

Journey behind the success of Mechanized Priming Technology

1. Name: P. MALATHI
2. Age: 57 years
3. Gender: Female
4. Father's Name: S. PALANIYANDI
5. Address: Principal Scientist (Plant Pathology)
Division of Crop Protection
ICAR-Sugarcane Breeding Institute
Veerakeralam, Coimbatore – 641007
Tamil Nadu, India
6. Contact No: 09487022404
7. Email. ID: emalathi@yahoo.com; Malathi.P@icar.gov.in
8. Work done/ Innovations/ Achievements (Brief Note in 250 words)

“Mechanized Priming Technology for Healthy Nursery Programme and Disease Management in Sugarcane and other vegetatively propagated crops”

As sugarcane is an annual crop with ratooning behavior and propagated by vegetative means, any kind of pathogen infection in the stalk is transmitted to main field through the seed cane. Though our research findings strongly support prolonged treatment in fungicide solution, there exists practical difficulty in handling voluminous planting material. Hence, mechanized means of treating setts by vacuum infiltration technology was conceptualized in 2001-02, validated during 2002-2010 by developing a prototype wherein the absorption of surrounding solution by vacuum infiltration within 15minutes was found to be equal to overnight soaking. A process patent was filed in this regard in 2011 as **“Rapid treatment for planting materials of sugarcane and other vegetatively propagated crops” (Indian Application No: 3323/CHE/2011)”, which was published on 21/06/2013 in ‘The Patent Office Journal’ for which, Patent has been granted in February’2024.**

During 2012-2015, Institute has fabricated bigger sized units as ‘Sugarcane Sett Treatment Device’ in collaboration with ICAR-CIAE under DST-IDP project to treat setts with fungicides and other agro inputs for disease management and healthy nursery programme for large scale application. Based on which, it was commercialized in 2016 and since then sugar mills and entrepreneurs have come forward and adopted this technology. At present, there are 2 Licensees covering both tropical and sub-tropical regions and around 400 installations were completed all

over India. Our findings established that the mechanized treatment has several advantages viz., rapidity, effectiveness, less cumbersome in handling material, capable of delivering more than one agrochemical/ microbes, uniform treatment with evenly dispersed chemical, economical as it consumes less chemical, ecofriendly as the less quantity of chemical also can be reused and suitability for large scale application under farmer's field conditions as it is a mobile unit.

In addition, it has opened up **new vistas** towards possible adoption of this technology for treating planting materials of **major vegetatively propagated** crops viz., tapioca, banana, potato, turmeric, ginger, floral crops etc. other than sugarcane. For which, **inter-institutional project** has been undertaken with **seven ICAR institutes and TNAU** and receiving encouraging results for integrated pest and disease management.

Although, the technology has been adopted since 2016, the dissemination has been fastened by Government support through **NADP-RKVY at state level in Tamil Nadu** and **Centrally sponsored NFSM at National level**. Realizing the importance of mechanized priming in healthy nursery programme, **subsidy of 40-50%** has been announced for the machinery-Sett Treatment Device by **Ministry of Agriculture and Farmers Welfare**. In Tamil Nadu, Department of Sugar, under **NADP-RKVY-DRP based projects**, Project proposal No.22.11 'Sugarcane Cultivation Development Programme' **approved 100 units** for sugar mills in TN and it is being implemented to develop **100 Entrepreneurs for Healthy Nursery Programme** in all the sugar mills.

Category of Invention: Applicable for all categories

Technology (01)	Product (02)	Process (03)	Machinery (04)	Method (05)
Rapid treatment for planting materials of sugarcane and other vegetatively propagated crops	Healthy Nursery programme and Disease Management in vegetatively propagated crops	Mechanized priming of planting material with various agro-inputs	Mechanized Priming Device/ Sett Treatment Device (MPD/ STD)	Vacuum infiltration principle
Indian Patent No: 3323/CHE/2011 – Awarded in February 2024 (Evidence enclosed)	(Evidence enclosed)	(Evidence enclosed)	(Evidence enclosed)	(Evidence enclosed)

Scientists associated in development: R. Viswanathan, A. Ramesh Sundar, K. Hari and V. Jayakumar

Scientists involved in validation and Dissemination: Ravindra Naik (CIAE); T. Rajula Shanthi, A. Vennila, T. Ramasubramanian, R. Selvakumar & R. Gopi

 INTELLECTUAL PROPERTY INDIA MINISTRY OF LAW, GOVERNMENT OF INDIA	 सत्यमेव जयते	डी.पी.सी. नं. SL No. 044180222 
पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India पेटेंट प्रमाण पत्र Patent Certificate (पेटेंट विन्यासकी का विवरण "A") (Rule 74 of The Patents Rules)		
पेटेंट नं. / Patent No.	:	516028
आवेदन नं. / Application No.	:	3323/CHE/2011
पादल करने की तारीख / Date of Filing	:	26/09/2011
पेटेटी / Patentee	:	INDIAN COUNCIL OF AGRICULTURAL RESEARCH
प्रमाणित किया जाता है कि पेटेटी को, उपरोक्त आवेदन में व्यापकृतित RAPID TREATMENT FOR PLANTING MATERIALS OF SUGARCANE AND OTHER VEGETATIVELY PROPAGATED CROPS नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख सितम्बर 2011 के छहमास्य दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदान किया गया है। It is hereby certified that a patent has been granted to the patentee for an invention entitled RAPID TREATMENT FOR PLANTING MATERIALS OF SUGARCANE AND OTHER VEGETATIVELY PROPAGATED CROPS as disclosed in the above mentioned application for the term of 20 years from the 26th day of September 2011 in accordance with the provisions of the Patents Act, 1970.		
		
अनुदान की तारीख Date of Grant :	:	27/02/2024
		 नियंत्रक, पेटेंट Controller of Patents
टिप्पणी - इस पेटेंट के नवीकरण के लिए बीस, बीस दो वर्ष बाद जहाँ है, सितम्बर 2013 के छहमास्य दिन से बीस वर्ष बाद जहाँ नहीं है उसे फिर दो वर्षों के लिए नवीकरण किया जायेगा। Note - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 26th day of September 2013 and on the same day in every year thereafter.		

Product (02): Healthy Nursery Programme and Disease Management in sugarcane

Sugarcane Sett Treatment Device

Developed against conventional overnight soaking for the management of fungal diseases

MECHANIZED TREATMENT



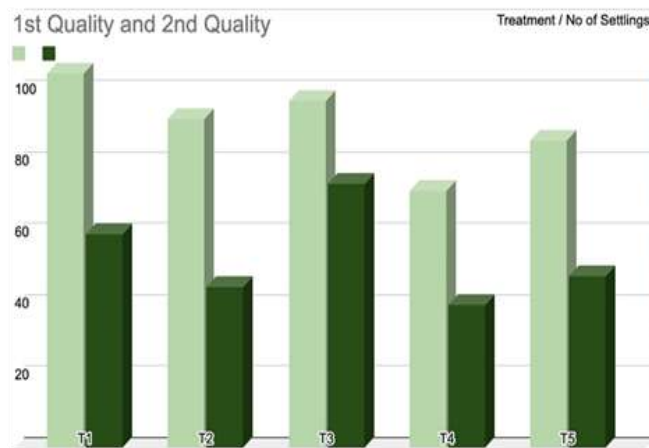
- Simple
- Rapid – 15 – 30 min.
- Effective with uniformity
- Economical – less quantity of inputs
- Ecofriendly – repeated use
- Practically feasible
- Amenable for large scale application
- Able to deliver many inputs at a time
- Protects sugarcane setts from biotic and abiotic stress.

