

Banana Bites

Volume 28 (4)

October - December 2024



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From the Director: I am very happy to share the present newsletter for the quarter October – December 2024 to our esteemed readers. This edition highlights the achievements of ICAR-NRCB across research, outreach, and capacity-building efforts.



This quarter marked significant progress in banana improvement. Albino plants were developed in the cultivar Grand Nain by targeting the *phytoene desaturase* (PDS) gene using CRISPR-Cas9, offering a functional validation of gene editing technology. An embryogenic cell line was successfully established in the banana variety Cultivar Rose, providing a foundation for future genetic transformation studies.

In post-harvest research, banana scutcher-a by-product of fibre extraction-was evaluated as a sustainable soil amendment. It demonstrated superior moisture retention and nutrient enrichment compared to coir pith, highlighting its potential to enhance soil health naturally.

In the domain of banana protection, trials conducted at Dr. Rajendra Prasad Central Agricultural University, PUSA, showcased eco-friendly approaches to managing pseudostem weevil and banana scarring beetle. Interestingly, the Kaveri Microbial Consortia (KMC), when used as a biopriming agent during tissue culture hardening, significantly enhanced root growth, nutrient uptake, and field establishment in banana plants.

During this period, ICAR-NRCB conducted 53 capacity development programmes benefitting 1,983 participants and participated in five major exhibitions. Our outreach efforts across social media continued to expand, ensuring greater visibility and awareness of our initiatives.

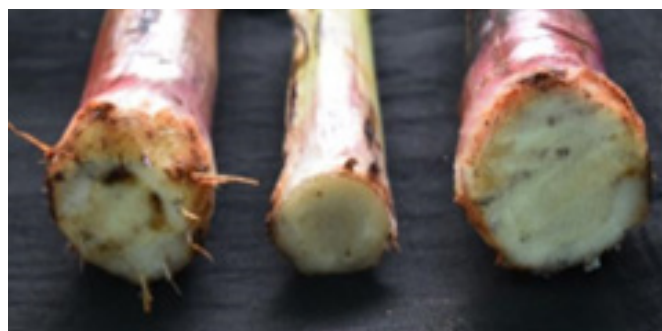
These achievements reflect the dedication and collaborative spirit of our scientific, technical, and administrative teams. I thank all staff for their valuable contributions and the editorial committee for their efforts in compiling this newsletter.



(R. Selvarajan)
Director

1. MAJOR RESEARCH HIGHLIGHTS

- Albino banana plants were developed in the cultivar Grand Nain by targeting the phytoene desaturase (PDS) gene using the CRISPR-Cas9/PDS sgRNA1 construct. This genetic modification disrupted carotenoid biosynthesis, resulting in the albino phenotype.
- An embryogenic cell line was successfully developed in the banana variety Cultivar Rose, establishing a foundation for genetic transformation and tissue culture studies.
- Pot screening of the mutated population of Grand Nain against *Fusarium oxysporum* f. sp. *cubense* (Foc) races 1 and TR4 identified 13 resistant mutant lines (11 for race 1 and 2 for TR4). These lines have been initiated under *in-vitro* conditions and will undergo further evaluation in sick plots and hotspot areas.



Foc TR4 resistant Lines



Foc race 1 resistant Lines

Details of mutagens and resistance in mutant Grand Nain

S. No	Mutagens	Resistant	No. of plants
1	40 Gy	TR4	1
2	0.2% EMS + 20 Gy	TR4	1
3	20 Gy	Foc Race 1	2
3	40 Gy	Foc Race 1	3
4	45 Gy	Foc Race 1	2
5	0.2% EMS	Foc Race 1	1
6	0.2% EMS + 20 Gy	Foc Race 1	3
Total			13

Focus on banana production

Scutcher as a sustainable soil health enhancer: Post-harvest research explores the potential of banana scutcher as an eco-friendly soil amendment. The study revealed that scutcher holds three hundred times more water than coir pith ($p < 0.01$), significantly enhancing soil moisture retention. After 60 days of incubation, soil with scutcher retained moisture more effectively than soil with coir pith alone. Furthermore, the study observed that scutcher contains higher levels of nitrogen (70%), phosphorus (77%), and potassium (52%). calcium (62%), and magnesium (84%) than coir pith, with lower sodium content (59% less).



Scutcher, a byproduct of banana fibre extraction process

Focus on banana protection

An experiment was conducted at Dr. Rajendra Prasad Central Agricultural University, Pusa, on the eco-friendly management of pseudostem weevil (*Odoiporus longicollis* Olivier) and banana scarring beetle (*Basilepta* spp.). All India Coordinated Research Project (Fruits) trials at Pusa were monitored.





