



TECHNICAL PROGRAM 2021-22



Compiled by
J. Srikanth
G. Hemaprabha



भा.कृ.अनु.प. - गन्ना प्रजनन संस्थान, कोयंबतूर
ICAR - Sugarcane Breeding Institute
COIMBATORE 641007



ICAR - SUGARCANE BREEDING INSTITUTE, COIMBATORE
Updated Technical Program 2021-22

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. Karuppaiyan, A.J. Prabakaran, C. Mahadevaiah (till Sep 2021), S. Sheelamary, T. Lakshmi Pathy, H.K. Mahadevaswamy, V. Vinu, V. Sreenivasa, K. Elayaraja, R.T. Maruthi (from Oct 2021), K. Gopalareddy (from Nov 2021)
- b) Pre Zonal Varietal Trial
 - i) Cane yield and quality – K. Mohanraj, H.K. Mahadevaswamy, C. Appunu, V.Vinu
 - ii) Screening for diseases
Red rot - P. Malathi
Smut – A. Ramesh Sundar
- c) Botanical characterisation and DNA Finger printing of elite selections and varieties
H.K. Mahadevaswamy, G. Hemaprabha
- d) Identification and testing of short duration sugarcane clones – R. Karuppaiyan, 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. Karuppaiyan

(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, M. L. Chhabra

(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

(Start: 1984 End: 2025)

(a) Breeding and selection at Kannur
M. Nisha, K. Chandran, V. Krishnapriya

(b) Testing selected waterlogging tolerant clones at Balrampur Chini Mills (UP)
M. Nisha, K. Chandran, V. Krishnapriya, R. Gopi, B. Mahendran

(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 2022)

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
- (i) Anatomical characterization of *Saccharum* complex and core collections - A. Suganya

(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

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

(Start: April 1973 End: 2025)

K. Chandran, M. Nisha, R. Gopi, 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

(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

(xvi) Cryopreservation of sugarcane genetic resources for long term storage and future utilization

(Start: Nov 2021 End: Oct 2025)

C. Jayabose, R. Valarmathi

(xvii) Strengthening *Saccharum spontaneum* L. genetic resources for productivity enhancement and utilization through core development (Start: Nov 2021 End: Oct 2024)

S. Sheelamary, S. Karthigeyan, C. Jayabose, V. Vinu, T. Lakshmi Pathy, M. Nisha

(xviii) Population improvement and development of sugarcane genetic stocks for high sugar accumulation potential for sub-tropical India

(Start: Oct 2021 End: Long-term, review after five years)

ICAR-IISR, Lucknow:

M. Swapna, Sanjeev Kumar (PI Breed), Sanjeev Kumar (Agri.Bot)

ICAR-SBI, Coimbatore:

V. Sreenivasa

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 2022)

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

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

(Start: July 2018 End: June 2022)

P.T. Prathima, T. Lakshmi Pathy

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

(Start: July 2018 End: June 2022)

K. Deva Kumar, P.T. Prathima

- (viii) **Identification of functionally relevant SSRs and SNPs from drought and oxidative stress responsive transcriptomes of sugarcane and functional validation of key genes for stress tolerance** (Start: Sep 2021 End: Sep 2024)
A. Selvi, R. Manimekalai, K. Lakshmi, P.T. Prathima, K. Deva Kumar
- (ix) **Development of affordable genomic selection tools for sucrose content and genomic prediction models for yield in sugarcane** (Start: Sep 2021 End: Aug 2023)
R. Manimekalai, K. Mohanraj, M.R. Meena, P.T. Prathima
- (x) **Deep sequencing of suppression subtractive libraries for prospecting differentially expressed genes / Transcription factors from the sugarcane hybrids exposed to drought and salinity stress** (Start: Aug 2021 End: Aug 2024)
K. Lakshmi, A. Selvi, R. Gomathi, A. Suganya, K. Deva Kumar

