

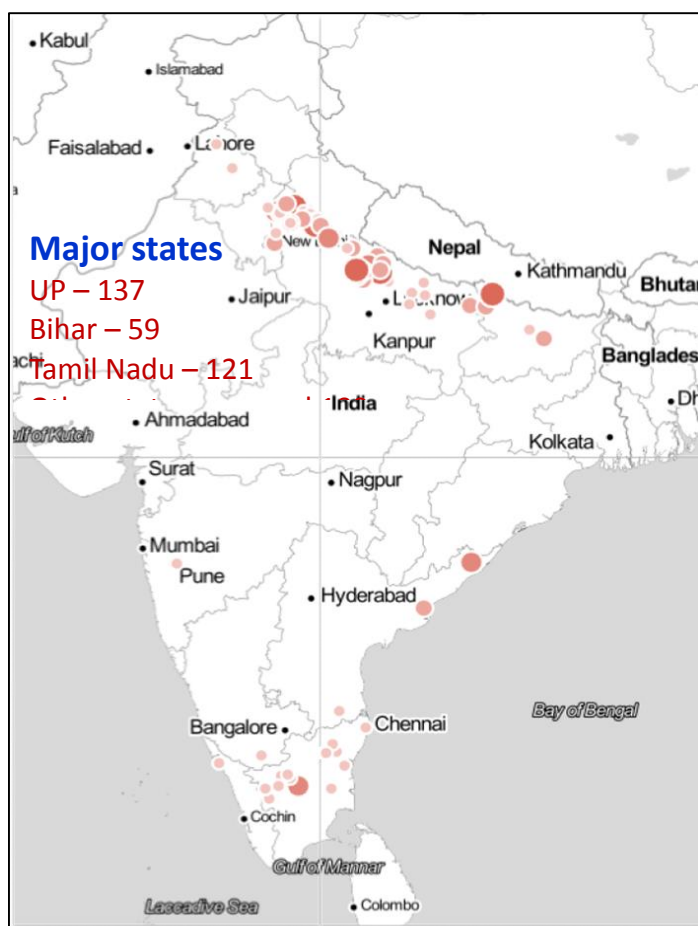
About the technology and its application

- **Patented, commercialized and innovative technology**



Application of this technology using ‘Sugarcane Sett Treatment Device (STD)’ was developed in association with ICAR-CIAE and commercialized in 2016. This technology aims for sustainable cultivation of elite varieties in sugarcane and other vegetatively propagated crops and increasing the productivity by avoiding loss due to diseases, early season pest and nutrient deficiency. Also empowering the farmers for increased crop yields, profitability and sustainable livelihood. Since commercialized in 2016, four private firms have procured the technology and effectively installed about 500 units all over India. The technology has been validated in 13 AICRP centers for Healthy Nursery programme and management of sugarcane diseases viz., red rot, smut, wilt and pokkah boeng across 4 zones and being adopted by sugar mills and farmers. Entrepreneurship is encouraged with 40-50% subsidy for the device under SMAM’ 2024 approved by the Ministry of Agriculture and Farmers Welfare and being effectively disseminated under NADP-RKVY and NFSM throughout India for sustainable sugarcane Agriculture.

Dissemination



Adopted by Sugar mills and Entrepreneurs for Healthy nursery programme and Disease management

Application

Mechanized priming favours dual treatment for IDM



Integrated management of diseases and early season pests

Physical – Hot water

Chemical –
Fungicides, Nutrients

Biological –
Fungal and Bacterial



Sett Treatment Device (STD)

STD – Hot Water Treatment (STD-

Application of the mechanized priming technology in other vegetatively propagated crops – Collaboration with 7 ICAR institutes

NEW VISTAS | OTHER CROPS (Inter-Institutional)



- By using this equipment, the sett treatment is done in 10-15 minutes with more effective diffusion of the chemicals or bio-inoculum into the sugarcane setts / buds. Chemical requirement is reduced by 1/10th in the mechanized treatment as compared to overnight soaking (300 g vs 3 kg).