CONVENTIONAL TREATMENT



❖ Adopted by Sugar factories and Entrepreneurs for Healthy Nursery & Disease Management

Process (03): Mechanized priming of planting material with various agro-inputs



- T1 - Carbendazim - 0.05% + Fipronil - 0.05% + Urea - 0.05% + ZnSo4 - 0.05% + FeSo4 - 0.05%
- T2 - Carbendazim - 0.1% + Fipronil - 0.1% + Urea - 0.1% + ZnSo4 - 0.1% + FeSo4 - 0.1%
- T3 - T1 + Liquid biofertilizers - 0.05%;
- T4 - T3 + Humic acid - 0.1%
- T5 - Control

Machinery (04): Mechanized Priming Device/ Sett Treatment Device (MPD/ STD) in different capacities



Method (05): Vacuum infiltration principle



Prototype

9. Relevant supporting documents/ photographs

Research Findings related to the technology

I. Development of prototype and its validation for red rot management **(2002 – 2010)**



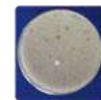
Prototype working under the principle of vacuum infiltration



Overnight soaking



Colletotrichum falcatum



Bioassay to prove infiltration of fungicide



Overnight soaking



Mechanized sett treatment



Inoc. control

Fig.1. Comparative effect of mechanized sett treatment and overnight soaking on uptake and effectiveness of fungicide against red rot and its pathogen

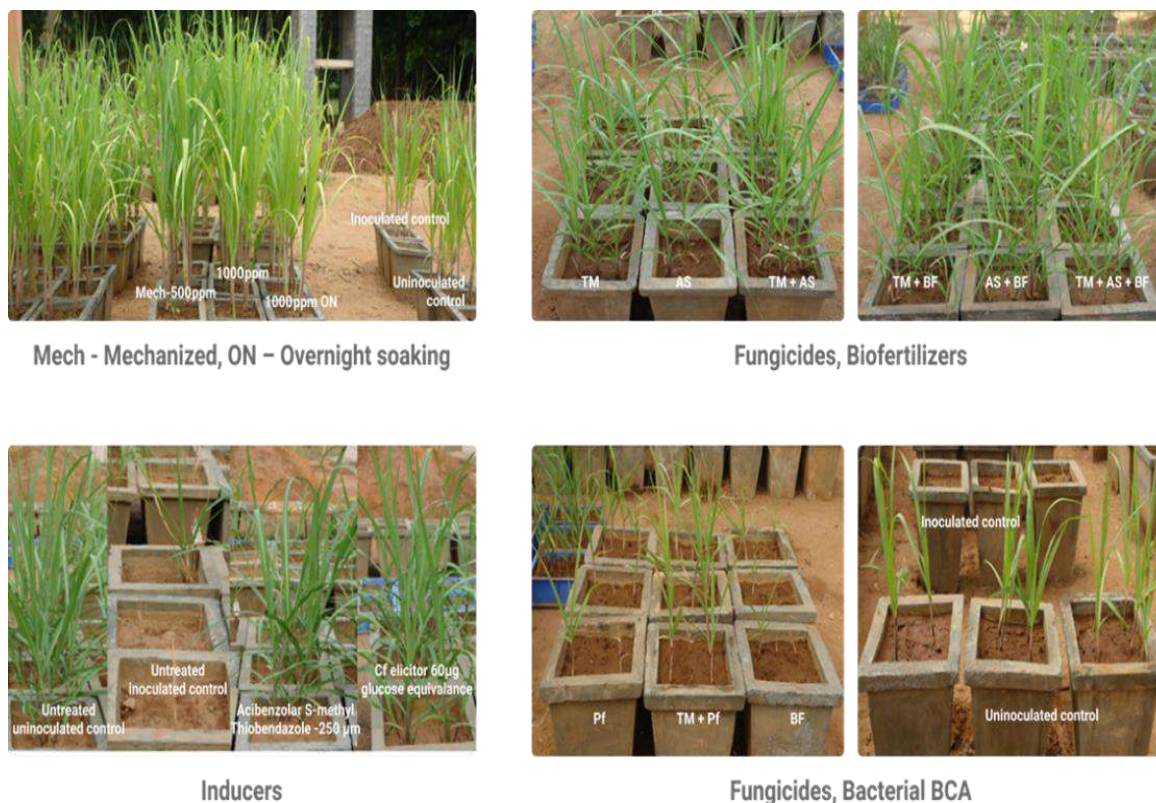


Fig. 2. Validation of prototype with fungicides, inducers, combination with biofertilizers and bacterial biocontrol agents

II. Patent on “Rapid treatment for planting materials of sugarcane and other vegetatively propagated crops” – Filing, Publishing, Awarding (2011 – 2024)

(12) PATENT APPLICATION PUBLICATION	(21) Application No.3323/CHE/2011 A
(19) INDIA	
(22) Date of Filing of Application :26/09/2011	(43) Publication Date : 21/06/2013
(54) Title of the invention : RAPID TREATMENT FOR PLANTING MATERIALS OF SUGARCANE AND OTHER VEGETATIVELY PROPAGATED CROPS	
(51) International classification : A01N	(71) Name of Applicant : INDIAN COUNCIL OF AGRICULTURAL RESEARCH
(31) Priority Document No : NA	Address of Applicant : SUGARCANE BREEDING INSTITUTE COIMBATORE - 641 007 Tamil Nadu India
(32) Priority Date : NA	
(33) Name of priority country : NA	
(86) International Application No : NA	(72) Name of Inventor : 1)PALANIYANDI MALATHI
Filing Date : NA	2)RASAPPA VISWANATHAN
(87) International Publication No : NA	3)PURUSHOTHAMAN PADMANABAN
(61) Patent of Addition to Application Number : NA	4)AMALRAJ RAMESH SUNDAR
Filing Date : NA	5)KTPPUSAMY HARI
(62) Divisional to Application Number : NA	6)VELUSAMY JAYAKUMAR
Filing Date : NA	
(57) Abstract : This invention relates to a novel mechanized method for effective impregnation of any agrochemicals and/or microorganisms and other substances into sugarcane planting materials viz., single two/ three budged sets and bud chips for protection from diseases/ pests and improvement of plant growth. This method is suitable for any planting material like stem cuttings, rhizomes, bulbs and tubers of different vegetatively propagated crops. This method uses vacuum, temperature and agitation at different levels individually or in combination. This method of set treatment is a novel method over conventional method of set soaking. This method has advantages viz., mechanized operation, rapidity, effectiveness, amenable for large scale application, capable of delivering more than one agrochemical/ microbes, uniform impregnation of agrochemical/microorganisms into seed material, possibility to combine physical and chemical method of treatment and lesser requirement of agrochemical.	

 GOVERNMENT OF INDIA Copyright Control of Patents, Designs and Trademarks Department of Industrial Policy and Innovation Ministry of Commerce and Industry	
Application Details	
APPLICATION NUMBER	3323/CHE/2011
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	26/09/2011
APPLICANT NAME	INDIAN COUNCIL OF AGRICULTURAL RESEARCH
TITLE OF INVENTION	RAPID TREATMENT FOR PLANTING MATERIALS OF SUGARCANE AND OTHER VEGETATIVELY PROPAGATED CROPS
FIELD OF INVENTION	BIOTECHNOLOGY
E-MAIL (As Per Record)	
ADDITIONAL-E-MAIL (As Per Record)	vjay52in@yahoo.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	NA
REQUEST FOR EXAMINATION DATE	05/03/2015
PUBLICATION DATE (U/S 11A)	21/06/2013
FIRST EXAMINATION REPORT DATE	26/12/2018
Application Status	

