

ICAR - SUGARCANE BREEDING INSTITUTE, COIMBATORE
List of Projects – 2020

DIVISION OF CROP IMPROVEMENT

HEAD (I/C) - Dr. G. HEMAPRABHA

P1-15/1-1 Breeding superior sugarcane varieties of different maturity with improved cane yield, quality and resistance to biotic and abiotic stresses.

PL G. Hemaprabha

(i) Breeding sugarcane varieties for tropical region

(Start : April 1926 End : March 2025)

- a) Hybridisation, seedling and clonal evaluation
G. Hemaprabha, R.M. Shanthi, S. Alarmelu, P. Govindaraj,
A. Anna Durai, K. Mohanraj, C. Appunu,
S. Karthigeyan, R. Karupaiyan, A.J. Prabakaran, C. Mahadevaiah,
S. Sheelamary, T. Lakshmi Pathy, H.K. Mahadevaswamy, V. Vinu,
V. Sreenivasa, K. Elayaraja
- b) Pre Zonal Varietal Trial
 - i) Cane yield and quality – G. Hemaprabha, V. Sreenivasa,
K. Mohanraj and H.K. Mahadevaswamy
 - ii) Screening for diseases
Red rot - P. Malathi
Smut – A. Ramesh Sundar
- c) Botanical characterisation and DNA Finger printing of elite selections and varieties
G. Hemaprabha, H.K. Mahadevaswamy
- d) Identification and testing of short duration sugarcane clones –
R. Karupaiyan, G. Hemaprabha
- e) Evaluation of elite clones for identifying promising location specific sugarcane varieties
 - i. Maharashtra – V. Sreenivasa
 - ii. Andhra Pradesh – K Mohanraj, T. Lakshmi Pathy
 - iii. Karnataka – V. Sreenivasa, H.K. Mahadevaswamy

(ii) Breeding special varieties for high biomass and total sugars for cogeneration, ethanol and forage production

(Start: Nov. 2009 End: Oct. 2022)

- a) Cogeneration and ethanol production
P. Govindaraj, M.R. Meena
- b) Nutritional evaluation, improvement and utilization of newer feed resources for livestock production
ICAR-IGFRI, Jhansi
A.K. Misra, S. B. Maity, K. K. Singh, Sultan Singh, Vijay Kumar
Yadav, P. Koli
ICAR-SBI, Coimbatore
P. Govindaraj, R. Karupaiyan

(iii) Identification of superior sugarcane varieties suitable for different agro-eco climatic regions of Tamil Nadu (ART/MLTs in collaboration with TNAU)

(Start: June 2013 End: Continuous)

A. Anna Durai, K. Mohanraj

(vii) Breeding elite clones suitable for North West Zone

(Start: Feb. 1998 End: Continuous)

(a) Hybridization, progeny evaluation and selection
Ravinder Kumar, M. R. Meena, M.L. Chhabra

(b) Pre-Zonal Varietal Trial
Ravinder Kumar, M. R. Meena, B. Parameswari

(c) Evaluation at sugar factory locations in subtropical India
M.R. Meena, Ravinder Kumar, M.L. Chhabra, S.K. Pandey

(viii) Breeding varieties resistant to waterlogging (Kannur)

(Start: 1984 End: 2025)

M. Nisha, K. Chandran, V. Krishnapriya

(ix) Marker – assisted selection in sugarcane for drought tolerance and red rot resistance

(Start: Jul 2020 End: May 2024)

G. Hemaprabha, H.K. Mahadevaswamy, K. Mohanraj, C. Appunu, R. Viswanathan, R. Manimekalai

(x) Standardization of accelerated flowering in sugarcane for speed breeding (Start: Jul 2020 End: Jul 2021)

K. Mohanraj, R. Arun Kumar

P1-15/1-2 Enhancement of sugarcane germplasm and development of pre-breeding material

PL P. Govindaraj

(iii) Development of Multiparent Advanced Generation Inter-Cross (MAGIC) population for drought tolerance in sugarcane

(Start: Nov. 2014 End: Oct. 2022)

K. Mohanraj, G. Hemaprabha, S. Vasantha

(iv) Collection, Maintenance, Evaluation and Cataloguing of Sugarcane Germplasm at Coimbatore

(Start: April 1980 End: Dec. 2025)

(a) Collection - P. Govindaraj, H.K. Mahadevaswamy

(b) Maintenance at Coimbatore and Wellington -
S. Karthigeyan, S. Sheelamary, M. Sivaswamy (Head, ICAR-IARI Regional Station, Wellington)

(c) Maintenance of commercial hybrids and genetic stocks
H.K. Mahadevaswamy, V. Vinu

(d) National active germplasm maintenance - C. Jayabose,
S. Alarmelu

(e) Characterisation, Evaluation and Cataloguing - C. Jayabose,
S. Karthigeyan

(f) Cytological studies in *Saccharum* and allied genera –
S. spontaneum - V.P. Sobhakumari

(g) Floral biological and cytological characterization of *Erianthus*
- A. Suganya

- (h) Evaluation of sugarcane germplasm for biotic and abiotic stresses at Coimbatore
V. Vinu, T. Lakshmi Pathy, H.K. Mahadevaswamy,
R. Valarmathi, R. Arun Kumar

(vi) Evaluation of sugarcane germplasm, ISH and IGH clones under sub-tropical conditions

(Start: 1998 End: Continuous)

M. R. Meena, Ravinder Kumar, S.K. Pandey, M. L. Chhabra, Pooja,
B. Parameswari

(viii) Utilisation of germplasm resources for developing new genetic stocks (Kannur)

(Start: April 1973 End: 2025)

K. Chandran, M. Nisha, B. Mahendran

(ix) Maintenance of world collection of sugarcane germplasm (Kannur) (Start: 1973 End: 2025)