Efficacy of sett treatment with fungicide for red rot management

OVERNIGHT SOAKING



Laborious, toxic to human & soil health



Infected control



Healthy control



Overnight soaking with TM 0.1%



Mechanized sett treatment with TM 0.1%

MECHANIZED TREATMENT



Simple, Rapid, Effective, Economical and Ecofriendly

Overnight soaking = Mechanized treatment

Fungicide	Cost	Time	Fungicide	Cost	Time
3900g	Rs.4875 /	18-24hrs	260g	326/-	3hrs

- Besides, for managing **red rot**, fungicidal treatments individually (thiophanate methyl) or in combination with another fungicide (azole-strobin) or biocontrol agents (bacterial antagonist) and biofertilizers in various fields resulted 50 to 100% more plant survival and yield as compared to control.



Treated



Control



- Likewise, with 100% **smut** infected planting material, yield has been improved by 75.9% with mechanized sett treatment alone and 91% with sett treatment and spray and it was 1.4 fold by



Treated



Control



- By treating single bud setts with suitable fungicide and insecticide along with nutrients, completely protect the crop from mealy bug and significantly reduces ESB incidence by > 50% along with reduction of red rot/ smut incidence in the field.

- Similarly, with **pokkah boeng** infected seed material, raising settlings or treating setts with nursery inputs, 100% yield improvement with <5% disease incidence was observed.



- In **seedling nurseries**, ~5000 single bud setts/ bud chips are treated at a time and by repeated treatment upto 1 lakh setts can be treated in a day. By treating single bud setts with combination of fungicide, insecticide and nutrients, production of first quality settlings was improved by 25 to 30% and further in the field, yield was improved by 9.9 to 19.1 % under different conditions.

Sett Treatment Device to treat single bud setts



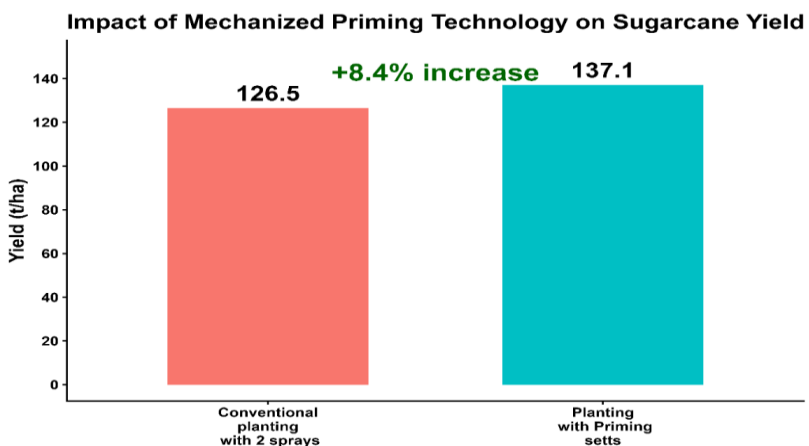
Based on results from field trials, simple cost benefit analysis has been worked out only based on the input used for red rot management. For an acre, 30,000 two budded setts require 3500 litres of water for complete soaking which needs bigger container and the chemical requirement is about 4600g which costs Rs 5670/-. The time requirement is atleast 18 to 24 hours. While in mechanized sett treatment device of 300 litres or two connective units of 150 litres capacity, 30,000 two budded setts require only 420g chemical in 300 litres of water costing Rs.490/- only. By repeating ten times, within five hours all the setts can be treated. Hence unnecessary dumping of chemical in the field could be avoided and it becomes an effective tool for application of Integrated Disease Management strategy.