Published – 2013; FER issued – 2018;
2022 – NBA submitted; Hearing Over

The Patent Office Journal 21/06/2013

14785

Fig. 3. Patent filed and published in 2013

<u>THE PATENTS ACT, 1970 (as amended)</u> and <u>THE PATENTS RULES, 2003 (as amended)</u>		10. Therefore, keeping in view the above facts, the submissions of the agents during hearing and subsequently through the written submission, it is, therefore, decided that the application 3323/CHE/2011 is in ORDER FOR GRANT OF PATENT under the provisions of Section 15 and 43(1) of The Patents Act, 1970 (as amended) and will be granted after the submission of NBA approval.	
SECTION 43 In the matter of application for patent Application No. 3323/CHE/2011 Dated 26/09/2011		11. This is to be noted that the aforesaid observations, and decision thereof, are based solely on the electronically uploaded documents to date. Dated, 06th day of June, 2023	
Applicant	:	Indian Council Of Agricultural Research	(MEENAKSHI YADAV)
Having address for service as	:	Lakshmikumaran & Sridharan, 2, Wallace Garden, 2nd Street, Chennai - 600 006, India.	Assistant Controller of Patents & Designs
Appeared	:	Ms. Malathi Lakshmikumaran (IN/PA-1433)	
DECISION 1. An application for patent bearing number 3323/CHE/2011 was filed in Patent office, Chennai on 26/09/2011. The request for examination was filed vide RQ No. 2049/RQ-CHE/2015 dated 05/03/2015 under section 11B and rule 24B of the Patents Act, 1970 (as amended) and the Patents Rules, 2003 (as amended). The said application was published on 21/06/2013 with Journal number of publication 25/2013. The said application was examined under sections 12 and 13 of			

Fig. 4. Patent principally approved in 2023 and awarded in 2024

III. Fabrication of Sett Treatment Devices, its validation, commercialization and Adoption (2012-2022)



Fig. 5a. Demonstration of prototype before the DST-IDP committee for fabricating bigger units in association with CIAE (2013)



Fig. 5b. Fabricated bigger units and named as Sett Treatment Device

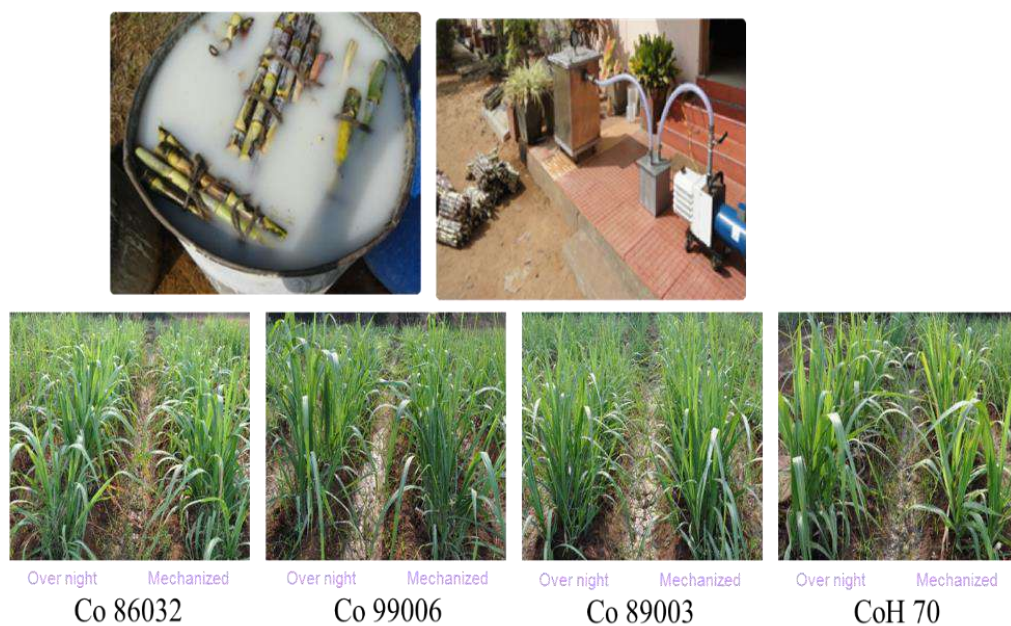


Fig. 6a. Comparison of overnight soaking and mechanized treatment with fungicide on sett germination and wilt management across genotypes (>500)



Fig. 6b. Validation of mechanized sett treatment for wilt management in NHG at the Institute



Fig. 6c. Validation of mechanized sett treatment for red rot and smut management in factory areas

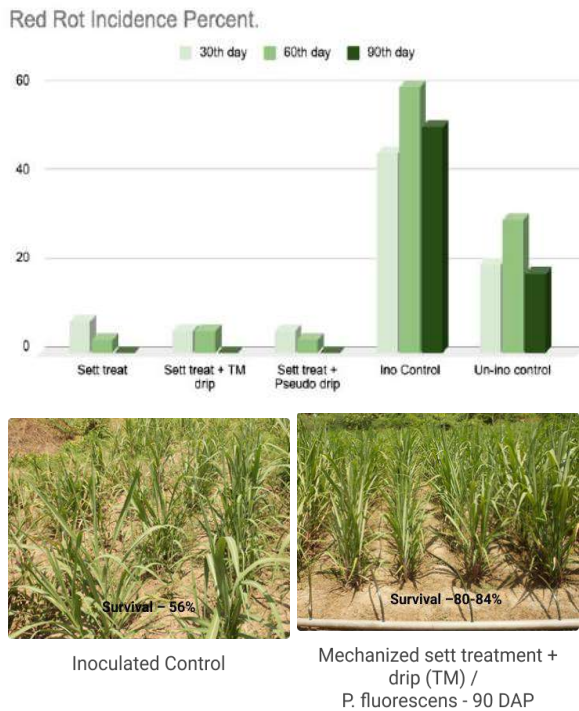


Fig. 6d. Integrated management of red rot by mechanized sett treatment with thiophanate methyl and drip delivery of bacterial antagonist



Fig. 6e. Efficacy of mechanized sett treatment and spraying of propiconazole for smut management in factory areas

Commercialization of the Technology (2016 and 2020)



Licensee – 1
-2016



Licensee – 2
- 2020

ADRINNOVATE - 2020



Fig. 7. Commercialization of the technology in 2016 from the institute and through Agrinnovate, since 2020



Fig.8. Adoption by sugar mills and Entrepreneurs all over India for Healthy Nursery Programme and Disease management

iv. Dissemination of the Technology

a. Statewide – Tamil Nadu

P20.38. Mechanized priming of planting material and technology popularization for revival of sugarcane productivity in Tamil Nadu



NADP-RKVY Sugar Mills

Under NADP-RKVY, supplied STD units (Co-operative), conducted trainings and demonstrations for healthy nursery programme for the management of early season pests and diseases

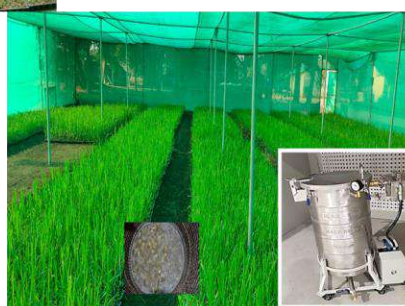


Fig.9. Statewide Dissemination of technology in Tamil Nadu Sugar Mills

Subsidy of 40-50% granted under SMAM-Operational Guidelines – 2024

By Ministry of Agriculture and Farmers Welfare, New Delhi

Annexure-I

Pattern of Assistance and Maximum Permissible Subsidy				
Type of Agricultural Machinery	For SC, ST, Small & Marginal farmers, Women and NE States beneficiary		For other beneficiary	
	Maximum Permissible subsidy per Machine/ Equipment per beneficiary (Rs in Lakhs)	Pattern of Assistance	Maximum Permissible subsidy per Machine/ Equipment per beneficiary (Rs. in Lakhs)	Pattern of Assistance
Tractors				
(i) Tractor 2WD (up to 20 PTO HP)	2.00	50%	1.60	40%
(ii) Tractor 4WD (up to 20 PTO HP)	2.45	50%	1.96	40%
(iii) Tractor 2WD (above 20 PTO HP and up to 40 PTO HP)	3.00	50%	2.4	40%
(iv) Tractor 4WD (above 20 PTO HP and up to 40 PTO HP)	3.60	50%	2.88	40%
(v) Tractor 2WD (above 40 PTO HP and up to 50 PTO HP)	4.50	50%	3.60	40%
(vi) Tractor 4WD (above 40 PTO HP and up to 50 PTO HP)	5.45	50%	4.36	40%
(vii) Tractor 2 WD (Above 50 PTO HP)	6.00	50%	4.80	40%
(viii) Tractor 2 WD (Above 50 PTO HP)	6.50	50%	5.20	40%
Power Tillers				
(i) Power Tiller (8 BHP and up to 11 BHP)	1.00	50%	0.80	40%
(ii) Power Tiller (Above 11 BHP)	1.20	50%	1.00	40%
Combine Harvesters				
(i) Combine Harvester (self-propelled)	9.60	50%	7.68	40%
(ii) Combine Harvester -Tractor	3.60	50%	2.88	40%