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: December 2022)
C. Appunu, H.K. Mahadevaswamy
- (vii) **CRISPR/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 2022)
ICAR-SBI: T. Arumuganathan, C. Palaniswami, V. Venkatasubramanian, C. Sankaranarayanan,
ICAR-CIAE RC: T. Senthil Kumar & S. Syed Imran
- (vii) **Development of improved planting material of sugarcane by priming with plant growth promoting bacteria and other substances** (Start: October 2017 End: April 2022)
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 2022)
S. Anusha, P. Geetha, T. Ramasubramanian
- (ix) Inter institutional collaborative research project on testing and evaluation of IISR sugarcane machineries under tropical condition**
(Start: Feb 2019 End: Jan 2022)
ICAR-IISR, Lucknow: A.K. Singh,
ICAR-SBI, Cbe: T. Arumuganathan, A.S. Tayade,
ICAR-CIAE RC: T. Senthil Kumar
- (x) Development of tractor operated whole cane harvester**
(Start: Apr 2019 End: Mar 2022)
T. Senthilkumar (ICAR-CIAE RC, CBE),
T. Arumuganathan (ICAR-SBI, CBE),
A.K. Singh and M.K. Singh (ICAR-IISR, Lucknow)
- (xi) Development and promotion of Mini tractor operated sugarcane planters for small-farm mechanization**
(Start: Oct 2021 End: Sep 2024)
T. Arumuganathan, T. Senthilkumar (ICAR-CIAE Regional Center, Coimbatore), S. Anusha
- (xii) Natural farming for sustainable use and management of natural resources to improve productivity in sugarcane based cropping system**
(Start: Oct 2021 End: Dec 2027)
P. Geetha, A.S. Tayade, K. Hari, A. Vennila

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 2022)
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 2022)
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 2022)
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

(ix) 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

(vi) Demonstration of settling transplanting technology for sugarcane

(Start: Nov 2018 End: Continuous)

A. Vennila, S. Anusha, C. Palaniswami

(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

(ix) Diagnosis of nutrient deficiencies and diseases, characterisation of canopy and estimation of biomass in sugarcane using drone based optical images

(Start: Oct 2021 End: Sep 2024)

C. Palaniswami, A. Vennila, I. Rajendran, T. Arumuganathan, R. Viswanathan, A. Anna Durai, K. Mohanraj, G. Hemaprabha, R. Raja (ICAR-CICR Research Center, Coimbatore), A.S. Tayade, R. Arun Kumar

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

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

(Start: Oct. 2014 End: Mar 2022)

- (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 2022)

R. Selvakumar, T. Lakshmi Pathy

(xiii) Epidemiology and management of *Fusarium* diseases in sugarcane

(Start: May 2017 End: Jun 2022)

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

(xv) Smart delivery of agro-inputs using Sett Treatment Device for biotic and abiotic stress management in sugarcane and other vegetatively propagated crops

(Start: Oct 2021 End: Sep 2024)

P. Malathi, R. Viswanathan, A. Ramesh Sundar, R. Selvakumar, V. Jayakumar, K. Nitya, A. Vennila, T. Ramasubramanian, T. Rajula Shanthi (All from ICAR-SBI)
Ravindra Naik (ICAR-CIAE); S.S. Veena (ICAR-CTCRI);
R. Thangavelu (ICAR-NRCB); Priti Sonavane (ICAR-IIHR);
G. Karthikeyan (TNAU)

(xvi) Sugarcane phytoplasma diseases: diagnosis, understanding the molecular mechanism of plant host phytoplasma interactions (Start: Sep 2021 End: Sep 2026)

K. Nithya, R. Viswanathan, R. Manimekalai, M. Punithavalli,
V. Krishnapriya

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 2022)

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

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

(Start: July 2018 End: June 2022)

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, B. Mahendran

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

(Start: Aug 2020 End: Jul 2023)

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
- (xix) **Use of endophytic *Metarhizium anisopliae* and *Beauveria bassiana* in sugarcane pest management**
(Start: Sep 2021 End: Aug 2024)
N. Geetha, K.P. Salin, T. Ramasubramanian

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 2022)

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

- (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

EXTENSION SECTION

HEAD – Dr. T. RAJULA SHANTHY

P1-15/5-1

Transfer of sugarcane technologies

PL T. Rajula Shanthi

- (i) **Utilisation of extension methods and media for effective transfer of sugarcane technologies**

(Start: Dec. 1986 End: Continuous)

T. Rajula Shanthi, 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 (till June 2021)
G. Hemaprabha (July 2021 onwards)
- (a) Inbreeding - G. Hemaprabha, A. Anna Durai, K. Chandran, T. Lakshmi Pathy, V. Vinu
(b) Anther culture - C. Mahadevaiah, H.K. Mahadevaswamy, A. Suganya (ICAR-SBI)
Sanghamitra Samantaray (ICAR-NRRI, Cuttack)
(c) Chromosome elimination - V.P. Sobhakumari, K. Lakshmi
(d) Wide hybridization- R. Karuppaiyan, K. Mohanraj, A. Suganya
(f) Evaluation of hybrids
i. Tropical (Coimbatore) - R.M. Shanthi, S. Alarmelu, R. Karuppaiyan
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