Economic potential/ Impact

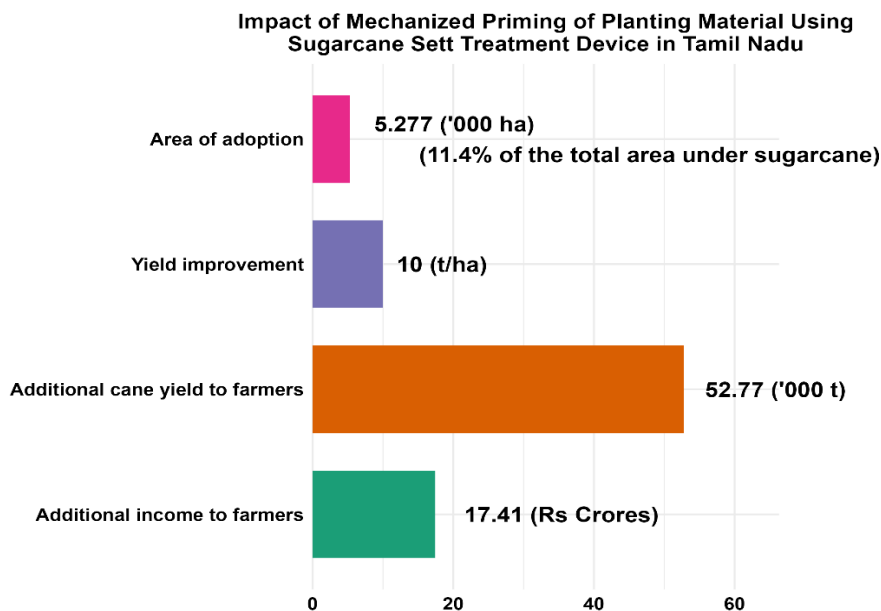
(i) Increased productivity/ farmers' income

In India, sugarcane is cultivated over approximately 5.6 million hectares, of which around 2.25 million hectares are planted annually using setts or seedlings. If STD is adopted across 90% of the planted cane area (around 2 million hectares), it has the potential to increase national sugarcane production by nearly 20 million tonnes annually. This translates to an average additional income of ₹25,000–30,000 per hectare for farmers, driven by yield gains of 8–10 tonnes per hectare. Hence, at the national level, widespread adoption of STD could generate an estimated additional return of ₹6,000 crores per year for sugarcane farmers in India, making it a highly impactful and scalable agricultural innovation.