Plant Protection Equipments				
(i) Manual sprayer- Knapsack/foot/Battery operated sprayer.	0.01	50%	0.008	40%
(ii) Solar powered Knapsack Sprayer	0.02	50%	0.016	40%
(iii) Bullock Cart mounted solar powered high clearance sprayer	0.40	50%	0.32	40%
(iv) Bullock Cart mounted air mist canopy sprayer	0.48	50%	0.384	40%
(v) Powered Knapsack sprayer/Power Operated sprayer (capacity 8 - 12 litres)- ≤ 0.75 hp engine)	0.03	50%	0.024	40%
(vi) Powered Knapsack sprayer/Power Operated sprayer (capacity above 12- 16 litres): (> 0.75 to 1.00 hp engine)	0.04	50%	0.032	40%
(vii) Powered Knapsack sprayer/Power Operated sprayer (capacity above 16 litres (> 1.0 hp engine)	0.10	50%	0.08	40%
(viii) Powered Knapsack Mist blower sprayer cum Duster (≥ 1.0 hp engine)	0.10	50%	0.08	40%
(ix) Tractor Operated Sprayer (air carrier/assisted)	1.38	50%	1.104	40%
(x) Battery operated Sprayer (Boom Type)	0.05	50%	0.04	40%
(xi) Battery Operated Boom Sprayer (walk behind type)	0.05	50%	0.04	40%
(xii) Tractor Operated Sprayer (boom type)	0.41	50%	0.328	40%
(xiii) Eco Friendly Light Trap	0.02	50%	0.016	40%
(xiv) Solar insect trap	0.04	50%	0.032	40%
(xv) Tractor Operated Electrostatic Sprayer	2.50	50%	2.00	40%
(xvi) Bird Scarer	0.75	50%	0.60	40%
(xvii) Self-propelled high ground clearance sprayers (Boom type)	4.00	50%	3.20	40%
(xviii) Tractor mounted precision spraying machines	3.50	50%	2.80	40%

Page 132				
(xxi) Tractor operated EPN/Bio agent applicator for sugarcane	0.23	50%	0.184	40%
(xxii) Power Operated Sugarcane sett Treatment Device (30 – 120 Litres capacity)	0.30	50%	0.24	40%

Fig. 10. Approval of subsidy for the machinery

3. RKVY/NADP - DRP based projects – Department of Sugar TN

Project Proposal No.22.11: "Sugarcane Cultivation Development Programme" The component wise

details:

Approved and sanctioned 100 units for TN Sugar Mills

Fund released in October'2024

-47-

Project Proposal No.22.11
"Sugarcane Cultivation Development Programme"

Guidelines

B. Reducing the cost of cultivation and increasing sugarcane production

4. Laying of Shade net for bud chip seedlings production

1. To produce quality Bud chip seedlings, shade net is essential. Hence, it is programmed to give assistance for laying of shade net to sugarcane farmers of all Cooperative/Public and Private sector sugar mills and Co-operative/Public sector sugar mills farms.

2. Subsidy Assistance: Rs. 1,30,000/- per shade net.

3. The Managing Directors/ Chief Executives of CSM/PSM will follow TTTTA procedure in laying of Shade net.

4. In respect of Private sector sugar mills Joint Director of Agriculture of concerned districts will float the tenders as per TTTTA procedure.

5. Proper documentation of laying shade net should be maintained by the sugar mills and the same should be shown to the inspecting officers.

Components of Shade net
Area of Shade net: 300 Sq.m

S. No.	Components	Total cost (Rs.)	50 % Subsidy (Rs.)	Specification
1	GI Pipe and fitting	1,00,000	50,000	Main Poles & Frames: 60 mm G.I pipe Lengthwise & Breadth wise: 42 mm G.I pipe
2	Pro-trays	14,000	7,000	1000 Nos of 50 cavity pro-trays with 0.8 mm thickness
3	Coir pith	16,000	8,000	Two MT of good quality coir pith should be purchased from the standard firm
4	Motorized Bud chipper	55,000	27,500	Motor Power – 1HP Bud Production Capacity – 5000 to 6000 Budshour Automation Grade – Semi Automatic Frequency – 50 Hz Phase – Single phase Voltage – 230 V Weight – 110 to 130 kg Corrosion Resistance – Power coated Material of Construction – Mild Steel No of Way – 2 way Overall size (L x W x H) – 1200 x 650 x 760 mm Warranty – 1 year

-48-

5	Sett treatment device (Should be purchased from the licensed manufacturer of ICAR Sugarcane Breeding Institute, Coimbatore or TNAU)	75,000	37,500	Motor Power – 1HP Power Supply – 230 V/ 50 Hz Capacity – 150 litre Pressure Gauge – Yes Dimension L x W x H – 3 x 2.8 x 4 feet SS Mesh Tray – 2 Nos Material construction (SS quality) – SS304 Warranty – 1 year
TOTAL		2,60,000	1,30,000	

Note: If any one of the components cost exceeds the above mentioned amount, that can be adjusted from if there is any savings in other components.

Fig. 11. Development of Entrepreneurship for establishing Healthy Nursery Programme

In Tamil Nadu, since commercialization in 2016, all private mills (15) have procured the units and started healthy nursery programme. However, Co-Operative mills (16) could not adopt the technology due to unawareness. Hence, a project on "Mechanized priming of planting material and technology popularization for revival of sugarcane productivity in Tamil Nadu (p.20.38: 2023-2025)" has been proposed to Tamil Nadu Government, got sanctioned under NADP-RKVY and implemented since 2022. Based on awareness created in sugar mills areas on healthy settling production by mechanized priming, all the selected mills started supplying settlings from setts treated with various agro-inputs. Besides, they requested Government for **subsidy**, which has been **approved** by **Ministry of Agriculture and Farmers Welfare**. Based on that, **Department of Sugar** has sanctioned **100 units** for developing **Entrepreneurship** in all the mills including **Co-operative, Public and Private mills @ 1No. to 6 Nos / sugar mill** and being implemented in all the mills by establishing the nursery units with shade net, STD unit and sett cutting machine. This programme will be completed within this March'2025.

IVb. Nationwide Dissemination

I. AICRP: Confirmed for Management of fungal diseases and Healthy Nursery Programme -2021-2024



अखिल भारतीय समन्वित गन्ना अनुसंधान परियोजना

All India Coordinated Research Project on Sugarcane

भाकृअनुप-भारतीय गन्ना अनुसंधान संस्थान, लखनऊ 226002

ICAR-Indian Sugarcane Research Institute, Lucknow-226 002



डॉ. दिनेश सिंह

परियोजना समन्वयक (गन्ना)

Dr. Dinesh Singh

Project Coordinator (Sugarcane)

F.No. 23-1/PCS/2025

Dated: 19.03.2025

To whom it may concern

This is to certify that the technology on "*Mechanized priming of sugarcane planting materials*" has been validated in AICRP Sugarcane Pathology programme under PP34 section as PP34a: 'To demonstrate efficient delivery of plant protection chemicals or agro inputs/ microbes through mechanized delivery for effective disease management and increased settling vigour' by supplying Sett Treatment Device units to 13 AICRP centres across 4 zones all over India from 2021-22 to 2024-25 and at present, it has been recommended for outreach activities on dissemination of the technology by laying out demo plots in the farmer fields in sugar mill areas.