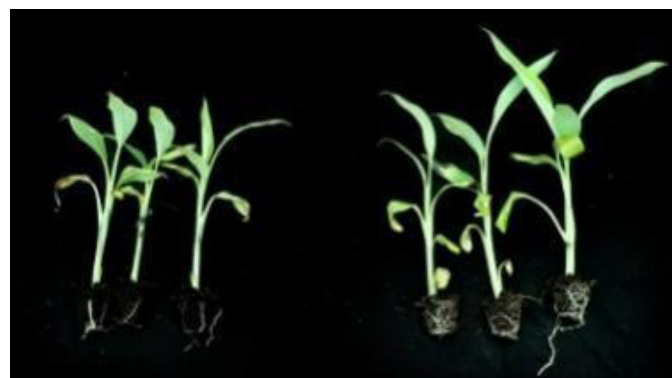
Glimpses of Monitoring of Banana Experiments under ICAR-AICRP on Fruits Project at RPCAU, Pusa. AICRP (F) banana team at RPCAU, PUSA centre & Field Germplasm at RPCAU, PUSA centre.

Management of Mealybug infestation in Tamil Nadu: To address the mealybug infestation in the Cauvery delta districts, particularly in Trichy and Karur, various initiatives such as demonstrations, field visits, extension strategies, and awareness programmes were undertaken. Drs. J. Poorani, A. Mohanasundaram, and C. Karpagam coordinated these events.



Mealybug affected banana at Kandiyur, Nadu Vathiyam Panchayat (Kulithalai, Karur District)

Kaveri Microbial Consortia (KMC) as bio-priming agent for tissue culture plants: Biopriming of bioreactor-derived tissue culture (TC) banana plants with Kaveri Microbial Consortia (KMC), consisting of *Bacillus aryabhatai*, *Priestia megaterium*, *B. pumilus*, *B. altitudinis*, *B. subtilis*, and *B. flexus*, during the primary and secondary hardening stages, significantly promotes plant growth. This microbial consortium enhances root development, nutrient uptake, and overall vigor, supporting better field establishment.



Control

Treated



Control

Treated

2. TRANSFER OF TECHNOLOGY (ToT)



Transferred technologies on banana value added products to Mr. Supratim Roy Choudhury, M/s. Pratyaksha Agrotech Private Limited, Bagbahar, Cachar, Assam, November, 2024



Transferred technology on central core stem Juice to Mr. P. Varun, Ambattur, Chennai, November, 2024



Transferred technology on banana flour-based product to Mr. V. Rajesh, Allur, Tiruchirappalli, December 2024



Signed MoU with SRM Institute of Science and Technology, Tiruchirappalli for Research collaboration and student exchange

MoU signed for Students exchange and collaborative research



Signed MoU with Dhanalakshmi Srinivasan University, Tiruchirappalli for Research collaboration and student exchange



Signed MoU for Establishing CIC on Banana Waste Processing and Value Addition at Burhanpur, Madhya Pradesh with Satpura Nature Fresh Producer Company Limited, ICAR-ATARI, Jabalpur, Department of Horticulture, Madhya Pradesh and NAU, Gujarat.

3. EXTENSION AND OUTREACH

Capacity Development Programme (CDP)

S. No.	Particulars	No. of programme/ groups	No. of beneficiaries
1.	On-campus one-day CDP for farmers	30	526
2.	On-campus one-day CDP for students	19	1375
3.	On-campus one-day CDP for entrepreneurs	4	82
	Total	53	1983





Glimpses of different CDP

Transfer of technology through frontline exhibition activities

S. No.	Event	Organizer & Venue	Date	No. of beneficiaries	Name of the participants staff
1.	CCI-Delta Agri & Food Expo	CCI, Thanjavur	04-06 October, 2024	10,000	R. Selvarajan C. Karpagam P. Ravichamy K. Kamaraju R. Pitchaimuthu M. Bathrinath S. Harishwar R. Gobi
2.	Gramodyog Vikas Yojana	KVIC & NRCB Trichy	10 October, 2024	130 (Women)	C. Karpagam P. Suresh Kumar K.N. Shiva P. Ravichamy K. Kamaraju S. Harishwar
3.	2nd ICAR-IIHR -Industry Meet	ICAR-IIHR, Bangalore	24 October, 2024	300	P. Suresh Kumar C. Sivananth
4.	Banana Festival & Save Soil Movement	ISHA, Tirunelveli	24 November, 2024	2,500	R. Selvarajan C. Karpagam K.J. Jeyabaskaran P. Suresh Kumar P. Durai R. Pitchaimuthu S. Harishwar S. Ajithkumar K. Manojkumar
5.	Banana Festival & Kisan Diwas	ICAR- NRCB, Trichy	23 December, 2024	600	Staffs of ICAR- NRCB