(a) Maintenance and evaluation of germplasm

K. Chandran, M. Nisha

(b) Monitoring of diseases, pests and quarantine

R. Gopi, B. Mahendran

(c) *In vitro* conservation of germplasm

K. Chandran, M. Nisha

(d) DNA finger printing of *Saccharum officinarum* clones

M. Nisha, K. Chandran

(x) Germplasm maintenance, hybridisation and offseason nursery (Agali) (Start: April 1999 End: Continuous)

(a) Maintenance of core germplasm of sugarcane

V. Sreenivasa

(b) Sugarcane distant hybridization

V. Sreenivasa, A. Anna Durai

(c) Off season nursery

V. Sreenivasa

(xi) Molecular cytogenetic characterization of interspecific and intergeneric hybrids of *Saccharum*

(Start: July 2017 End: July 2021)

V. P. Sobhakumari, K. Mohanraj

(xii) Developing trait specific genetic stocks with biotic and abiotic stress tolerance, quality and yield traits in sugarcane through pre-breeding

(Start: Aug 2018 End: Mar 2024)

(a) Identifying multi trait genetic stocks with improved *Saccharum* genetic base

S. Alarmelu, S. Sheelamary, S. Vasantha

(b) Developing trait specific genetic stocks for biotic and abiotic stress tolerance utilizing novel *Saccharum* germplasm

A. Anna Durai, A.J. Prabakaran, V. Sreenivasa,
H.K. Mahadevaswamy, C. Mahadevaiah, K. Mohanraj,
R. Viswanathan, K. Chandran, R. Arun Kumar

(c) Developing trait specific genetic stocks with *Erianthus* genetic base

K. Mohanraj, H.K. Mahadevaswamy, A. Suganya

(xiii) Improvement of elite interspecific hybrids derived from different cytotypes of *S. spontaneum* through nobilisation with typical clones of *S. officinarum* (2n=80)

(Start: June 2019 End: June 2023)

A. Suganya, A. Selvi, P. Govindaraj, V. Sreenivasa

(xiv) Targeted prebreeding with different cytotypes of *Saccharum spontaneum* L. characterized for abiotic stress tolerance

(Start: Jul 2020 End: Dec 2024)

S. Sheelamary, S. Karthigeyan, V.P. Sobhakumari

(xv) Identification of multiratooning potential of selected interspecific and intergeneric hybrids of *Saccharum* spp.

(Start: Jan 2021 End: Dec 2024)

K. Elayaraja

P1-15/1-3

Sugarcane genomics and molecular markers

PL A. Selvi

(iv) Precise genome editing system in sugarcane CRISPR-Cas: altering the flowering behavior of sugarcane

(Start: May 2016 End: May 2021)

R. Manimekalai, A. Selvi, S. Vasantha, K. Mohanraj, K. Lakshmi

(v) Transcriptome guided mining and validation of genes, miRNAs and their potential targets for water deficit stress

(Start: July 2018 End: June 2021)

A. Selvi, R. Manimekalai, P.T. Prathima, R. Gomathi

(vi) Sucrose regulating genes in sugarcane – analysis of transcript diversity and identification of isoforms / transcript variants

(Start: July 2018 End: June 2021)

P.T. Prathima, T. Lakshmi Pathy,

Avinash Singode (Indian Institute of Millets Research, Hyderabad)

(vii) Isolation and characterization of genes associated with high Water Use Efficiency (WUE) in sugarcane cultivars

(Start: July 2018 End: June 2021)

K. Deva Kumar, P.T. Prathima

P1-15/1-4

Gene discovery and genetic transformation in sugarcane

PL C. Appunu

(iii) Isolation, cloning and characterisation of novel stem specific promoter from *Erianthus arundinaceus*

(Start: June 2016 End: June 2021)

C. Appunu, H.K. Mahadevaswamy

(v) Differential Gene Expression Studies on *Saccharum spontaneum* in Response to Salinity Stress Tolerance

(Start: June 2017 End: March 2021)

K. Lakshmi, S. Vasantha

(vii) CSISPR/Cas9-mediated targeted mutagenesis in sugarcane
(Start: Jul 2020 End: Jun 2023)
C. Appunu, R. Valarmathi

(viii) Deciphering the molecular mechanism regulating tillering in sugarcane through functional genomics approach
(Start: Jul 2020 End: May 2023)
R. Valarmathi, K. Mohanraj, C. Appunu

DIVISION OF CROP PRODUCTION
HEAD: Dr. C. PALANISWAMI

P1-15/2-1

Development of Cropping Systems and Improved Agronomic Practices to Enhance Sugarcane Productivity
PL K. Hari

(vi) Development and promotion of tools and machinery for sugarcane mechanization
(Start: April 2014 End: March 2021)
T. Arumuganathan, C. Palaniswami, V. Venkatasubramanian,
C. Sankaranarayanan, T. Senthil Kumar (ICAR-CIAE RC),
S. Syed Imran (ICAR-CIAE RC)

(vii) Development of improved planting material of sugarcane by priming with plant growth promoting bacteria and other substances (Start: October 2017 End: March 2021)
K. Hari, P. Geetha, P. Malathi, D. Neelamathi, G.S. Suresha,
N. Rajendra Prasad

(viii) Weed management in sugarcane under wide row planting (Start: March 2017 End: March 2021)
S. Anusha, P. Geetha

(ix) Inter institutional collaborative research project on testing and evaluation of IISR sugarcane machineries under tropical condition
(Start: Feb 2019 End: Jan 2022)
A.K. Singh (ICAR-IISR, Lucknow), T. Arumuganathan,
A.S. Tayade, T. Senthil Kumar (ICAR-CIAE RC)

(x) Development of tractor operated whole cane harvester
(Start: Apr 2019 End: Mar 2021)
T. Senthilkumar (ICAR-CIAE RC, CBE),
T. Arumuganathan (ICAR-SBI, CBE),
A.K. Singh and M.K. Singh (ICAR-IISR, Lucknow)