(Dinesh Singh)

Telephone : +91- 0522-2480787 (Off) EPBAX : +91-0522-2491813
Telefax : +91-0522- 0522-2480787/738 E-mail: pcs.iisr@icar.gov.in, Dinesh.Singh3@icar.gov.in

II. Centrally sponsored Scheme on NFSM-CC from Ministry of Agriculture and Farmers Welfare on
“Dissemination of technology on mechanized priming of planting material for sustainable sugarcane agriculture”

No: 12-7/2020-CU-IV
Ministry of Agriculture & Farmers welfare
Department of Agriculture & Farmers welfare
(Division of Crops & PHMF)

Krishi Bhawan, New Delhi
Dated: 26th July 2024

To,
The Director,
ICAR- Sugarcane Breeding Institute (SBI),
Coimbatore- 641007 (Tamil Nadu).

Subject: Implementation of Centrally Sponsored Scheme on National Food Security Mission- Commercial Crops (NFSM-CC) – Approval of Annual Action Plan (AAP) during 2024-25 – regarding.

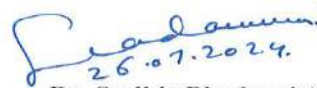
Sir/Madam,

The undersigned is directed to convey the approval of competent authority for implementation of NFSM-CC-Sugarcane in ICAR-SBI, Coimbatore with an allocation of Rs. **5.00 lakh** for the year 2024-25 which is as under:-

S. N	Interventions	Approved rate of assistance	Unit	(Rs. in lakhs)			
				Targets proposed during 2024-25		Targets approved by GOI during 2024-25	
				Phy.	Fin.	Phy.	Fin.
1	Training and Demonstrations to the cane staff/ entrepreneurs/ farmers on “Sugarcane Sett Treatment Device” for healthy nursery and disease management at ICAR-SBI and Sugar mills in different states	50,000/ training @ 100 participants /training	No's (No. of participants)	10 (1000 participants)	5.0 lakhs (10 trainings @ 50,000/ training)	10 (1000 participants)	5.0 lakhs (10 trainings @ 50,000/ training)
Grand Total					5.00		5.00

2. The Institute shall implement the Action Plan as per the norms of NFSM-CC. The Institute should submit Quarterly Progress Report of Physical and Financial achievements to this Ministry on regular basis in hard and soft copies(cropunit4-agri@gov.in, cropunit4@rediffmail.com).

Yours faithfully


26.07.2024.

Dr. Sudhir Bhadauria)
Deputy Commissioner (Crops)

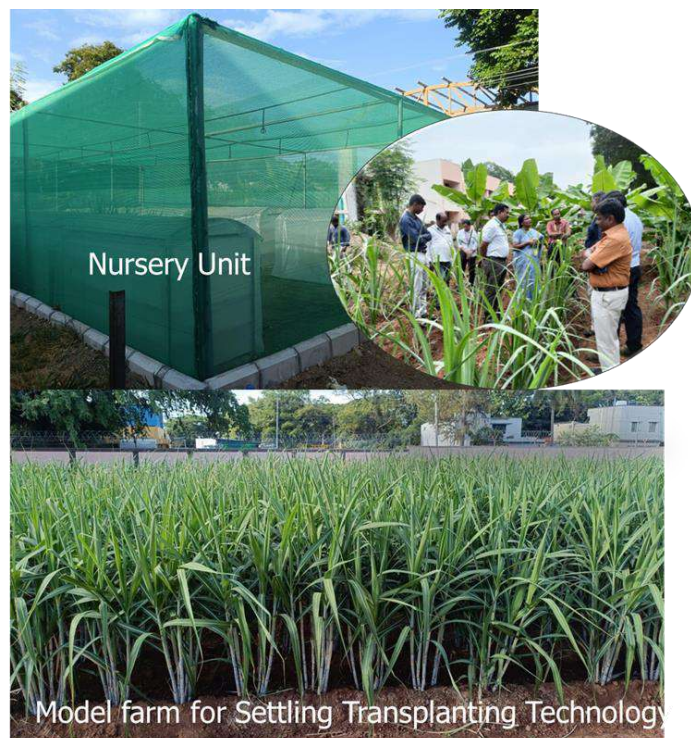
With the support of NFSM, the technology is being disseminated to the Sugar mills, Entrepreneurs and Farmers with the available units in different states viz Bihar and UP, Wherein maximum number of STD units had been procured for the management of red rot in sugarcane.

III. Utilization and Dissemination at the Institute level

Sett Treatment Facility established at ICAR-SBI



Sett Treatment Chamber at ICAR-SBI



At institute level, the mechanized priming technology has been validated in prototype with various agro-inputs (chemicals/ microbes/ hot water) for disease management along with yield improvement during 2001-2011. After fabricating, bigger units, the technology has been validated and demonstrated at the institute level and also at sugar mills, during 2012 – 2016 for the management of various diseases viz., red rot, smut, wilt and pokkah boeng. Since 2013, mechanized priming of planting material with fungicide, insecticide and nutrients in Sett Treatment Device has been followed for disease management particularly for pokkah-boeng and recently the mealy bug. This is considered one of the management strategy as preventive measure under integrated management of soil and sett-borne diseases and to some extent against early season pests in our **National Hybridization Garden, (NHG)** wherein we are maintaining > 500 *Saccharum officinarum* clones for hybridization purpose by various AICRP Research institutes/ Centers from different parts of India. Based on encouraging results from this Garden, the technology is being implemented for various experimental trials especially Museum/ Demo plots for maintaining healthy crop at the institute level. At present, the technology is being applied for treating setts for direct planting as well as for settling production for various experimental fields as routine activity to prevent early season pests and diseases. Sett treatment activity followed in our **Sett Treatment Chamber** is depicted in the following pages. Apart from effective utilization at the Institute level, it is being disseminated by demonstrations to various cadres viz., Scientific and Cane officials and farmers from different states, India.

Sett Treatment Activity at the Institute Sett Treatment Chamber



Process of Mechanized priming of two budded setts with various agro-inputs



Process of Healthy settling development by Mechanized priming of single budded setts with various agro-inputs

IV. Application of the mechanized priming technology in other vegetatively propagated crops



Like sugarcane, the technology was found to be suitable for any planting materials viz., stem cuttings, corms, rhizomes, bulbs and tubers of different vegetatively propagated crops viz., tapioca, banana, ginger, turmeric, potato and horticultural crops as they are generally harbouring pathogen propagules and nematodes. Hence an inter-institutional project entitled **“Smart delivery of agro-inputs using Sett Treatment Device for biotic and abiotic stress management in sugarcane and other vegetatively propagated crops”** has been undertaken with seven ICAR institutes viz., IISR for sugarcane in sub-tropical areas, CTCRI for tuber crops, NRCB for banana, IIHR for floral crops, CPRI for potato, IISR for spices, CIAE for any modifications and TNAU for different crops, initiated validating the device with different agro-inputs for the development of disease free, healthy planting material. Invariably, encouraging results had been obtained from various crops on pest and disease management including sucking pests, nematodes, fungal and non-fungal diseases and proved its efficacy in producing healthy nursery.

IV. Recognition of technology/ Awards

1. Importance of Mechanized sett treatment on Red rot management has been recognized by ICAR.

Integrated Management of Sugarcane Red rot

- Selection of healthy disease free planting material
- **Mechanized sett treatment** with Thiophanate methyl (TPM) at 1000 ppm (0.1%) or TPM at 500 ppm + 0.5% *Paenibacillus alvei* before planting
- Soil drenching or drip delivery of TPM at 0.1% alone or TPM at 500 ppm + 0.5% *Paenibacillus alvei* between 60 to 90 DAP
- If needed, foliar spray with TPM at 0.1% 90 DAP
- Secondary application of fungicide could be continued further by drip delivery/ drone spray frequently during conducive conditions to avoid secondary spread of red rot.
- Soil application of Trichoderma will give additional protection and improve the growth of the crop



Mechanized sett treatment with fungicides/ bioagents and their integration against red rot has been proved under field conditions in both tropical and sub-tropical regions.



