with sunhemp + installation of sex pheromone traps @ 20 ha⁻¹ (mass trapping) + need based spraying of <i>Btk</i> @ 1kg ha⁻¹ S₃ - Intercropping with blackgram + installation of sex pheromone traps @ 20 ha⁻¹ (mass trapping) + need based spraying of <i>Btk</i> @ 1kg ha⁻¹ S₄ - Intercropping with sunhemp + installation of sex pheromone traps @ 20 ha⁻¹ (mass trapping) + need based spraying of Cartap hydrachloride@ 1kg ha⁻¹ S₅ - Intercropping with blackgram +</p>	<p>red rot incidence in sugarcane</p>
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		<p>installation of sex pheromone traps @ 20 ha⁻¹ (mass trapping) + need based spraying of Cartap hydrachloride @1kg ha⁻¹</p> <p>S₆ - Farmer's practice – Spraying of chlorpyriphos @1250 ml ha⁻¹</p> <p>S₇ - Untreated control</p> <p>Design: FRBD</p> <p>Observations: Early shoot borer, smut and red rot incidence, Yield.</p>	
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IV. Closing Remarks & Way Forward

Vice Chancellor

- Since sugarcane is a nutrient exhaustive crop the status of the nutrient content in soil and physical properties of soil and the build up of nematode population is to be analysed in the soil where sugarcane was grown continuously for long period.
- Before launching new variety in sugarcane the sugar content in cane is to be tested verified by conducting big mill test (BMT) in the sugar factories.
- Mechanization in sugarcane technology may be tested in large scale with collaboration with Sugar mills.
- The viable model for pest and disease forecasting may be developed for timely forewarning the outbreak of pest and diseases.
- Novel method for screening red rot resistance may be developed.
- **Re establishment and strengthening of Co-ordinated Agronomic Experiment on Sugarcane may be initiated.**
- Burning of trashes after harvest may be avoided and insitu decomposition methods may adopted
- Procedure followed for salt tolerance mechanism must be clear and uniform at all centres
- Technology for more number of ratoons from the point of view of population maintenance, protection from pests and diseases and other issues related to productivity may developed.

Director of Research

- Burning of trashes after harvest may be avoided and insitu decomposition methods may adopted
- Procedure followed for salt tolerance mechanism must be clear and uniform at all centres

- Technology for more number of ratoons from the point of view of population maintenance, protection from pests and diseases and other issues related to productivity may developed.
- Sustainable Sugarcane Initiative (SSI) to improve sugarcane productivity may be witnessed
- Complete mechanized sugarcane production technology must be evolved
- Technology capsule for managing devastating pests (early shoot borer) and diseases (red rot and smut) should be developed

Way Forward

- Augment breeding programs and re-introduction of CAE to evolve high yielding sugarcane varieties
- Popularize System of Sugarcane Intensification (SSI) to enhance cane production
- Develop crop management strategies to suit farm mechanization without associated ill-effects on soil health
- Technology capsule for managing devastating pests (ESB & IB) and diseases (Red rot, Smut and YLD)

V. PARTICIPANTS

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