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1. MAJOR RESEARCH HIGHLIGHTS

Embryogenic Cell Suspension (ECS) Cultures of cv. Grand Nain and Red Banana through bioreactor

A total of 42,312 tissue-cultured plants of Red Banana, Kaveri Poovan, and NRCB-20 Ney Poovan were produced using a bioreactor system. New Embryogenic Cell Suspension (ECS) cultures of the cultivars Grand Nain and Red Banana were developed and utilized as a resource for large-scale tissue culture production of planting material through bioreactor technology. Systematic field visits were conducted to evaluate the growth performance and yield of banana plantations established using NRCB-supplied tissue-culture planting material produced via this technology. The fields were assessed for vegetative growth, uniformity, crop vigor, and yield attributes. Field evaluation results clearly demonstrated that banana crops established using NRCB-supplied bioreactor-derived planting material exhibited a 20–30% increase in yield in Ney Poovan and Red Banana varieties compared to conventionally used planting material. Farmers also reported improved bunch weight, better fruit uniformity, and higher market acceptance. Consequently, bananas harvested from NRCB planting material were sold at an average price of ₹54



Figure 1. A. Red Banana somatic embryos. B. Grand Naine somatic embryos.

C. Ney Poovan field. D. Yield of Poovan. E. Red Banana field planted using bioreactor derived tissue culture plants

per kg, whereas those produced using conventional planting material fetched only ₹46 per kg. In the Athur area of Salem district, farmers who adopted NRCB planting material realized significantly higher net profits, driven by both increased yield and better market prices. These findings confirm that bioreactor-based planting material offers a clear economic advantage to farmers, reinforcing its potential for large-scale adoption.

Kaveri Vaaman (Dwarf Mutant)

TBM 9 (Kaveri Vaaman) is a dwarf mutant banana developed from a 10 Gy irradiated population at Bhabha Atomic Research Centre, Mumbai. It is the first banana mutant in India to be officially notified by State Variety Release Committee and Central Variety Release Committee (Gazette No. 3895, September 2, 2025). The plant attains a height of 150–160 cm with short internodal spacing (10–12 cm) and produces medium-sized, cylindrical bunches weighing 18–25 kg, comprising 8–10 hands of compactly arranged fruits.

Its dwarf stature makes it highly suitable for wind-prone areas (30–50 km/h) by reducing the risk of lodging. It is also a promising option for terrace gardening, although it has a slightly longer crop duration and relatively lower yield compared to conventional varieties.

thereby reducing cultivation costs by 10–15%. The variety is easy to handle, well suited for pack house operations and export, and its medium bunch size facilitates harvesting and transportation. ICAR National Research Centre for Banana has distributed around 10,000 plants to farmers, and the variety has been licensed to private tissue culture companies such as HortBio and Jain Irrigation Systems Limited for large-scale propagation and wider availability.

Performance of dwarf mutant Kaveri Vaaman in Terrace garden



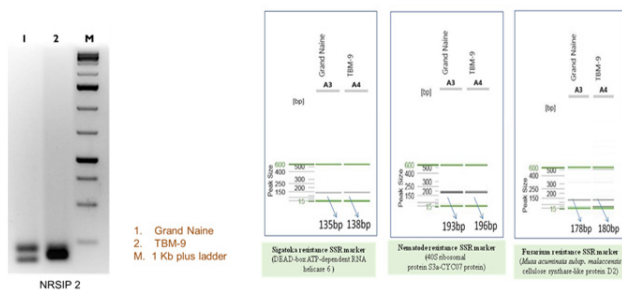
Development of biofilms incorporated with nano particles in improving postharvest life of strawberry

The present study investigated the effects of nano-zinc (ZnNPs) and nano-silver (AgNPs), applied individually and in combination, on the properties of nanocomposite bioplastic films developed at concentrations of 30, 60, and 90 ppm (SZ30, SZ60, SZ90, and SZSS30, SZSS60, SZSS90). Among all treatments, the combined formulation containing 90 ppm nano-zinc and 90 ppm nano-silver (SZSS90) exhibited the best overall performance, with the lowest moisture content, reduced water and alcohol solubility, and minimal water absorption, along with the highest tensile strength and strongest antifungal activity. The highest biodegradability was observed in films containing 30 ppm nano-zinc (SZ30), indicating a concentration-dependent effect on degradation. When used as active packaging for strawberry, SZSS90 films ensured maximum retention of ascorbic acid, acidity, firmness, phenols, and flavonoids, while minimizing increases in sugars, total soluble solids, and pH during storage. In contrast, control Low-density polyethylene packaging showed rapid quality deterioration. Overall, SZSS90 emerged as the most effective formulation, demonstrating strong potential as a sustainable active packaging material for extending the shelf life of strawberries.