2. Smart delivery of agro-inputs in sugarcane planting material by Sett Treatment Device has been recognized by ICAR



Indian Council of Agricultural Research's post



Awards

- Received **Best Oral Presentation award for Scientists** for the oral paper on ‘Vacuum based treatment– An innovative technology of treating planting materials with various agro-inputs for enhanced crop protection’ presented during Golden Jubilee International Conference on “Global Perspectives in Crop Protection for Food Security” conducted during December 8th to 10th by CPPS at TNAU, Coimbatore during 2021.



- Received 'Noel Deer Gold Medal Award' from STAI' 2021 for the research paper presented on "Sett Treatment Device – An effective way of delivering agro-inputs for improved protection and production in sugarcane" by The Sugar Technologists Association of India during 2022



- **Received STAI SILVER MEDAL'2022** for the research paper presented on “Mechanized priming of planting material with physical, chemical, bio-control agents for the management of biotic and abiotic stresses in Sugarcane”



- **‘Pushpavathi Blessing Garapati Gold Medal Award’** awarded for the technical paper entitled "Mechanized Priming of Sugarcane Planting Materials - An efficient and economical way of delivering agroinputs for Healthy Nursery and Main field crop" by SISSTA during August'2024.



- ‘Best paper Award’ for the oral paper on “Mechanized priming of planting material for sustainable sugarcane Agriculture” during 8th International Sugar Conference, Sugarcon’2024 at ICISE, Quy Nhon, Binh Dinh, **Vietnam**.



- **Malathi, P.** 2025. Received “**Best Innovator Award**” in the **INNOVATORS MEET** conducted by ICAR-National Institute of Research on Commercial Agriculture (ICAR-NIRCA) on 8th April’2025.



Copyright for Mechanized priming technology with Sett Treatment Device – USER MANUAL

Intellectual Property Office, Government of India

Copyright Office, Government of India

Copyright Certificate

Rule 78 of The Copyright Rules

Extracts from the Register of Copyrights

Application No.: LD-31494/2025-CO Date of Filing: 06/08/2025

This is to certify that a copyright has been registered for the work titled "Sugarcane Sett Treatment Device User Manual" as disclosed in the below mentioned application in accordance with the provisions of the Copyright Act, 1957.

Author / Authors:	Name	Address
1. F. MALATHI	ICAR-SUGARCANE BREEDING INSTITUTE, COIMBATORE-641007	
2. R. VISWANATHAN	RETIRED, [ICAR-NATIONAL INSTITUTE OF SUGARCANE RESEARCH], LUCKNOW-226025	
3. A. RAMESH SUNDAR	ICAR-SUGARCANE BREEDING INSTITUTE, COIMBATORE-641007	
4. RAVINDRA NAIK	ICAR-CENTRAL INSTITUTE OF AGRICULTURAL ENGINEERING-RS, COIMBATORE-641007	

Owner / Owners:	Name	Address
1. INDIAN COUNCIL OF AGRICULTURAL RESEARCH	ICAR-SUGARCANE BREEDING INSTITUTE, COIMBATORE-641007	

Publisher / Publisher Details:	Name	Address
1. DIRECTOR	ICAR-SUGARCANE BREEDING INSTITUTE, COIMBATORE-641007	

Language of the Work: English / Tamil

Description of the Work: N.A.

Remarks: N.A.

Date of ROC: 05/12/2025

For Additional details please see next page.

Page 1 of 2

Other recognitions

- Implementation of **NADP-RKVY project** on ‘Mechanized priming of planting material and technology popularization for revival of sugarcane productivity **in Tamil Nadu** (2022-2025)’ P20.38.
- Implementation of Centrally sponsored scheme under **National Food Security Mission (NFSM) 2024-25** to popularize mechanized priming technology throughout India
- Approval of **40-50% Subsidy** for the machinery-Sett Treatment Device by **Ministry of Agriculture and Farmers Welfare**

V. Impact of the Technology

• Development of Entrepreneurship for healthy seed crop/ nursery

In all the sugar mills, whoever procured the Sett Treatment Device, have realized the **importance of mechanized priming** and effectively utilizing the technology for raising healthy seed crop or nursery before distributing to the farmers. This activity is being taken up by the sugar mills in their farms or by engaging the farmers as Entrepreneurs. In this regard, with the approval of subsidy of 50% for the machinery, Department of Sugar, Tamil Nadu has sanctioned **100 units for sugar mills in TN to develop Entrepreneurs for healthy nursery programme.**

• Adoption of technology for effective disease management

- So far, about 350 installations, had been completed all over India. Of which, around 120 at UP, 50 in Bihar and currently 140 in Tamil Nadu.
- Healthy nursery programme is being effectively implemented for the management of recent threat on pokkah boeng management in tropical India, particularly Tamil Nadu.
- Similarly, healthy nursery programme is being implemented for the management of red rot in sub-tropical India particularly U.P and Bihar to sustain high yielding with high sugar varieties.

➤ Recommendations

Based on AICRP trials and our research findings, mechanized sett treatment with fungicides is being recommended for the management of sett and soil-borne inoculum of fungal diseases viz., red rot, smut, pokkahboeng and wilt. In endemic areas, along with sett treatment other delivery methods are advocated.

VI. Dissemination of the technology by Trainings and Demonstrations

Conducted field days, trainings, small and large scale demonstrations on mechanized priming of planting materials of sugarcane with various agro-inputs using sett treatment device,

for healthy nursery programme and disease management at the institute as well as in sugar mills for different cadre people including farmers from sugar mills, ATMA, KVK, cane officials, entrepreneurs and officials from different institutes. At the institute level, since 2018 around 50 demonstrations had been conducted and by which around 2000 participants were benefitted from different states viz., Tamil Nadu, Kerala, Andra Pradesh, Karnataka, Maharastra, Punjab, UP, and Bihar. Outside the institute, training cum demonstrations are being conducted to the cane staff, entrepreneurs and farmers in different states viz., Tamil Nadu, Andra Pradesh, Karnataka, UP and Bihar through NADP-RKVY, NFSM and on invitation from sugar mills and Agricultural Department. So far, completed 60 demonstrations in different mills in above said states and remaining 10-15 trainings to be completed soon for Tamil Nadu Entrepreneurs in Tamil Nadu. From above said trainings/ demonstrations in different states, about 2500 participants were benefitted by RKVY (2023 and 2024) in Tamil Nadu, around 750 by NFSM (2024) in UP and Bihar. Apart from which, regular demonstrations were conducted during various Farmer's Mela, since commercialization in 2016.

VII. List of Publications

Research paper

1. **Malathi, P.,** R. Viswanathan and A. Ramesh Sunder. 2017. Mechanized means of sett treatment: An effective way of delivering fungicides for the management of red rot in sugarcane. *Sugar Tech*, 19(2): 176-182.
2. Vennila, A., **P. Malathi***, Riya Augustin, V. Kasthuri Thilagam, C. Palaniswami and R. Viswanathan. 2023. Efficient and economical way of improving sugarcane settling vigour by mechanized priming of single bud setts with nutrients. *Sugar Tech*, 25:1328-1338.
3. **Palaniyandi Malathi,** Rasappa Viswanathan and Amalraj Ramesh Sundar. 2025. Mechanized sett treatment– An innovative technology to deliver various agro-inputs for the management of sugarcane diseases including GSD. *Phytopathogenic Mollicutes*, 15(1): 145-146.