P1-15/2-2

Enhancing physiological efficiency of sugarcane

PL S. Vasantha

(iii) Evaluation of physiological efficiency of commercial hybrids and species clones of *Saccharum* for water use under water limited conditions

(Start: May 2016 End: March 2021)

S. Vasantha, A.S. Tayade, R. Arun Kumar, S. Anusha, G. Hemaprabha

(v) Comparative physiological analysis of tropical and subtropical varieties of sugarcane

(Start: Jan 2018 End: March 2021)

R. Gomathi, R. Arun Kumar, Pooja, K. Elayaraja, V. Krishnapriya

(vi) Radiation use efficiency of sugarcane genotypes as influenced by water levels and crop geometry

(Start: Jun 2017 End: Mar 2021)

R. Arun Kumar, P. Geetha

(vii) Deciphering the physiological basis of nutrient use efficiency in sugarcane

(Start: July 2018 End: June 2022)

V. Krishnapriya, S. Vasantha, R. Arun Kumar, S. Anusha, V. Vinu

(viii) Plant architectural traits for developing ideotype concept in sugarcane for tropical conditions

(Start: Jul 2020 End: Jul 2023)

S. Vasantha, G. Hemaprabha, S. Alarmelu, K. Mohanraj, R. Arun Kumar, V. Sreenivasa, V. Krishnapriya, S. Anusha

(vix) Development of hydroponic screening methodologies for sugarcane varietal evaluation in response to abiotic stress under controlled condition

(Start: Jul 2020 End: Jun 2024)

R. Arun Kumar, V. Krishnapriya, S. Vasantha, K. Hari

P1-15/2-3

Natural Resource Management for Enhancing Productivity and Sustainable Sugarcane Production

PL C. Palaniswami

(iii) Assessment of carbon sequestration in sugarcane growing soils with reference to substrate dynamics

(Start: June 2016 End: May 2021)

C. Palaniswami, A. Vennila

(iv) Development of soil inference system for the management of sugarcane soils using Pedotransfer Function Approach (Start: May 2016 End: March 2021)

A. Vennila, C. Palaniswami, I. Rajendran

(vi) Demonstration of settling transplanting technology for sugarcane

(Start: Nov 2018 End: Continuous)

A. Vennila, S. Anusha, C. Palaniswami, Bakshi Ram

(vii) Development of simulation model for sugarcane production system

(Start: June 2019 End: May 2024)

C. Palaniswami, G. Hemaprabha, A. Vennila, S. Vasantha, K. Hari, R. Gomathi, I. Rajendran, A. Anna Durai, A.S. Tayade, P. Geetha, S. Anusha, G.S. Suresha, R. Arun Kumar, V. Krishnapriya, R. Valarmathi, T. Arumuganathan, R. Karuppaiyan, K. Mohanraj, S. Karthigeyan

(viii) Standardization of nutrient management package for sugarcane under wide-row planting in calcareous soil

(Start: Feb 2020 End: Jan 2023)

A. Vennila, C. Palaniswami, I. Rajendran, G. Hemaprabha

DIVISION OF CROP PROTECTION

HEAD - Dr. R. VISWANATHAN

P1-15/3-1

Host resistance, interactomics, pathogen variability, diagnosis and disease management in sugarcane

PL R. Viswanathan

(i) Screening of sugarcane progenies & germplasm for disease resistance, disease survey & surveillance and impact of climate changes on sugarcane pathogens

(Start : Jan. 1990 End : Continuous)

(a) Screening for red rot resistance

R. Viswanathan, P. Malathi, A. Ramesh Sundar, R. Selvakumar, V. Jayakumar, K. Nithya

(b) Climate changes issues in sugarcane agriculture: assessing potential impact on pathogen virulence and host resistance
R. Viswanathan, R. Selvakumar, P. Malathi and A. Ramesh Sundar

(c) Yellow leaf disease

R. Viswanathan, K. Nithya

(ii) Characterisation of red rot pathotypes

(Start: Dec. 1990 End: Continuous)

R. Viswanathan, R. Selvakumar

(vi) Identification of anti-fungal genes and identifying sugarcane phytoalexins as marker for red rot resistance

(Start: April 2012 End: March 2021)

R. Viswanathan, P. Malathi, A. Ramesh Sundar

(viii) Developing chitosan based nano-delivery systems for disease management and enhancing nutrient use efficiency in sugarcane

(Start: Oct. 2014 End: Dec 2020)

- (a) Inducer nano-particles as smart delivery system for harnessing red rot resistance in sugarcane
V. Jayakumar, A. Ramesh Sundar, R. Viswanathan,
- (b) Nanofertilizers to enhance nutrient use efficiency
C. Palaniswami, V. Jayakumar

(ix) Characterization of rust resistance in sugarcane and dynamics of rust pathogens under changing climate in India (Start: May 2016 End: May 2021)

R. Selvakumar, T. Lakshmi Pathy

(x) Molecular characterization of phytoplasmas associated with sugarcane diseases

(Start: May 2016 End: May 2021)

K. Nithya, R. Viswanathan

(xii) Mechanized means of sett treatment to deliver different agro-inputs for the management of biotic and abiotic stress in sugarcane (Start: May 2016 End: June 2021)

P. Malathi, R. Viswanathan, A. Ramesh Sundar, T. Ramasubramanian, A. Vennila

(xiii) Epidemiology and management of *Fusarium* diseases in sugarcane (Start: May 2017 End: Jun 2021)

R. Viswanathan, R. Selvakumar, P. Malathi, A. Ramesh Sundar, M.L. Chhabra, B. Parameswari, R. Gopi, R. Arun Kumar

(xiv) Harnessing antagonistic microbes for the management of wilt and rot diseases in sugarcane

(Start: July 2017 End: July 2022)

R. Gopi, K. Nithya

P1-15/3-2

Studies on Sugarcane Pests and Their Management

PL K.P. Salin

(xi) Standardization of mass production of scarabaeid specific *Bacillus thuringiensis* using agro-Industrial by products for white grub management (Start: Sep 2017 End: Sep 2021)