Kaveri Vaaman (Dwarf Mutant)

DNA fingerprinting of Kaveri Vaaman (TBM 9) using SSR markers



The variety is recommended for cultivation in states such as Tamil Nadu, Karnataka, Kerala, Assam, West Bengal, Bihar, and Odisha. Compared to Grand Nain banana, its shorter plant height (1.5–1.6 m vs. 2.0–2.4 m) eliminates the need for propping or staking,

2. Transfer of Technology (ToT)

During the second quarter of 2025, Institute transferred a range of banana production and value-addition technologies to stakeholders across India. These included a new generation tissue culture

system (28 April–02 May 2025) to M/s. HBS Agro and Aqua Services Pvt. Ltd., Telangana, and a variety-specific direct regeneration protocol for mass multiplication (13–17 May 2025) to a stakeholder in Andhra Pradesh. The Kaveri Microbial Consortium (25 June 2025) was transferred to M/s. MIT College of Agriculture and Technology, Tamil Nadu, while cost-effective ripe banana powder and product technologies (02–04 April 2025) were licensed to an enterprise in Karnataka. Additionally, on 27 May 2025, a comprehensive package of post-harvest and value-addition technologies covering processing, nutraceutical products, beverages, and fibre extraction was transferred to M/s. Kudumbashree, Government of Kerala.



M/s. MIT College of Agriculture and Technology



M/s. HBS Agro And Aqua Services Pvt. Ltd

3. Outreach and Extension Capacity Development Programmes

Particulars	No. of Programme	No. of Beneficiaries
Training		
One day training for farmers	01	25
Off campus training	10	300
Exposure Visit		
Farmer's exposure visit	11	434
Student's exposure visit	12	552
Total	24	1311



On & Off Campus trainig programme

Transfer of technologies through print and electronic media

ICAR–NRCB disseminated important banana production and protection technologies to farmers and the general public through multiple communication channels. Information was shared via newspapers and magazines, and also broadcast through All India Radio and television to ensure wider outreach. In addition, social media platforms were effectively utilized to connect with a broader audience, while select success stories and technical content were released as e-publications. Altogether, a total of 29 outreach outputs were generated, including 13 news stories, 6 publications in print media, and 10 broadcasts through electronic media (TV and AIR). These concerted efforts facilitated the effective and accessible transfer of technologies to a larger farming community.

Transfer of technology through frontline exhibition activities

During the second quarter of 2025, the institute actively participated in major outreach and extension events. A team of scientists engaged in the Food Processing & Technology Expo organized by MADISSIA at Velammal Medical College, Madurai, from 2–4 May, reaching around 5,000 beneficiaries. Similarly, participation in the Mega Agricultural Exhibition organized by the Department of Agriculture, Government of Tamil Nadu, at Perundurai on 11–12 June also benefited approximately 5,000 stakeholders.



OTHER INFORMATIONS

Workshop on “Agrinnovate India Initiatives on Technology Transfer, Commercialization and IP Management” held on 02nd May 2025

To promote commercialization and intellectual property (IP) management, a one-day workshop was organized at the ICAR–National Research Centre for Banana on 2 May 2025. About 350 stakeholders from various banana-related enterprises participated in the programme.



ICAR-NRCB participated in MADITSSIA Food Tech 2025, Food processing and Technology expo held during 2nd - 4th May 2025 at Trade Centre, Madurai.

The ICAR–National Research Centre for Banana participated in MADITSSIA Food Tech 2025, a food processing and technology expo held during 2–4 May 2025. R. Selvarajan, Director of the ICAR–National Research Centre for Banana, inaugurated the programme, and scientists from the institute participated in the technical sessions.