Technical bulletins / pamphlet

Newsletters/ Technical papers

4. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar, C. Naveen Prasanth, Ravindra Naik and Jacob Annamalai. 2015. A new technology for rapid treatment of sugarcane planting material. *SBI News*, Vol. 35(3): 3-5.
5. **Malathi P.,** R. Viswanathan, A. Ramesh Sundar, C. Naveen Prasanth, Ravindra Naik and S.J.K. Annamalai (2017). Package for sett treatment device to treat setts/ budchips. *SBI News*, 37 (3): 4-5.
6. **Malathi, P.,** R. Viswanathan, Ravindra Naik and S.J.K. Annamalai. 2017. Application of Sett Treatment Device in Sugarcane, In Hindi (Beej Tukdon ko Upchar Karne vala Yantr: Rog

Prabandhn ke liye Krishi Niveshkon Ka Prabhavshali Roop mein Upyog Karne ke Liye Nai Takneek Jisse Savasth Podhon ko Utpadit Kiya ja Sake). Gannaprakasha, 2(2): 14.

7. **Malathi P.** and Viswanathan, R. (2019). ‘A new technology for sugarcane sett treatment’ In: 101 Recent agricultural technologies (Tamil). Extension publication No. 27(2018). ISBN 978-93-85267-20-8. pp. 19.
8. **Malathi P.** and Viswanathan, R. (2019). ‘Effective sett treatment for fungal disease management in sugarcane’ In: 101 Recent agricultural technologies (Tamil). Extension publication No. 27(2018). ISBN 978-93-85267-20-8. pp. 20.
9. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar, Ravindra Naik, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2021. Sugarcane Sett Treatment Device – An effective tool for the management of fungal diseases and healthy nursery programme. **SBI NEWS** 41(3): 1-3.
10. Viswanathan, R. **P. Malathi,** C. Naveen Prasanth, Ravindra Naik and S.J.K. Annamalai (2017). Sett way of growing sugarcane for fungal treatment. **ICAR NEWS** 23 (2) 1-3.

Training Lectures

11. **Malathi, P.** 2016. *Nilayana karumbu sagubadikku valamana natrangaal*. In: Naveena Karumbu sagupadi muraigal (Tamil), SBI/NABARD/2016/TA/01 pp79-81.
12. **Malathi. P.** 2023. “Management of diseases in sugarcane” In: ‘Quality seed production through micropropagation in sugarcane’ (Eds. D. Neelamathi, C. Jayabose and G. Hemaprabha). ICAR-Sugarcane Breeding Institute, pp. 71-82.
13. **Malathi, P.** 2023. “Sett Treatment Device: An effective to deliver agroinputs into the planting materials of sugarcane”. In: ‘Advances in Sugarcane cultivation’ (Eds.T. Rajula Shanthi and G. Hemaprabha), ICAR-Sugarcane Breeding Institute, pp. 135-137.
14. **Malathi, P.** 2023. Integrated Disease Management in Sugarcane. In: Improved Sugarcane Production Technologies. (Eds. D. Puthira Pratap, and P. Murali), ICAR-Sugarcane Breeding Institute, (ICAR-SBI Training Series: 2023/E/1), pp. 146-157.
15. **Malathi, P.** and A. Ramesh Sundar. 2023. Integrated Disease Management in Sugarcane. In: Technologies for Sustainable Sugarcane Production (Eds. Pratap, D. Puthira, K. Mohanraj and G. Hemaprabha), ICAR-Sugarcane Breeding Institute (ICAR-SBI Training Series: 2023/E/2), (ISBN: 978-93-85267-39-0), pp. 134-147.
16. **Malathi.P.** 2024. Mechanized Priming of Planting Material for Productivity Increase in Vegetatively Propagated Crops – Sugarcane. In Climate Smart Sugarcane Agriculture for Food and Energy Security in India, (Eds. G. Hemaprabha and C. Appunu). Course Manual of ICAR sponsored winter school, January 31-February 20, 2024. ICAR-Sugarcane Breeding Institute, Coimbatore - 641 007, Tamil Nadu, India. ISBN 978-93-85267-42-0; Pp. 124-131.

Pamphlets

17. **Malathi, P.,** R. Viswanathan, Ravindra Naik, A. Ramesh Sundar, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2022. Sett Treatment Device: An effective way to deliver agro-inputs for planting materials of sugarcane. Extn. Publication No.301.p.4, SBI, Coimbatore.

18. **Malathi, P.,** R. Viswanathan, Ravindra Naik, A. Ramesh Sundar, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2022. Modern method of sett treatment in sugarcane (**Hand out in Tamil**). Extn. Publication No.310.p.2, SBI, Coimbatore.
19. **Malathi, P.,** R. Viswanathan, Ravindra Naik, A. Ramesh Sundar, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2022. Sugarcane Sett Treatment Device (**Leaflet in English**). Extn. Publication No.326.p.2, SBI, Coimbatore.
20. **Malathi, P.,** R. Viswanathan, Ravindra Naik, A. Ramesh Sundar, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2022. Sugarcane Sett Treatment Device (**Leaflet in Tamil**). Extn. Publication No.327.p.2, SBI, Coimbatore.
21. **Malathi, P.,** T. Rajula Shanthi, A. Vennila, T. Ramasubramanian, Ravindra Naik, and A. Ramesh Sundar. 2023. Role of Sett Treatment Device on the integrated management of pokkah boeng in sugarcane (**Tamil**). Extn. Publication No.333.p.4, SBI, Coimbatore.
22. **Malathi, P.,** T. Rajula Shanthi, A. Vennila, T. Ramasubramanian, Ravindra Naik, and A. Ramesh Sundar. 2023. Technology on mechanized sett treatment to protect sugarcane (**Tamil**). Extn. Publication No.335.p.4, SBI, Coimbatore.
23. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar, Ravindra Naik, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2023. Sugarcane Sett Treatment Device (**User Manual in English**). Extn. Publication No.338.p.6, SBI, Coimbatore.
24. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar, Ravindra Naik, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2023. Sugarcane Sett Treatment Device (**User Manual in Tamil**). Extn. Publication No.340.p.6, SBI, Coimbatore.
25. **Malathi P,** Viswanathan R, RavindraNaik, Ramesh Sundar A, RajulaShanthi T, Vennila A, and Ramasubramanian T (2023) Mechanized treatment of planting material using sugarcane sett treatment device. (**Hand-out in English**), ICAR-SBI Extension publication No. 341. pp.2.
26. **Malathi, P.,** T. Rajula Shanthi, A. Ramesh Sundar. R. Selvakumar, R. Gopi, A. Vennila, T. Ramasubramanian and Ravindra Naik. 2023. Healthy Nursery Programme for Sustainable Sugarcane Agriculture – Role of Mechanized Sett Treatment (**Tamil**). Extn. Publication No.345.p.6, SBI, Coimbatore.
27. **Malathi, P.,** T. Rajula Shanthi, A. Ramesh Sundar. R. Selvakumar, R. Gopi, A. Vennila, T. Ramasubramanian and Ravindra Naik. 2024. Healthy Nursery Programme for Sustainable Sugarcane Agriculture – Role of Mechanized Sett Treatment (**Tamil**). Extn. Publication No.345.p.6, SBI, Coimbatore.
28. **Malathi, P.,** T. Rajula Shanthi, A. Ramesh Sundar. R. Selvakumar, R. Gopi, A. Vennila, T. Ramasubramanian and Ravindra Naik. 2024. Management of pokkah boeng and mealy bug in sugarcane (**Tamil handout**), ICAR-SBI Extension publication No. 359. pp.2.
29. **Malathi, P.,** R. Gopi and M.L. Chhabra. 2024. Mechanized Priming Technology for Healthy Nursery Programme and Disease Management in Sugarcane. Extension Publication No. 370 (2024H). pp.4 (**Hindi**).