(i). At Farm level



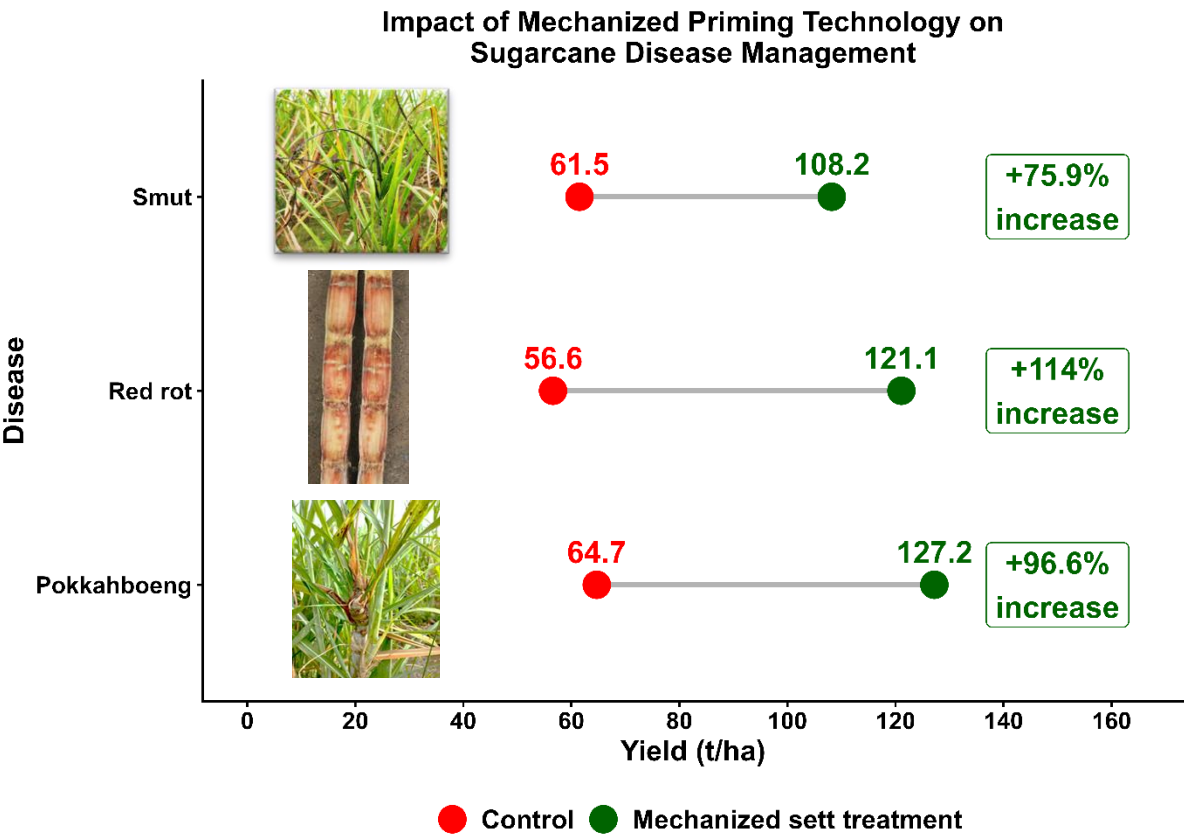
(ii). At large scale



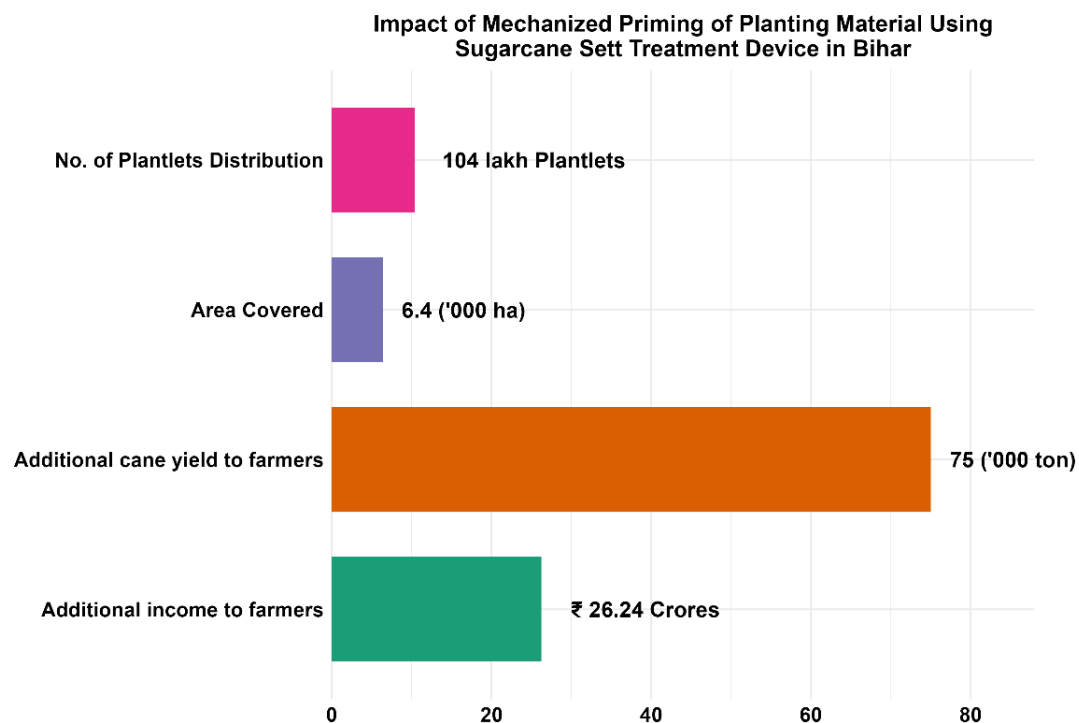
(ii) Sustainable cultivation of sugarcane elite varieties