P. Mahesh, B. Singaravelu, J. Srikanth, K. Hari

(xii) Temperature driven phenology modelling to assess the impact of climate change on population dynamics of internode borer, *Chilo sacchariphagus indicus* in sugarcane

(Start: July 2018 End: June 2021)

L. Saravanan, T. Ramasubramanian

(xiii) Evaluation of seasonal dynamics and biological control of sugarcane pyrilla, *Pyrilla perpusilla*, in crop island scenario

(Start: July 2018 End: June 2021)

B. Mahendran, R. Gopi, P. Mahesh

(xiv) Isolation of novel Bt isolates from biodiversity hot spots and functional validation of indigenous crystal toxin genes against sugarcane insect pests

(Start: Sep 2019 End: Sep 2024)

B. Singaravelu, C. Appunu, G.S. Suresha, C. Sankaranaryanan, K. Deva Kumar, P. Mahesh

(xv) Screening for novel genes in the transcriptomes of cane crambids for RNAi mediated control

(Start: June 2019 End: June 2022)

T. Ramasubramanian, S. Mohankumar (CPMB & B, TNAU, Coimbatore), P.T. Prathima

(xvi) Prospects for conjunctive use of *Telenomus dignus* and *Cotesia flavipes* against internode borer

(Start: Jul 2020 End: Jun 2023)

J. Srikanth, P. Mahesh, K.P. Salin, L. Saravanan

(xvii) Formulation and field application of *Metarhizium anisopliae* (Metchnikoff) Sorokin (1883) as a mycoinsecticide

(Start: Aug 2020 End: Jul 2021)

N. Geetha, K.P. Salin, T. Ramasubramanian

(xviii) Early detection of mechanism of resistance operating in sugarcane intergeneric hybrids against shoot borer, *Chilo infuscatellus* (Snellen) and internode borer, *Chilo sacchariphagus indicus* (Kapur) (Lepidoptera: Crambidae)

(Start: Jul 2020 End: Jul 2023)

M. Punithavalli, K.P. Salin, K. Mohanraj

P1-15/3-3

Basic and applied studies of sugarcane phytonematodes and entomopathogenic nematodes

PL C. Sankaranarayanan

(ii) Isolation and evaluation of entomopathogenic nematodes (EPN) from white grub endemic areas of subtropical sugarcane ecosystem

(Start: May 2016 End: May 2021)

C. Sankaranarayanan, S.K. Pandey, B. Singaravelu

STATISTICS & ECONOMICS SECTION

P1-15/4-1

Economic and statistical studies in sugarcane and sugar production system

PL P. Murali

(i) An economic analysis on sugar recovery in different states in India (Start: April 2016 End: March 2021)

P. Murali, D. Puthira Prathap

(iv) Economic impact and climate smartness of variety Co 0238 in sub-tropical India

(Start: July 2018 End: June 2022)

P. Murali, D. Puthira Prathap, Ravinder Kumar

- (v) Developing “Sugarcanepedia” – an user friendly knowledge system management for strengthening sugarcane research and development** (Start: Sep 2020 End: Aug 2023)
Bakshi Ram, P. Murali, T. Arumuganathan, D. Puthira Prathap, V. Venkatasubramanian

**EXTENSION SECTION
HEAD – Dr. T. RAJULA SHANTHY**

- P1-15/5-1 Transfer of sugarcane technologies**
PL T. Rajula Shanthy
- (i) Utilisation of extension methods and media for effective transfer of sugarcane technologies**
(Start: Dec. 1986 End: Continuous)
T. Rajula Shanthy, D. Puthira Prathap
- (v) Evaluating the effectiveness of state-level sugarcane R & D workshops – A cross-state assessment**
(Start: Jun 2020 End: Jun 2022)
D. Puthira Prathap, P. Murali

MULTI-DISCIPLINARY PROJECTS

- P1-15/12-1 Standardization of true seed production technique through developing homozygous parental lines and apomixes**
(Start: 2015 End: Continuous)
PL Bakshi Ram, Co-PI G. Hemaprabha
- (a) Inbreeding – G. Hemaprabha, A. Annadurai, K. Chandran, T. Lakshmi Pathy
(b) Anther culture - C. Mahadevaiah, Sanghamitra Samantaray (ICAR-NRRI, Cuttack), H.K. Mahadevaswamy, A. Suganya
(c) Chromosome elimination - V.P. Sobhakumari, K. Lakshmi
(d) Wide hybridization- K. Mohanraj, R. Karupaiyan, A. Suganya
(f) Evaluation of hybrids
i. Tropical (Coimbatore) - R.M. Shanthi, S. Alarmelu, R. Karupaiyan
ii. Subtropical (Karnal) - Ravinder Kumar, M.L. Chhabra
(g) Evaluation for diseases- V. Jayakumar, K. Nithya
(j) Seed processing, packaging and storage – N. Rajendra Prasad
- P2-15/12-2 All India Coordinated Research Project (Sugarcane)**
(Start: 2015 End: Continuous)
PL Bakshi Ram Co-PI P. Govindaraj

**(I) Peninsular Zone
i. Breeding**

- (a) IVT – P. Govindaraj, C. Appunu
Multiplication & Exchange – R.M. Shanthi, C. Mahadevaiah
(b) AVT-I Plant – R. Karupaiyan, V. Sreenivasa
AVT-II Plant - S. Karthigeyan, S. Alarmelu
AVT – Ratoon – A. Anna Durai, H.K. Mahadevaswamy

- (c) Physiological parameters
Salinity – R. Arun Kumar, V. Krishnapriya
Drought – R. Gomathi, R. Arun Kumar, V. Krishnapriya
- (d) Jaggery characters – I. Rajendran
- (e) Nutrient uptake and nutrient use efficiency, fodder value
I. Rajendran, G.S. Suresha
- (f) Ethanol production – I. Rajendran
- (g) Evaluation and identification of climate resilient ISH and IGH genetic stocks
P. Govindaraj, K. Elayaraja

ii. Fluff Supply / National Hybridization Programme

(Start : 1971 End : 2025)