Conferences

30. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar and C. Naveen Prasanth. 2013. Rapid sett treatment for the management of sugarcane red rot caused by *Colletotrichum falcatum*. Proc. National Symposium on Pathogenomics for Diagnosis & Management of Plant Diseases, 24-25, Nov. 2013, CTCRI, Trivandrum, pp 122-123.
31. **Malathi P.,** R. Viswanathan, A. Ramesh Sundar and C. Naveen Prasanth. 2014. Rapid treatment of sugarcane planting material for the management of major fungal diseases – A new approach. Proceedings of the Symposium on Bioenergy for Sustainable Development- The Potential Role of Sugar Crops, 23-25, June, 2014, Coimbatore pp 184-186.
32. **Malathi P.,** R. Viswanathan and A. Ramesh Sundar. 2015. Management of sugarcane red rot by mechanized means of sett treatment. Proceedings of the 36th Annual Conference and National Symposium on “Challenges and Management Approaches for Crop Diseases of National Importance – Status and Prospects” February 12 – 14, 2015, Madurai, p303.
33. **Malathi, P.,** R. Viswanathan, Ravindra Naik; C. Naveen Prasanth and Jacob Annamalai. 2017. Sett Treatment Device – An effective way to deliver agro-inputs for planting materials of sugarcane, National symposium on sugarcane mechanization: Challenges and opportunities, March 17-18, 2017, Bannari Amman Institute of Technology, Satyamangalam, pp 15-16.
34. **Malathi. P.** 2020. **Innovation in Sugarcane sett treatment** for improved protection and production” in the “National Conference on Empowerment of Rural Communities through Innovations in Science and Technology” - during 21& 22, February, 2020 at Kongunadu Arts and Science College (KASC), organized by Indian Science Congress Association (ISCA) and KASC. **(Invited Lecture).**
35. **Malathi, P.,** Ravindra Naik; R. Viswanathan, A. Ramesh Sundar, T. Ramasubramanian and A. Vennila. 2021. Sett treatment device – feasible to deliver physical, chemical and biological agents to improve sugarcane production and protection. Proceedings of International Conference on Sugarcane Research: Sugarcane for Sugar and Beyond (CaneCon-2021), 19-22 June 2021, Coimbatore, India. Pp. 526-529.
36. **Malathi, P.,** R. Viswanathan, Ravindra Naik and A. Ramesh Sundar. 2021. ‘Sett Treatment Device – An effective way of delivering agro-inputs for improved protection and production in sugarcane.’ Proceedings of "79TH STAI ANNUAL CONVENTION AND INTERNATIONAL SUGAR EXPO 2021", October 4th and 5th, National Sugar Institute, Kanpur, India, Pp.83-94.
37. **Malathi P.,** R. Viswanathan, A. Ramesh Sundar, Ravindra Naik, T. Ramasubramanian and A. Vennila. 2021. ‘Vacuum based treatment– An innovative technology of treating planting materials with various agro-inputs for enhanced crop protection’. Proceedings of Golden Jubilee International Conference on “Global Perspectives in Crop Protection for Food Security” December 8th to 10th, CPPS, TNAU, Coimbatore, TamilNadu, India, Pp.
38. **Malathi, P.,** R. Viswanathan, Ravindra Naik and A. Ramesh Sunder. 2022. Mechanized priming of planting materials with physical, chemical and biocontrol agents for the management of biotic and abiotic stresses in sugarcane. ‘Proceedings of "80TH STAI ANNUAL CONVENTION AND INTERNATIONAL SUGAR EXPO 2022", July 28-29, 2022, at Dr. Shyama Prasad Mukherjee Indoor Stadium, Goa, India, Pp.03-12.
39. **Malathi, P.,** A. Ramesh Sundar, R. Selvakumar, V. Jayakumar, K. Nitya, A. Vennila, T. Ramasubramanian and T. Rajula Shanthi (All from ICAR-SBI); R. Viswanathan and Shweta Singh (IISR); Ravindra Naik (CIAE); S.S. Veena, M.L. Jeeva and T. Maheshkumar (CTCRI); V. Ravichandran (TNAU); Priti Sonavane and S. Sriram (IIHR); R. Thangavelu and M. Loganathan (NRCB). 2023. Mechanized priming of planting materials in sugarcane and other vegetatively propagated crops: An innovative approach for healthy nursery and disease management. Proceedings

of “National Symposium on Plant Health Management: Current Trends and Novel Mitigation Strategies” organized by Indian Phytopathological Society – SZ at CTCRI, Thiruvananthapuram during 11-12th September, 2023, Pp. 99-100.

40. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar and Ravindra Naik, T. Rajula Shanthi, A. Vennila and T. Ramasubramanian. 2023. Mechanized Priming of Sugarcane Planting Materials - An efficient and economical way of delivering agroinputs for Healthy Nursery and Main field crop. Proceedings of 52nd Annual Convention of SISSTA at Chennai during 29-30th Sept., 2023, Pp. 198-203.
41. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar, Ravindra Naik, R. Selvakumar, A. Vennila, T. Ramasubramanian, T. Rajula Shanthi and D. Puthira Pratap. 2023. “Management of pokkah boeng in Sugarcane and Role of Sett Treatment Device in managing sugarcane diseases” in 53rd Sugarcane Research and Development Workshop of Tamil Nadu and Puducherry at Theni during 3rd-4th November 2023, Pp.233-243.
42. **Malathi, P.,** R. Viswanathan, A. Ramesh Sundar, R. Selvakumar, V. Jayakumar, R. Gopi, K. Nitya, A. Vennila, T. Ramasubramanian, T. Rajula Shanthi and Ravindra Naik. 2024. Mechanized priming of planting material for sustainable sugarcane agriculture. Proceedibgs of 8th IAPSIT International sugar conference and Sugarcon, 2024 organized by the Society for Sugar Research and Promotion (SSRP) at ICISE, Quy Nhon, Binh Dinh, Vietnam during 16-19, September’2024.



भा.कृ.अनु.प.- गन्ना प्रजनन संस्थान
ICAR - SUGARCANE BREEDING INSTITUTE

भारतीय कृषि अनुसंधान परिषद
Indian Council of Agricultural Research

(Ministry of Agriculture and Farmers' Welfare, Govt. of India)

कोयम्बतूर - 641007 तमिलनाडु
COIMBATORE - 641007 TAMILNADU



CERTIFICATE

This is to certify that Dr. (Mrs.). P. Malathi, Principal Scientist (Plant Pathology) of ICAR-Sugarcane Breeding Institute, Coimbatore has 25 years of experience in Sugarcane Pathology and immensely contributed for identifying red rot resistant varieties, red rot management by conventional and molecular approaches. She developed the technology on mechanized treatment of planting materials with various agro-inputs using Sugarcane Sett Treatment Device, which has been patented, commercialized and being adopted by Sugar Mills and Entrepreneurs across the country for disease management and Healthy Nursery Programme. This technology is being effectively used for integrated disease management and varietal rejuvenation in different breeding programmes including National Hybridization Garden. Further the mechanized priming technology has been validated in AICRP for the management of sugarcane diseases and being effectively disseminated through NADP-RKVY and NFSM.

The Director, ICAR-Sugarcane Breeding Institute certify that the information /claim furnished by the applicant is correct to the best of my knowledge.

Place : Coimbatore
Date : 25.03.2025

Dr. P. Govindaraj
25/3/25

Signature

Name, Designation of the Certifying
Authority with Seal
(Controlling officer)

डॉ. पी. गोविन्दराज / Dr. P. GOVINDARAJ
निदेशक
Director
भा.कृ.अनु.प. - गन्ना प्रजनन संस्थान
ICAR - Sugarcane Breeding Institute
कोयम्बतूर - 7 / Coimbatore - 7

Telephone Nos. Director Office : 0422-2472986 Res : 0422-2472811
General : EPBX : 0422-2472621, 2472723, 2472772, 2472823, 2473971, 2473194, Fax : 0422-2472923
E-mail : director.sbi@icar.gov.in, Website : <https://sugarcane.icar.gov.in>