Apart from normal situation, this technology plays major role to sustain elite varieties like Co 0238 in red rot endemic areas of Bihar by healthy settling production from fungicide primed single bud setts. It is evidenced by entrepreneurs and sugar mills, who have adopted his technology with 49 units, for large scale production of settlings, since 2016 in Bihar. Hence, it sustains sugarcane and sugar productivity in Bihar with more than 70% area under Co 0238 in all the four sugar mills. Similarly, in Tamil Nadu, private sugar mill units, who have adopted this technology for raising nurseries, since 2016 could escape from pokkah boeng menace during 2020-2023 and save the sugarcane area and productivity as compared to other private, public and co-operative mills, who have not adopted the technology and lost their area. Seeing the importance, Tamil Nadu Government had developed 60 entrepreneurs in co-operative mills in 2024 to develop healthy disease free nursery and protect crop health in the main field.

(i). At Farm level

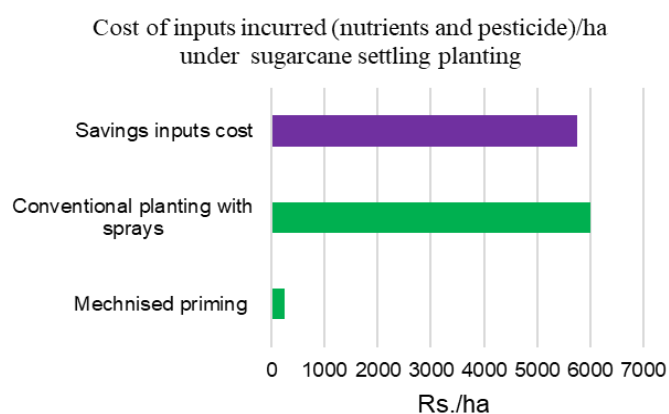


(ii). At large scale



Social Impact

(i) Reduced input cost: The mechanized process is faster and significantly reduces cost incurred for seed, labour and chemical inputs by 1/10th and completes the farm operations in time. Cost of agro-inputs (nutrients and pesticides as sprays) could be saved upto minimum of Rs.2500/ac and maximum of Rs. 4000/ac.



(ii). Promotes Organic/ Natural farming: By treating setts with bio-agents (like Trichoderma or Pseudomonas) and any organic formulations, it promotes organic practices, protecting the soil environment while managing pathogens, aligning with sustainable food security goals.



Liquid bioformulations for mechanized sett treatment

- (iii) **Entrepreneurship:** Earlier introduced SSI approach was failed due to problem faced by the farmers to produce healthy settlings. However, with the introduction of sett treatment device, entrepreneurs are successfully producing the healthy settlings, which intern establishes well in the main field.



Entrepreneurship for Youth – Men and Women

- (iv). **Empowerment of Marginal Farmers:**

Low-cost and shared community-based machines allow smaller farmers to access advanced technology. Besides, small and marginal farmers getting the facility from bigger farmers and doing the business by leasing.



Income for small and marginal farmers

- (v). **Employment for rural women:**

Increased efficiency in nursery development and planting operations often leads to improved working conditions and potential for employment in modernized



Employment for women

- (vi). **Food security and clean environment:** Reduction of diseases and improved yields will lead to enhanced sugarcane and sugar production helps to reach sustainable food security at affordable prices to domestic consumers. In addition, by products of sugarcane often providing eco-friendly consumer products such as bioethanol, bioplastics and bio-gradable products which helps to protect the environment

Technology recognition by ICAR and Ministry

Instagram

One ICAR Technology

Mechanized Priming in Sugarcane Sett Treatment Device enables Smart delivery of Agro inputs



- Developed against conventional overnight soaking for the management of fungal diseases.
- Rapid: 15 – 30 min.
- Economical, ecofriendly and practically feasible.
- Amenable for large scale application.
- Protects sugarcane setts from biotic and abiotic stress.
- Protects from fungal diseases viz., red rot, smut, wilt and pokkah boeng, early season pests and nutrient deficiency.