Glimpses of different Exhibitions

Transfer of technologies through print and electronic media

S. No.	Particulars	Nos.
1.	No. of news/ stories published	6
2.	No. of press meet	10
3.	No. of news published in print media	20
4.	No. of news published in electronic media (AIR & TV)	7
5.	No. of news published in social media	4
6.	No. of News stories reported in ICAR – NEWS (Online)	2



OTHER SIGNIFICANT OUTREACH PROGRAMMES

Banana Festival and Kisan Diwas: As part of Swachhta Pakhwada 2024 and to honour the farmers while commemorating the birth anniversary of Shri Choudhary Charan Singh, ICAR-NRCB organized a Banana Festival and Kisan Diwas on December 23, 2024. The event was inaugurated by Dr. Sanjay Kumar Singh, Deputy Director General (Horticultural Science), ICAR, New Delhi. Two new facilities — the Common Incubation Centre and the Trainees' Hostel — were also inaugurated on this occasion. The event witnessed the participation of over 600 farmers, stakeholders, and dignitaries.



Training on advanced Banana tissue culture: A ten-day training programme on “Cutting-Edge Techniques in Banana Tissue Culture and its Applications” was conducted at ICAR-NRCB, Tiruchirappalli, from December 11-20, 2024. During the programme, Dr. R. Selvarajan highlighted the role of bioreactor technology in banana tissue culture and acknowledged ICAR-NRCB's significant contributions to this field over the past 15 years. The programme was coordinated by Dr. S. Backiyarani and Dr. R. Selvarajan, who served as Course Directors, while Dr. M.S. Saraswathi, Dr. C. Anuradha and Dr. K. Nagendran served as Course Co-ordinators.



Awareness program on Banana fiber Entrepreneurship: ICAR-NRCB and KVIC jointly organized an awareness programme on “Transforming Waste to Wealth: Unlocking the Value of Banana Fibre” on October 23, 2024. Dr. R. Selvarajan, Director, ICAR-NRCB, emphasized the importance of such initiatives in fostering rural entrepreneurship, particularly among women. The programme was attended by more than 100 women stakeholders.



ICAR-NRCB Participated in CCI-Delta Agri & Food Expo 2024: ICAR-NRCB actively participated in the CCI-Delta Agri & Food Expo 2024, held from October 4- 6, 2024, at Thilagar Thidal, Thanjavur. The event was organized by the Chamber of Commerce & Industry, Thanjavur, and provided a platform for showcasing innovations



4. OTHER INFORMATIONS

Swachhta Hi Seva and Swachhta Bharat Diwas 2024: As part of Swachhta Hi Seva 2024, ICAR-NRCB, organized awareness sessions for employees on September 27-28, 2024, focusing on social welfare linkages and benefits. Safety kits were distributed to sanitation workers. On October 2, 2024, Swachh Bharat Diwas was celebrated. The Director of ICAR-NRCB emphasized the importance of maintaining proper laboratory hygiene and cleanliness. The event concluded with a demonstration showcasing the transformation of Clean Technology Units (CTUs), reinforcing the institute's commitment to a cleaner and greener environment.



Training session on waste recycle management





Celebration of Swachh Bharat Diwas and Prize Distribution



Five days Student Internship Training Program held at ICAR-NRCB during 11 to 15 November, 2024



Distribution of Welfare Benefits



Welfare scheme for Govt. Primary School, Keerikalmedu

Internship orientation on Biochemistry and Biotechnology: A five-day internship programme was organized for M.Sc. Biochemistry students from Holy Cross College, Tiruchirappalli, on “Techniques in Biochemistry and Biotechnology” during November 11-15, 2024. The programme was coordinated by Dr. A. Mohanasundaram and Dr. M. Mayil Vaganan, who served as Course Directors.

Swachhata Pakhwada 2024: Swachhata Pakhwada was organized from December 16-31, 2024. The event commenced with the Swachhata Pledge followed by awareness sessions on waste management and vermicomposting practices. On December 20, activities such as digitization of records, scrap disposal, and cleanliness drives were conducted. This was followed by a Miyawaki Plantation initiative to enhance greenery on the campus. Highlights of the Programme: Banana Festival, Drawing and Painting Competitions, Signature Campaign, Kitchen Garden Promotion, Swachhata Rally & Human Chain Formation. All the events were successfully coordinated by the Swachh Bharat Mission team, led by Dr. A. Mohanasundaram.