ICAR - NRCB & Isha Outreach, Coimbatore

Three Farmer Producer Organizations (FPOs), namely Karamadai FPO, Sakthi Bhairavi FPO, and Bavani Amman FPO (Isha Outreach, Coimbatore), participated in a one-day training programme conducted at ICAR-NRCB during 20–22 May 2025.



Viksit Krishi Sankalp Abiyan (VKSA)

Under the Viksit Krishi Sankalp Abiyan (VKSA) programme launched by the Government of India from 29th May to 12th June, 2025 a series of awareness campaigns were conducted by ICAR-NRCB staff across various districts of Tamil Nadu. In total, 364 Gram Panchayats were covered, reaching out to 50,203 beneficiaries.



Viksit Krishi Sankalp Abiyan (VKSA)

Pre-Kharif Campaign: 01 June 2025
ICAR - National Research centre for Banana, Tiruchirappalli, Tamil Nadu



Participation in Workshop/ Training/ Seminar/ Conference/ Meetings

Staff Name	Name of the event	Venue	Date
R. Selvarajan	XXVI Scientific Advisory Committee Meeting	CENDECT KVK, Theni	25 March
	WSV2025: The Third International Conference of the World Society for Virology “THE VIROSPHERE OF OUR CELLULAR WORLD”	Kuala Lumpur, Malaysia	6 – 8 May
	ICAR Institute’s Directors conference	NASC, New Delhi	20 May
	State Level Technical Programme meeting of Plant Pathologists	RARS, ANGRAU, Kuntur	26 – 28 May
	Thirty Third Annual General Body Meeting (AGM) and Foundation Day Programme of the NAAS Academy	New Delhi	4 – 5 June

K.J. Jeyabaskaran	Scientific Writing Workshop for PG students and Research Scholars.	AD AC & RI (TNAU), Tiruchirappalli.	15– 17 May
R. Saranya	Training on “Plant Quarantine Procedures for Import and Export”	National Institute of Plant Health Management, Hyderabad	5 – 12 May
K.N. Shiva	Integrated Farm Assurance (IFA) v6 (Global GAP)	Hotel Hindustan International, Pune (M.S.)	14 – 18 April
M.S. Saraswathi	Farmers’ Scientists Interaction and made a presentation on Tissue culture banana cultivation and its management	M/s. Sathya BioTech in collaboration with MYRADA ICAR-KVK Erode and ICAR-NRCB, Trichy	14 May
	CVRC meeting	Central Seed Sub-committee	4 April
P. Suresh Kumar	35 FSSAI SP meeting of Fruits, vegetables and their products (including dried fruits and nuts)	FDA Bhavan, New Delhi	16 May
	Scientific writing workshop	HC&RI Periyakulam	28 May
	36 FSSAI SP meeting of Fruits, vegetables and their products (including dried fruits and nuts)	FDA Bhavan, New Delhi	4 July

Education (Students, Guest lectures/ speakers) etc.

During this quarter of 2025, a fifteen-day internship training programme titled “Biological Techniques in Banana” was conducted from 13 to 30 May 2025. The programme was led by Dr. I. Ravi as Course Director, with A. Mohanasundaram and G. Prabhu serving as Course Co-Directors, and M. Mayil Vaganan as the Organizing Secretary.

PUBLICATIONS

Research papers

Anuradha, C., & Giribabu, P. 2025. A simple, rapid and cost-effective protocol for species identification of plant parasitic nematodes by PCR-based downstream application. *Indian Journal of Plant Protection*, 53(2), 77–80.

Hoque, M., Das, R. S., Paramasivam, S. K., Bhavya, M. L., Alimi, B. A., Tiwari, B. K., Kerry, J. P., & Pathania, S. 2025. Banana sheath cellulose extraction and incorporation into pectin/carrageenan film employing linalool: Fabrication and comprehensive characterisation of physical and antimicrobial properties as potential food

packaging applications. *International Journal of Biological Macromolecules*, 314, 144302.

<https://doi.org/10.1016/j.ijbiomac.2025.144302>

Naik, R., Patil, H., & Paramasivam, S. K. (2025). A sustainable alternative to single-use plastics: Development of biodegradable materials from banana plant waste. *Biomass Conversion and Biorefinery*, 15(22), 29161-29174.