A. Anna Durai, V. Sreenivasa, N. Rajendra Prasad

iii. Agronomy

- (a) Agronomic performance of elite sugarcane genotypes
(Start: March 2001 End: Continuous)
A.S. Tayade, P. Govindaraj, C. Palaniswami, S. Anusha, P. Geetha

iv. Pathology (Continuous)

- (a) Identification of pathotypes / races of red rot pathogen
V. Jayakumar, R. Selvakumar
- (b) Survey of sugarcane diseases naturally occurring in the area on important sugarcane varieties
R. Viswanathan, A. Ramesh Sundar, P. Malathi, R. Selvakumar, V. Jayakumar, K. Nithya
- (c) Evaluation of IET / Zonal varieties for resistance to red rot, smut, YLD, brown rust and pokkah boeng
R. Viswanathan, A. Ramesh Sundar, R. Selvakumar, K. Nithya
- (d) Assessment of elite ISH clones for resistance to red rot
R. Viswanathan
- (e) Efficient delivery of fungicides and other agro inputs to manage major fungal diseases in sugarcane
P. Malathi

v. Entomology (Start: March 2015 End: Continuous)

- (a) Evaluation of zonal varieties/genotypes for their reaction against major insect pests
K.P. Salin, J. Srikanth, P. Mahesh, M. Punithavalli, L. Saravanan, N. Geetha
- (b) Survey and surveillance of sugarcane insect pests
K.P. Salin, J. Srikanth, P. Mahesh, L. Saravanan, N. Geetha, B. Singaravelu, T. Ramasubramanian, M. Punithavalli
- (c) Monitoring of insect pests and bio-agents in sugarcane agro-ecosystem
J. Srikanth, K.P. Salin, P. Mahesh, N. Geetha, B. Singaravelu, M. Punithavalli
- (d) Standardization of simple and cost effective techniques for mass multiplication of sugarcane bio-agents
N. Geetha, J. Srikanth, T. Ramasubramanian, P. Mahesh, L. Saravanan
- (e) Assessment of yield losses caused by borer pests of sugarcane under changing climate scenario
J. Srikanth, N. Geetha, K.P. Salin, P. Mahesh, B. Singaravelu, M. Punithavalli

(II) Subtropical Zone

i. Breeding

- (a) Zonal Varietal Trial (North Western Zone)
Ravinder Kumar, M. R. Meena
- (b) Evaluation and identification of climate resilient ISH and IGH genetic stocks against drought
M.R. Meena, Ravinder Kumar, Pooja

ii. Pathology (Start: Jan. 1998 End: continuous)

- (a) Identification of pathotypes / races of red rot pathogen
B. Parameswari
- (b) Survey of sugarcane diseases naturally occurring in the area on important sugarcane varieties
M. L. Chhabra, B. Parameswari
- (c) Evaluation of IET / Zonal varieties for resistance to red rot
M. L. Chhabra
- (d) Assessment of elite ISH clones for resistance to red rot
M. L. Chhabra
- (e) Yellow leaf disease
B. Parameswari
- (f) Efficient delivery of fungicides and other agro inputs to manage major fungal diseases in sugarcane
M.L. Chhabra, B. Parameswari

iii. Entomology (Start: 2008 End: Continuous)

- (a) Evaluation of zonal varieties/genotypes for their reaction against major insect pests
S.K. Pandey
- (b) Survey and surveillance of sugarcane insect pests
S.K. Pandey
- (c) Monitoring of insect pests and bio agents in sugarcane agro-ecosystem
S.K. Pandey

P2-20/12-3

All India Coordinated Research Project on Biological Control

(Start: Aug 2020 End: Jul 2022)

PL N. Geetha
P. Malathi

EXTERNALLY FUNDED PROJECTS

C1-02/1-1-6

Identification, characterisation and verification of new sugarcane varieties for DUS testing at Coimbatore

(Start: Feb. 2002 End: Continuous)

Nodal officer - R. Karuppaiyan
PL S. Alarmelu
C. Jayabose

- C1-06/1-1-10 ICAR Seed Project: Seed production in agricultural crops**
(Start: April 2007 End: Continuous)
PL A.J. Prabakaran
(i) Breeder seed production – A.J. Prabakaran, N. Rajendra Prasad, S. Karthigeyan
(ii) Production of tissue culture plants – D. Neelamathi, R. Valarmathi, C. Jayabose
- C1-16/1-1-11 Enhancing Sugar Productivity in Tamil Nadu through Institute-Industry Participatory Approach (SISMA funded)**
(Start: Jul 2016 End: Jun 2021)
PL BAKSHI RAM CoPL C. APPUNU
(a) To conduct varietal evaluation trials for identification of location specific varieties
G. Hemaprabha, A.J. Prabakaran, R.M. Shanthi, S. Alarmelu, P. Govindaraj, D. Neelamathi, S. Karthigeyan, A. Anna Durai, R. Karuppaiyyan, K. Mohanraj, C. Mahadevaiah, V. Sreenivasa, Adhini S. Pazhani, S. Sheelamary, H.K. Mahadevaswamy, T. Lakshmi Pathy, V. Vinu, K. Elayaraja
(b) To undertake survey and surveillance of insect pests and diseases in sugarcane
R. Viswanathan, A. Ramesh Sundar, P. Malathi, C. Sankaranarayanan, R. Selvakumar, V. Jayakumar, K. Nithya, R. Gopi, K.P. Salin, J. Srikanth, N. Geetha, B. Singaravelu, T. Ramasubramanian, M. Punithavalli, P. Mahesh
- C1-18/1-1-12 Identification of location specific sugarcane varieties suitable for different agro-climatic zones of Tamil Nadu (Cooperative sugar factories)**
(Start: June 2018 End: Jun 2021)
PL Bakshi Ram CoPL G. Hemaprabha
S. Alarmelu, S. Karthigeyan, A. Anna Durai, R. Karuppaiyyan, K. Mohanraj, C. Appunu, C. Mahadevaiah, V. Sreenivasa, S. Sheelamary, H.K. Mahadevaswamy, T. Lakshmi Pathy, K. Elayaraja
- C1-14/1-2-41 Genetic control and genomic selection for important traits in sugarcane, and comparison of elite Indian and Australian germplasm.** (Start: March 2016 End: June 2021)
PL R. Manimekalai
G. Hemaprabha, R. Viswanathan, A. Selvi, K. Mohanraj, S. Vasantha
- C1-17/1-2-43 Sub-cellular targeting of invertase inhibitory proteins: a novel approach to enhance sucrose yield in sugarcane (DST funded under Early Career Research Award)**
(Start: Mar 2018 End: Mar 2021)
PL G.S. Suresha
- C1-17/1-2-44 Identification of salt responsive genes and micro RNA targets from salt tolerant *Erianthus arundinaceus* through transcriptome analysis**
(Start: Mar 2018 End: Mar 2021)
PL C. Mahadevaiah