PARTICIPATION IN WORKSHOP / TRAINING / SEMINAR / CONFERENCE / MEETINGS

Staff Name	Name of the event	Venue	Date
R. Selvarajan	Chief Guest, CCI- Delta Agri & Food Expo	Thanjavur	4-6 October, 2024.
	Co-Chairman, Session on “Success stories of ABI/BESST HORT Incubates” in Second ICAR – IIHR Industry Meet.	ICAR-IIHR, Bengaluru	24 October, 2024.
	Chairman, Technical Session on Advanced Diagnostic, Biosurveillance and biosecurity in VIROCON 2024: International Conference- on “Emerging Viruses: Pandemic & Biosecurity Perspectives” organized by IVS New Delhi	DRDE, Gwalior	11-13 November, 2024
	Chairman, AO Selection Committee	N I F T E M , Thanjavur	21 November, 2024.
	Chief guest, Banana festival (Save Soil Movement – ISHA)	Tirunelveli	24 November, 2024
	Second advisory committee review meeting for the project titled, “Development of smart foods, bio-composites and Green packaging and bio- energy from Agro- residues”	ICAR– CTCRI, Thiruvananthapuram	09 December, 2024.
	Guest of Honor, State Level Workshop on Technological Advancements in Banana Production organized by Shri Shivaji Education Society, Amravati (M.S.), in collaboration with M/S.JISL, Jalgaon,	Shri Shivaji Agriculture College, Amravati, Maharashtra.	25 December, 2024.

S. Backiyarani	Sixth IBSC meeting	Sastra University	13 December, 2024
C. Karpagam	CCI-Delta Agri & Food Expo organized by the CCI	Thanjavur	4-6 October, 2024.
	Banana festival (Save Soil Movement – ISHA)	Tirunelveli	24 November, 2024.
A. Mohanasundaram	Workshop cum training on “Biomolecular characterization: GC-MS Technique”	ADAC & RI, TNAU, Trichy	11 December, 2024
K. Nagendran	Participated and presented research paper in VIROCON 2024: International Conference- on “Emerging Viruses: Pandemic & Biosecurity Perspectives” organized by IVS New Delhi	DRDE, Gwalior	11-13 November, 2024
	Five days training programme on “Application of CRISPR-Cas mediated genome editing for vaccines and diagnostics”	ICAR-IVRI Bengaluru	02-06 December, 2024
R. Saranya	Training programme on “Impactful ICT Applications and Technologies in Agriculture (online)” organized by ICAR- NAARM, Hyderabad	Virtual mode	04-08 November, 2024
	One-day workshop cum training on “Biomolecular Characterization: GCMS Techniques”	ADAC & RI, TNAU, Trichy	11 December, 2024
	Training programme on “Cutting-Edge Techniques in Banana Tissue Culture”	ICAR-NRCB	11-20, December, 2024.
Pramod Shelake	Training program on “Value Chain Management in Natural Fibers”	ICAR- NINFET, Kolkata	25-29 November, 2024.
	State Level Workshop on Technological Advancements in Banana Production organized Shri Shivaji Education Society, Amravati (M.S.), in collaboration with M/S.JISL, Jalgaon.	Shri Shivaji Agriculture College, Amravati, Maharashtra.	25 December, 2024.

Education (Students, Guest lectures/ speakers) etc.

Staff Name	Events
R. Selvarajan	- Keynote lecture on Recent advances and challenges in plant viral diagnostics in horticultural crops in VIROCON 2024: International Conference- on “Emerging Viruses: Pandemic & Biosecurity Perspectives” organized by IVS New Delhi held at DRDE Gwalior during 11-13th November, 2024. - Keynote lecture on Current advances in plant pathogen detection in horticultural crops” in National Conference on “Recent Advances in Plant Pathology and Innovative Approaches in Plant Disease Management (RAPPID) organized by IPS-CZ held at PJTSAU Rajendranagar, Hyderabad on 12 December, 2024 - Nominated as External examiner for Ph.D. public viva- voce examination, Department of Biotechnology, SRM University.
S. Backiyarani	- Lecture in the training program on “Cutting -Edge Techniques in banana tissue culture and its applications” - Lecture on recent advances of Biotechnology in Banana for the Students from Dr. N.G.P. Arts and Science College, Coimbatore and Kumaraguru Institute of Agriculture, Coimbatore - Internship training to Ms. Tresha Sugumar and Ms. Shriya from SASTRA Deemed University, Thanjavur and CUSAT, Kochi, Kerala.
M.S. Saraswathi	- Guest lecture on Banana Systematics to the M. Sc students of ICAR-IIHR, Bengaluru - Served as external examiner for evaluation of M.Sc thesis from Dr. YSRHU, Andhra Pradesh and HC&RI, TNAU, Periyakulam.
M. Loganathan	Guest lecture on “Power of microbes: Role and IPR” at AC&RI, TNAU, Madurai
C. Karpagam	Served as external examiner for evaluation of M.Sc theses from Department of Agricultural Extension Education, AC&RI, TNAU, Coimbatore
P. Giribabu	- Radio talk on ‘Nematodes and Insect Pest Management in Banana Cultivation’ - Lead Lecture on ‘Host Plant Resistance in Nematode Management – Present Status and Future Perspectives’ in International Conference on “Unleashing the Power of Seed and Crop Health Innovations for a Food Secure World” (ICUCF’24), held at TNAU, Coimbatore during 21-22 November, 2024.
A. Mohanasundaram	- Radio talk on “Sucking pest problem in banana and its management” & “Mealybug problem in banana and its management” - Served as external examiner for evaluation of M.Sc thesis from Department of Entomology, AC&RI, TNAU, Madurai & Coimbatore
All Scientific Staffs, ICAR-NRCB	Delivered lectures to students and farmers during On-campus capacity development programme