Pandey, A., Arputharaj, A., Vigneswaran, N., Raja, A. S. M., Kumar, T. S., Patil, S., Paramasivam, S. K., Raja, D., & Pandiselvam, R. 2025. Advancement in biodegradable foam for packaging, filtration, thermal insulation, and medical application: a review. *Waste and Biomass Valorization*, 17(2), 621-641.

Rammohan, Y., Shuprajhaa, T., Paramasivam, S. K., Vasudevan, V., Sivaprasad, M., Prasad, T., Krishna, V. S., & Sireesha, Y. 2025. Impact of maturity stages and modification processes on resistant starch and starch properties of green banana flour and its glycaemic response. *International Journal of Biological Macromolecules*, 311, 143881.

Book Chapters

Sankari Meena, K., Deepa, S. P., Manju, P., Jena, R., & Giribabu, P. 2025. Belonolaimus. In N. Amaresan & K. Kumar (Eds.), *Compendium of phytopathogenic microbes in agro-ecology* (Vol. 3: Bacteria, protozoa, algae and nematodes, pp. 339–352). Springer Nature.

Uma, S., & Suresh Kumar, P. 2025. Horticulture sector 2047. In H. Pathak, P. K. Joshi, W. S. Lakra, A. K. Singh, V. K. Baranwal, & R. K. Jain (Eds.), *Indian agriculture by 2047: A roadmap for research, education and extension* (pp. xxiv–371). National Academy of Agricultural Sciences.

Saranya, R., Amrutha, L. M., & Mawar, R. 2025. Microbe-based pesticides. In M. Santana de Oliveira, L. M. L. Nollet, R. Kumar, E. H. de Aguiar Andrade, & A. P. da Silva Souza Filho (Eds.), *Natural pesticides and allelochemicals: Advances and trends in crop protection* (1st ed., Chapter 11). CRC Press. <https://doi.org/10.1201/9781003463429>

Kumari, N., Kardam, V. K., Saranya, R., & Mawar, R. 2025. Biocontrol agents: A path towards curbing air-borne diseases of field crops. In U. B. Singh, R. Kumar, G. P. Singh, & H. B. Singh (Eds.), *Detection, diagnosis and management of air-borne diseases in agricultural crops*. Springer. https://doi.org/10.1007/978-981-96-7063-5_9

Accolades/Awards

Dr. R. Selvarajan, Director, received the prestigious award “Fellow of National Academy of Agricultural Sciences (NAAS)” during the Annual General Meeting on 4th June, 2025 held at NASC, New Delhi



P. Giribabu received Runner in Chess event at ICAR-South Zone Sports Tournament – 2024 held at Coimbatore during 8-11 April, 2025.



Personalia

Transfer/ Deputation

During the second quarter of 2025, Dr. R. Thangavelu, Principal Scientist, assumed charge as Director of ICAR–National Institute for Integrated Pest Management, New Delhi, with effect from 03 April 2025.



Extension & Farmers Services Corner

தேசிய வாழை அந்ராய்ச்சி மையத்தின்
காவேரி நுண்ணுயிர் கலவை
Kaveri Microbial Consortium (KMC)



இந்த KMC கிலோ ரூ. 150 க்கு விற்கப்படுகிறது.

தேசிய வாழை அந்ராய்ச்சி மையத்தின்
பனானா சக்தி
ஐந்து நுண்ணுயிர் சத்துக்களின் கலவை
Banana Shakti (Solid and Liquid)



இந்த Banana Shakti 1 கிலோ ரூ. 250 க்கு விற்கப்படுகிறது.

இந்த Banana Shakti 1 லிட்டர் ரூ. 150 க்கு விற்கப்படுகிறது.

தேசிய வாழை அந்ராய்ச்சி மையத்தின்
வாழை கூன் வண்டு கொல்லி
(NRCB-Banana Weevil Killer)
(சியூவேரியா பாசிபானா / *Beauveria bassiana*)








இந்த வாழை கூன் வண்டு கொல்லி 1 லிட்டர் ரூ. 500 க்கு விற்கப்படுகிறது.

Contact Us

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For Location