Integrated management of red rot in sugarcane

Mechanized sett treatment with fungicides offers a quick, cost-effective, and efficient method to eliminate sett-borne infections and protect setts from soil-borne red rot.

Ensures sustain elite varieties affected by red rot and prevents yield losses in both plant and ratoon crops.



Indian Council of Agricultural Research's post



Indian Council of Agricultural Research

26 September 2025

ICAR-SBI's Mechanized Priming Technology is revolutionizing sugarcane and other vegetatively propagated crops. Using the Sugarcane Sett Treatment Device (STD), this patented innovation integrates physical, chemical, and biological inputs for smart pest & disease management—validated across ICAR centres.

With 500+ installations in states like Tamil Nadu, Uttar Pradesh, and Bihar, the technology delivers healthy nurseries, controls red rot, smut, wilt & pokkah boeng, and boosts crop productivity.

Supported under SMAM with 40–50% subsidy, it's empowering farmers, sugar mills & rural entrepreneurs.

#ICAR Shivraj Singh Chouhan Ministry of Agriculture & Farmer's Welfare, Government of India
Press Information Bureau - PIB, Government of India

MECHANIZED PRIMING TECHNOLOGY

ICAR-SUGARCANE BREEDING INSTITUTE INNOVATION



The Device (STD)

Sugarcane Sett Treatment Device (STD) primes planting material by combining hot water dip, chemical & bio-agent delivery in one mechanized unit—ensuring quick, uniform, and effective treatment.

Why it matters ?

Healthy nurseries	Efficient delivery of inputs
Controls red rot, smut, wilt & pokkah boeng	Higher yields & productivity

Adoption

500+ units across India | Rapidly expanding in Tamil Nadu, UP & Bihar

Support

40–50% subsidy under Sub-Mission on Agricultural Mechanization | Boosts farmer & rural entrepreneurship

– USER MANUAL

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PUBLICATIONS (National/ International)

Mechanized Means of Sett Treatment: An Effective Way of Delivering Fungicides for the Management of Red Rot in Sugarcane

April 2016 · [Sugar Tech](#) 19(2)

DOI: [10.1007/s12355-016-0444-z](https://doi.org/10.1007/s12355-016-0444-z)

2017

 P. Malathi ·  Rasappa Viswanathan ·  Rameshsundar Amalraj

Efficient and Economical Way of Improving Sugarcane Settling Vigour by Mechanized Priming of Single Bud Setts with Nutrients

July 2023 · [Sugar Tech](#) 25(4)

DOI: [10.1007/s12355-023-01293-w](https://doi.org/10.1007/s12355-023-01293-w)

2023

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Indian Journal of Agricultural Sciences **95** (4): 395–399, April 2025/Article

<https://doi.org/10.56093/ijas.v95i4.157032>

2025

Enhancing chemical delivery efficiency through sett treatment device for management of red rot in sugarcane (*Saccharum officinarum*)

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Bihar 848 125, India*

Received: 24 September 2024; Accepted: 23 January 2025

Mechanized sett treatment: An innovative technology to deliver various agro-inputs for the management of sugarcane diseases including the grassy shoot

January 2025 · [Phytopathogenic Mollicutes](#) 15(1):145-146

DOI: [10.5958/2249-4677.2025.00075.0](https://doi.org/10.5958/2249-4677.2025.00075.0)

2025

 P. Malathi ·  Rasappa Viswanathan ·  Rameshsundar Amalraj