- C1-17/1-2-45** **Isolation, functional characterization and evaluation of water deficit stress tolerance responsive genes from high drought tolerant *Erianthus arundinaceus* by comparative drought transcriptome analysis.**
(Start: June 2017 End: Dec 2020)
PL C. Appunu
G. Hemaprabha, G.S. Suresha
- C1-17/1-2-46** **Network Project of Transgenics in Crops - Transgenic Development in Sugarcane**
(Start: Jan 2018 End: March 2021)
PL C. Appunu
R. Valarmathi
- C1-19/1-2-47** **Unraveling the molecular mechanism of early maturing responsive genes in sugarcane through transcriptome analysis**
(Start: May 2019 End: June 2022)
PL M. R. Meena
- C1-19/1-2-48** **Novel application of sugarcane vacuolar targeting technology for recombinant protein**
(Start: July 2019 End: March 2021)
PL C. Appunu
G.S. Suresha
- C1-19/1-2-49** **A proteomic approach for identification and characterization of new ligninolytic enzymes for improved sugarcane bagasse delignification (DST-SERB-EEQ/2019/000225)**
(Start: Nov 2019 End: Nov 2022)
PL K. Lakshmi
- C1-20/1-2-50** **Development of white grub (*Holotrichia serrata*) resistance in sugarcane and groundnut by deploying novel Cry toxin holotype genes (NASF/GTR-8020/2020-21)**
(Start: Aug 2020 End: Jul 2022)
PL C. Appunu
B. Singaravelu, K. Hari, G.S. Suresha
- C1-19/1-2-51** **Potential application of genomic *in situ* hybridization (GISH) to understand the genomic constitution of *Saccharum* hybrids (DST-SERB-EEQ/2019/000124)**
(Start: Nov 2019 End: Nov 2022)
PL V.P. Sobhakumari
- C1-19/2-1-29** **Doubling Income of Small Farms through Sugarcane Based Farming System (NADP/RKVY)**
(Start: Jan 2019 End: March 2021)
PL P. Geetha
T. Rajula Shanthi, C. Palaniswami, A.S. Tayade and L. Saravanan
- C1-18/2-1-30** **NFSM demonstration of pulses intercropping with sugarcane**
(Start: Nov 2018 End: Continuous)
PL A.S. Tayade
P. Geetha, S. Anusha, D. Puthira Prathap
- C1-17/2-2-24** **Characterisation of root system traits in sugarcane germplasm (DST funded under Early Career Research Award)**
(Start: Mar 2018 End: May 2021)
PL V. Krishnapriya

- C1-17/3-1-20** **A whole genome based reduced representation approach for identification of resistance against sugarcane yellow leaf virus in Indian sugarcane.**
(Start: 2018 End: 2021)
PL B. Parameswari
- C1-17/3-1-22** **ICAR-CRP on Development and application of diagnostics to viruses and phytoplasmas infecting sugarcane**
(Start: Nov 2017 End: March 2025)
PL R. Viswanathan
B. Parameswari, D. Neelamathi and K. Nithya
- C1-17/3-1-23** **Dissecting the molecular interface between the biotrophic pathogen *Sporisorium scitamineum* and its host - Sugarcane (DBT project)**
(Start: Jan 2018 End: Dec 2020)
PL A. Ramesh Sundar
R. Viswanathan, P. Malathi, P.T. Prathima
- C1-18/3-1-24** **Deciphering *in planta* secretome of *Sporisorium scitamineum* x sugarcane interaction (DST-SERB)**
(Start: July 2018 End: June 2021)
PL A. Ramesh Sundar
R. Viswanathan and G. S. Suresha
- C1-18/3-1-25** **Deciphering interacting partners of PAMPs/ Effectors of *Colletotrichum falcatum* that trigger innate immunity in sugarcane (DBT project)**
(Start: Aug 2018 End: Aug 2021)
PL A. Ramesh Sundar
R. Viswanathan, P. Malathi, C. Appunu & Dr. Rajeev Sukumaran, NIIST, Trivandrum
- C1-19/3-1-26** **Development of sugarcane bacilliform virus (SCBV) based VIGS vector for functional genomics in sugarcane (DST-SERB)**
(Start: March 2019 End: March 2022)
PL R. Viswanathan
B. Parameswari, C. Appunu, K. Nithya
- C1-19/3-1-27** **Biogenesis of nanomaterials from effective *Trichoderma* spp. for the management of red rot disease in sugarcane (DST-SERB-TARE)**
(Start: Oct 2019 End: Oct 2022)
PL P. Malathi (Mentor)
V. Bhuvaneshwari (KASC, BU, CBE)
- C1-19/3-1-28** **Development of recombinase polymerase amplification combined lateral flow dipstick kits for rapid detection of major viruses infecting sugarcane (DST-Women Excellence Award)**
(Start: Mar 2020 End: Mar 2023)
PL B. Parameswari
- C1-19/3-6-1** **Establishment of native entomo-pathogenic nematodes as potential bio-pesticide to tackle the exotic invasive pest fall armyworm menace (DST-SERB-TARE)**
(Start: Dec 2019 End: Nov 2022)
PL C. Sankaranarayanan (Mentor)
N. Seenivasan (TNAU, CBE), B. Singaravelu