P1-21/12-2 Value addition and product diversification in sugarcane

PL G. Hemaprabha CoPI G.S. Suresha

- (i) **Development of technologies for value-added products from sugarcane** (Start: Sep 2021 End: Sep 2024)
G.S. Suresha, K. Hari, I. Rajendran, K. Chandran, P. Murali
- (ii) **Functional analysis of bioactive compounds from stem extracts of red-fleshed *Sacharum robustum* genotypes for therapeutic applications and their product development**
G.S. Suresha, K. Hari, K. Chandran, V. Sreenivasa

P2-15/12-2 All India Coordinated Research Project (Sugarcane)

(Start: 2015 End: Continuous)

PL Bakshi Ram (till June 2021)
G. Hemaprabha (July 2021 onwards)

CoPI P. Govindaraj

(I) Peninsular Zone

i. Breeding

- (a) IVT - R.M. Shanthi, C. Mahadevaiah
Multiplication & Exchange - K. Mohanraj, K. Elayaraja
(b) AVT-I Plant - S. Alarmelu, Sheela Mary
AVT-II Plant - S. Karthigeyan, V. Vinu
AVT - Ratoon - R. Karuppaiyan, V. Sreenivasa
(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

ii. Fluff Supply / National Hybridization Programme

(Start : 1971 End : 2025)

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

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
- (c) Evaluating efficacy of PSAP for enhancement of sugarcane
growth, yield and quality
(Start: Feb 2021 End: March 2023)
A.S. Tayade, P. Geetha, S. Anusha, V. Krishnapriya, C. Palaniswami

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, N. Geetha
- (b) Survey and surveillance of sugarcane insect pests
K.P. Salin, J. Srikanth, P. Mahesh, 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
- (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
M. L. Chhabra
- (b) Survey of sugarcane diseases naturally occurring in the area on important sugarcane varieties
M. L. Chhabra
- (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
- (f) M. L. Chhabra Efficient delivery of fungicides and other agro inputs to manage major fungal diseases in sugarcane
M.L. Chhabra

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
- (d) Assessment of yield losses caused by borer pests of sugarcane under changing climate scenario
S. K. Pandey

P2-20/12-3

All India Coordinated Research Project on Biological Control

(Start: Aug 2020 End: Jul 2022)

PL N. Geetha

CoPL P. Malathi

P2-06/1-1-10

AICRP on Seed (Crops)

(Start: April 2007 End: Continuous)

PL A.J. Prabakaran

- (i) Breeder seed production – A.J. Prabakaran, N. Rajendra Prasad (till Nov 2021), S. Karthigeyan, V. Sreenivasa (STC) (from Dec 2021)
- (ii) Production of tissue culture plants – D. Neelamathi, R. Valarmathi, C. Jayabose

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
- C1-19/1-2-47 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 2023)
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
- C1-19/1-2-52 CRISPR/Cas mediated targeted editing for virus resistance in sugarcane (DST-SERB-CRG/2020/003761)**
(Start: Dec 2020 End: Dec 2023)
PL C. Appunu
R. Viswanathan, R. Valarmathi
- C1-19/2-1-29 Doubling Income of Small Farms through Sugarcane Based Farming System (NADP/RKVY)**
(Start: Jan 2019 End: March 2022)
PL P. Geetha
T. Rajula Shanthi, C. Palaniswami, A.S. Tayade, M. Thirunavukkarasu (TNAU, Coimbatore)
- 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
- C1-21/2-2-25 Identification of salt tolerant sugarcane clones for commercial cultivation in Haryana (RKVY Haryana)**
(Start: 2021 End: 2024)
PL Pooja,
S.K. Pandey, Ravinder Kumar, M.R. Meena, M.L. Chhabra

- 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
D. Neelamathi and K. Nithya
- C1-18/3-1-24** **Deciphering *in planta* secretome of *Sporisorium scitamineum* x sugarcane interaction (DST-SERB)**
(Start: July 2018 End: Apr 2022)
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: Mar 2022)
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
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)
- C1-19/3-6-1** **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
K. Hari, A.J. Prabakaran, G.S. Suresha, D. Puthira Prathap
- 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
G. Hemaprabha, R. Viswanathan, K. Mohanraj, B. Singaravelu, K. Rathnavel (CICR RS, Coimbatore), C. Palaniswami, J. Srikanth, P. Murali

- C1-16/5-1-21** **Digital inclusion of rural youth for sustainable development: a comparative assessment**
(Start: October 2016; End: Mar 2022)
PL D. Puthira Prathap
P. Murali
- C1-07/6-1-20** **Identification, characterization and verification of new sugarcane varieties for DUS testing**
(Start: 2007 End: Continuous)
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, Pooja
- C1-07/11-1-2** **DUS testing of sugarcane (Agali)**
(Start: Feb. 2007 End: Continuous)
PL R. Karuppaiyan
V. Sreenivasa

GOVERNMENT SCHEMES

- GS-21/5-1-22** **Scheduled Tribe Component (erstwhile Tribal Sub Plan) (Ministry of Tribal Affairs)** (Start: 2014 End: Continuous)
- (a) Implemented developmental programs in selected tribal villages - Phase I (Start: 2014 End: June 2022)
T. Rajula Shanthy, C. Jayabose, C. Sankaranarayanan, R. Arunkumar
- (b) Implementation of developmental programs in selected tribal villages - Phase II (Start: 2021 End: 2024)
D. Puthira Prathap, K. Mohanraj, P. Geetha, V. Sreenivasa
- GS-21/5-1-23** **Development Action Plan for Schedule Caste (DAPSC)**
A. Anna Durai, Arunkumar, P.T. Prathima

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
- CRP-21/2-1-1** **Calibration and validation of digital soil moisture sensor-advanced in comparison with gravimetric method of soil moisture estimation (SKR Agrotech, Wardha, India)**
(Start : Dec 2021 End: Feb 2022)
S. Anusha, R. Arunkumar, K. Hari and C. Palaniswami

PUBLIC-PRIVATE PARTNERSHIP PROJECTS

- PPP-21/3-2-1** **Cloning expression and functional toxicity assay of *cry1D*, *cry2Af* and *vip3Bb* toxin genes from *Bacillus thuringiensis* isolate against Bt-resistant pink bollworm and other important lepidopterans** (Start: Dec 2021 End: Jun 2023)
B. Singaravelu, G.S. Suresha, C. Appunu, J. Srikanth and P. Mahesh (ICAR-SBI)
S. Mohan, M. Saravanakumar, A. Nixon Prabhu, M. Dinesh, M. Venkatachalam (M/s. Rasi Seeds Pvt. Limited, Attur)

LIST OF NEW INSTITUTE SUB-PROJECTS

- P1-15/1-2** **(iv) Collection, Maintenance, Evaluation and Cataloguing of Sugarcane Germplasm at Coimbatore**
(i) Anatomical characterization of *Saccharum* complex and core collections - A. Suganya
- (xvi) Cryopreservation of sugarcane genetic resources for long term storage and future utilization**
(Start: Nov 2021 End: Oct 2025)
C. Jayabose, R. Valarmathi
- (xvii) Strengthening *Saccharum spontaneum* L. genetic resources for productivity enhancement and utilization through core development** (Start: Nov 2021 End: Oct 2024)
S. Sheelamary, S. Karthigeyan, C. Jayabose, V. Vinu, T. Lakshmi Pathy, M. Nisha
- (xviii) Population improvement and development of sugarcane genetic stocks for high sugar accumulation potential for sub-tropical India**
(Start: Oct 2021 End: Long-term, review after five years)
M. Swapna, Sanjeev Kumar, Sanjeev Kumar (All from ICAR-IISR, Lucknow), V. Sreenivasa (ICAR-SBI)