- C1-19/4-1-1 Sugarcane based Agri-Business Incubator (ABI) (National Agricultural Innovation Fund Scheme (NAIF) - Component II, IP & TM, ICAR)**
 (Start: April 2019 End: Continuous)
 PL P. Murali
 V. Venkatasubramanian, K. Hari, A.J. Prabakaran, G.S. Suresha,
 D. Puthira Prathap, Bakshi Ram
- C1-20/4-1-2 Intellectual Property Management and Technology Transfer/ Commercialization – Institute Technology Management Unit (ITMU) (National Agricultural Innovation Fund Scheme (NAIF) - Component I, IP & TM, ICAR)**
 (Start: 2008 End: Continuous)
 PL K. Hari
 K. Rathnavel (CICR RS, Coimbatore), G. Hemaprabha, J. Srikanth,
 A. Ramesh Sundar, P. Murali, Bakshi Ram
- C1-16/5-1-22 Need based technological interventions under Tribal Sub Plan in selected tribal villages (Ministry of Tribal Affairs)**
 (Start: 2014 End: Continuous)
 PL T. Rajula Shanthy
 C. Sankaranarayanan, R. Karuppaiyan, C. Jayabose, R. Arunkumar
- C1-07/6-1-20 Identification, characterization and verification of new sugarcane varieties for DUS testing**
 (Start: 2007 End: Mar 2021)
 PL M. R. Meena
 Ravinder Kumar
- C1-07/6-1-21 ICAR Seed project – Seed production in agricultural crops and fisheries – sugarcane (RFS, Karnal)**
 (Start: 2007 End: Continuous)
 PL Ravinder Kumar
- C1-18/6-1-22 Healthy seed production and mechanization of sugarcane agriculture - A farmers participatory initiative (RKVY Haryana)**
 (Start: 2018 End: 2022)
 PL Ravinder Kumar
 M.R. Meena, M.L. Chhabra, S.K. Pandey, B. Parameswari, Pooja
- C1-18/6-1-23 Sugarcane Breeder Seed production and demonstration of intercropping (NFMS-CC)**
 (Start: 2014 End: 2021)
 PL Ravinder Kumar
 M.R. Meena
- C1-07/11-1-2 DUS testing of sugarcane (Agali)**
 (Start: Feb. 2007 End: Continuous)
 PL R. Karuppaiyan
 V. Sreenivasa

CONTRACT RESEARCH PROJECTS

CRP-20/3-2-2 Evaluation of entomopathogenic fungi against white grub, *Holotrichia serrata* and whitefly, *Aleurolobus barodensis* infesting sugarcane

(Start: Aug 2020 End: Aug 2022)

PL N. Geetha

K. P. Salin

LIST OF NEW INSTITUTE SUB-PROJECTS

P1-15/1-1 (ix) Marker – assisted selection in sugarcane for drought tolerance and red rot resistance (Start: Jul 2020 End: May 2024)

G. Hemaprabha, H.K. Mahadevaswamy, K. Mohanraj, C. Appunu, R. Viswanathan, R. Manimekalai

(x) Standardization of accelerated flowering in sugarcane for speed breeding (Start: Jul 2020 End: Jul 2021)

K. Mohanraj, R. Arun Kumar

P1-15/1-2 (xiv) Targeted prebreeding with different cytotypes of *Saccharum spontaneum* L. characterized for abiotic stress tolerance

(Start: Jul 2020 End: Dec 2024)

S. Sheelamary, S. Karthigeyan, V.P. Sobhakumari

(xv) Identification of multiratooning potential of selected interspecific and intergeneric hybrids of *Saccharum* spp.

(Start: Jan 2021 End: Dec 2024)

K. Elayaraja

P1-15/1-4 (vii) CSISPR/Cas9-mediated targeted mutagenesis in sugarcane

(Start: Jul 2020 End: Jun 2023)

C. Appunu, R. Valarmathi

(viii) Deciphering the molecular mechanism regulating tillering in sugarcane through functional genomics approach

(Start: Jul 2020 End: May 2023)

R. Valarmathi, K. Mohanraj, C. Appunu

P1-15/2-2 (viii) Plant architectural traits for developing ideotype concept in sugarcane for tropical conditions (Start: Jul 2020 End: Jul 2023)

S. Vasantha, G. Hemaprabha, S. Alarmelu, K. Mohanraj, R. Arun Kumar, V. Sreenivasa, V. Krishnapriya, S. Anusha

(vix) Development of hydroponic screening methodologies for sugarcane varietal evaluation in response to abiotic stress under controlled condition (Start: Jul 2020 End: Jun 2024)

R. Arun Kumar, V. Krishnapriya, S. Vasantha, K. Hari

P1-15/2-3 (viii) Standardization of nutrient management package for sugarcane under wide-row planting in calcareous soil

(Start: Feb 2020 End: Jan 2023)

A. Vennila, C. Palaniswami, I. Rajendran, G. Hemaprabha

P1-15/3-2 (xvi) Prospects for conjunctive use of *Telenomus dignus* and *Cotesia flavipes* against internode borer
(Start: Jul 2020 End: Jun 2023)
J. Srikanth, P. Mahesh, K.P. Salin, L. Saravanan

(xvii) Formulation and field application of *Metarhizium anisopliae* (Metchnikoff) Sorokin (1883) as a mycoinsecticide
(Start: Aug 2020 End: Jul 2021)
N. Geetha, K.P. Salin, T. Ramasubramanian

(xviii) Early detection of mechanism of resistance operating in sugarcane intergeneric hybrids against shoot borer, *Chilo infuscatellus* (Snellen) and internode borer, *Chilo sacchariphagus indicus* (Kapur) (Lepidoptera: Crambidae)
(Start: Jul 2020 End: Jul 2023)
M. Punithavalli, K.P. Salin, K. Mohanraj

P1-15/4-1 (v) Developing “SugarcanePedia” – an user friendly knowledge system management for strengthening sugarcane research and development (Start: Sep 2020 End: Aug 2023)
Bakshi Ram, P. Murali, T. Arumuganathan, D. Puthira Prathap, V. Venkatasubramanian

P1-15/5-1 (v) Evaluating the effectiveness of state-level sugarcane R & D workshops – A cross-state assessment
(Start: Jun 2020 End: Jun 2022)
D. Puthira Prathap, P. Murali

LIST OF NEW MULTI-DISCIPLINARY PROJECTS

P2-20/12-3 All India Coordinated Research Project on Biological Control
(Start: Aug 2020 End: Jul 2022)
PL N. Geetha
P. Malathi

LIST OF CLOSED INSTITUTE SUB-PROJECTS AND/OR ACTIVITIES

P1-15/1-2 (ii) Cytological behaviour in the interspecific hybrids derived with different cytotypes of *S. spontaneum*
(Start: Oct. 2014 End: Dec. 2019)
A. Suganya, R. Karuppaiyan

(vii) Characterization and mining genetic variability in sugarcane germplasm against abiotic stress (Salinity / alkalinity and low temperature) under subtropical India (Karnal) (Start: March 2015 End: March 2020)
Ravinder Kumar, M.R. Meena, A. Selvi, Pooja

P1-15/1-3 (iii) Oxidative stress tolerance in light of climate change: Gene discovery and regulation by micro RNAs in *Erianthus sp.* and *Saccharum spontaneum*
(Start: Oct. 2014 End: Sept. 2019)
R. Manimekalai, A. Selvi, R. Gomathi

- P1-15/2-1** **(v) Characterization of rhizosphere of selected sugarcane genotypes**
(Start: Nov. 2014 End: March 2020)
K. Hari, S. Vasantha, A. Anna Durai, G.S. Suresha
- P1-15/2-2** **(iv) Genotypic behavior of sugarcane under moisture stress in subtropical India** (Start: May 2016 End: Oct 2020)
Pooja, Ravinder Kumar
- P1-15/2-3** **(ii) Development of a Decision Support System for Sugarcane Soil Management**
(Start: Oct. 2014 End: Sept. 2019)
A. Vennila, C. Palaniswami
- (v) Effect of sulphur and micronutrients (zinc, iron and boron) application on yield and quality of sugarcane (variety Co 0238) under sub-tropical condition**
(Start: April 2018 End: Mar 2021)
K. Rajasekar, Ravinder Kumar, Pooja
- P1-15/3-2** **(i) Host plant factors influencing genotypic reaction to shoot borer *Chilo infuscatellus***
(Start : April 2013 End: March 2020)
M. Punithavalli, K.P. Salin
- (viii) Development of DNA barcodes and species-specific markers for insects in sugarcane ecosystem**
(Start : Nov. 2013 End : Nov 2019)
T. Ramasubramanian, K. Ramaraju (TNAU), S.K. Pandey
- (ix) Studies on the prospects of *Telenomus* sp. as a candidate biocontrol agent of internode borer**
(Start: May 2016 End: March 2020)
J. Srikanth, P. Mahesh, K.P. Salin, L. Saravanan
- (x) Bio intensive management of white grub in sugarcane**
(Start: May 2016 End: April 2020)
N. Geetha, K.P. Salin, M. Punithavalli, C. Sankaranarayanan
- P1-15/4-1** **(ii) A feasibility study of recommended sugarcane production and protection technologies for promoting rural entrepreneurship** (Start: Apr 2017 End: Mar 2020)
V. Venkatasubramanian, P. Murali, D. Puthira Prathap, T. Arumuganathan
- (iii) Socio-economic impact of ICAR-SBI varieties and production technologies in different agro-climatic zones of India** (Start: Jun 2017 End: May 2020)
P. Murali, V. Venkatasubramanian, Ravinder Kumar, K. Elayaraja

LIST OF CLOSED MULTI-DISCIPLINARY SUB-PROJECTS AND/OR ACTIVITIES

- P1-15/12-1** (e) Apomixis – P.T. Prathima, C. Appunu
(h) Agronomic practices for seedlings / settlings – A.S.Tayade, P. Geetha, S. Anusha

LIST OF CLOSED CONTRACT RESEARCH PROJECTS

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LIST OF INSTITUTE SUB-PROJECTS AND/OR ACTIVITIES KEPT IN ABEYANCE

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LIST OF EXTERNALLY FUNDED PROJECTS KEPT IN ABEYANCE

C1-16/5-1-21 **Digital inclusion of rural youth for sustainable development:
a comparative assessment**
(Start: October 2016; End: June 2019)
PL D. Puthira Prathap
P. Murali, V.Venkatasubramanian

PROJECT SUMMARY

I. Institute sub-projects in operation

Division of Crop Improvement	4
Division of Crop Production	3
Division of Crop Protection	3
Statistics & Economics Section	1
Extension Section	1
Multidisciplinary projects	3

Total 15

II. Externally funded projects in operation 34

III. Contract research projects 1

IV. New Institute sub-projects 14

V. New Multi-disciplinary projects 1

VI. Closed Institute sub-projects 13

VII. Closed multi-disciplinary activities 2

VIII. Closed contract research projects Nil

VIX. Institute projects kept in abeyance Nil

X. Externally funded projects kept in abeyance 1