- P1-15/1-3** (viii) **Identification of functionally relevant SSRs and SNPs from drought and oxidative stress responsive transcriptomes of sugarcane and functional validation of key genes for stress tolerance** (Start: Sep 2021 End: Sep 2024)
A. Selvi, R. Manimekalai, K. Lakshmi, P.T. Prathima, K. Deva Kumar
- (ix) **Development of affordable genomic selection tools for sucrose content and genomic prediction models for yield in sugarcane** (Start: Sep 2021 End: Aug 2023)
R. Manimekalai, K. Mohanraj, M.R. Meena, P.T. Prathima
- (x) **Deep sequencing of suppression subtractive libraries for prospecting differentially expressed genes / Transcription factors from the sugarcane hybrids exposed to drought and salinity stress** (Start: Aug 2021 End: Aug 2024)
K. Lakshmi, A. Selvi, R. Gomathi, A. Suganya, K. Deva Kumar
- P1-15/2-1** (xi) **Development and promotion of Mini tractor operated sugarcane planters for small-farm mechanization**
(Start: Oct 2021 End: Sep 2024)
T. Arumuganathan, T. Senthilkumar (ICAR-CIAE Regional Center, Coimbatore), S. Anusha
- (xii) **Natural farming for sustainable use and management of natural resources to improve productivity in sugarcane based cropping system**
(Start: Oct 2021 End: Dec 2027)
P. Geetha, A.S. Tayade, K. Hari, A. Vennila
- P1-15/2-3** (ix) **Diagnosis of nutrient deficiencies and diseases, characterisation of canopy and estimation of biomass in sugarcane using drone based optical images**
(Start: Oct 2021 End: Sep 2024)
C. Palaniswami, A. Vennila, I. Rajendran, T. Arumuganathan, R. Viswanathan, A. Anna Durai, K. Mohanraj, G. Hemaprabha, R. Raja (ICAR-CICR Research Center, Coimbatore), A.S. Tayade, R. Arun Kumar
- P1-15/3-1** (xv) **Smart delivery of agro-inputs using Sett Treatment Device for biotic and abiotic stress management in sugarcane and other vegetatively propagated crops**
(Start: Oct 2021 End: Sep 2024)
P. Malathi, R. Viswanathan, A. Ramesh Sundar, R. Selvakumar, V. Jayakumar, K. Nitya, A. Vennila, T. Ramasubramanian, T. Rajula Shanthi, Ravindra Naik
- (xvi) **Sugarcane phytoplasma diseases: diagnosis, understanding the molecular mechanism of plant host phytoplasma interactions**
(Start: Sep 2021 End: Sep 2026)
K. Nithya, R. Viswanathan, R. Manimekalai, M. Punithavalli, V. Krishnapriya

- P1-15/3-2 (xix) Use of endophytic *Metarhizium anisopliae* and *Beauveria bassiana* in sugarcane pest management**
 (Start: Sep 2021 End: Aug 2024)
 N. Geetha, K.P. Salin, T. Ramasubramanian

LIST OF NEW MULTI-DISCIPLINARY PROJECTS

- P1-21/12-2 Value addition and product diversification in sugarcane**
 PL G. Hemaprabha CoPI G.S. Suresha
- (i) Development of technologies for value-added products from sugarcane** (Start: Sep 2021 End: Sep 2024)
 G.S. Suresha, K. Hari, I. Rajendran, K. Chandran, P. Murali
- (ii) Functional analysis of bioactive compounds from stem extracts of red-fleshed *Sacharum robustum* genotypes for therapeutic applications and their product development**
 G.S. Suresha, K. Hari, K. Chandran, V. Sreenivasa

LIST OF CLOSED INSTITUTE SUB-PROJECTS AND/OR ACTIVITIES

- P1-15/1-2 (xi) Molecular cytogenetic characterization of interspecific and intergeneric hybrids of *Saccharum***
 (Start: July 2017 End: July 2021)
 V. P. Sobhakumari, K. Mohanraj
- P1-15/1-3 (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
- P1-15/1-4 (v) Differential Gene Expression Studies on *Saccharum spontaneum* in Response to Salinity Stress Tolerance**
 (Start: June 2017 End: March 2021)
 K. Lakshmi, S. Vasantha
- P1-15/2-3 (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
- P1-15/3-1 (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
- (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

P1-15/3-1 (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

P1-15/4-1 (i) An economic analysis on sugar recovery in different states in India (Start: April 2016 End: March 2021)

P. Murali, D. Puthira Prathap

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

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)
P. Murali, T. Arumuganathan, D. Puthira Prathap

LIST OF GOVERNMENT SCHEMES KEPT IN ABEYANCE

C1-18/6-1-23 Sugarcane Breeder Seed production and demonstration of intercropping (NFSM-CC)

(Start: 2014 End: 2021)

PL Ravinder Kumar

M.R. Meena

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PROJECT SUMMARY

Institute 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	5

Total 17**Externally funded projects in operation 21****Government Schemes 2****Contract research projects 2****Public-private partnership projects 1****New Institute sub-projects 13****New Multi-disciplinary projects 2****Closed Institute sub-projects 10****Institute subprojects kept in abeyance 1****Government schemes kept in abeyance 1**