Research papers

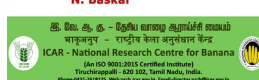
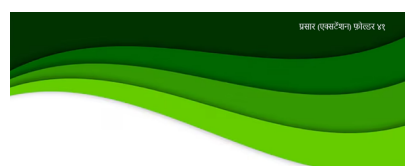
- Thangavelu R, Amaresh H, Gopi M, Loganathan M, Nithya B, Ganga Devi P, Anuradha, C, Thirugnanavel A, Patil KB, Blomme G, Selvarajan, R (2024). Geographical distribution, host range and genetic diversity of *Fusarium oxysporum* f. sp. *cubense* causing Fusarium wilt of banana in India, *Journal of Fungi* **10** (12): 887. DOI: <https://doi.org/10.3390/jof10120887>.
- Pandey S, Sagar V, Nagendran K, Devi J, Yadav PS and Kujur SN (2024). Trends and developments in vegetable research in India-a review, *Current Horticulture* **12**(3):3-23.V
- Vignesh, S., Nagendran, K., Senthil, N., Rohini, R., Mohana Pradeep, R.K. and Karthikeyan, G. (2024). Emerging squash leaf curl Philippines virus on pumpkin in India: their lineage and recombination, *Physiology and Molecular Biology of Plants*, 31, pp.119–129.
- Venkatesan M, Giribabu P, Mohanasundaram A and Manivel, P. (2024). Biocontrol potential of Entomopathogenic nematode (*Heterorhabditis indica*) against the grubs of Hadda beetle *Henosepilachna vigintioctopunctata* (Coleoptera: Coccinellidae) on Ashwagandha (*Withania somnifera*) under laboratory condition. *New Zealand Journal of Crop and Horticultural Science*, 1–11.

Technical Bulletin

- Suresh Kumar P, Shiva KN, Pramod Shelake, Sivananth C, Kamaraju K and Selvarajan R. 2024. Revitalizing the banana industry with innovative processes / products and engineering interventions, ICAR – National Research Centre for Banana, Tiruchirappalli, Tamil Nadu. pp.33. Technical Bulletin 40.
- Selvarajan R, Karpagam C, Backiyarani S, Saraswathi M S 2024. Unveiling India's GI Bananas – A Complete Guide, Technical Bulletin No. 41, ICAR - National Research Centre for Banana, Tiruchirappalli, Tamil Nadu. pp. 47. Technical Bulletin 41.
- Nagendran K, Kumari S, Singh AK, Behera TK and Rai N. 2024. Viral Disease album of Vegetable Crops. IIVR Technical Bulletin No. 111, IIVR, Varanasi. pp.120.

Extension Folders

- Karpagam C, Selvarajan R, Ravi I, Harishwar S and Ravichamy P. 2024. Management techniques in TC banana plants during the summer period (Tamil). ICAR – National Research Centre for Banana, Tiruchirappalli, Tamil Nadu. Extension Folder No. 40.
- Mayilvaganan M, Ravi I, Shiva KN, Mailraja VK, Kamaraju K. and Selvarajan R. 2024. Low glycemic banana fruits for diabetics (Tamil). ICAR – National Research Centre for Banana, Tiruchirappalli, Tamil Nadu. Extension Folder No. 39.
- Poorani J, Mohanasundaram A, Thanigairaj R and Baskar N. 2024. Emergence of Mealybug Pests in Banana – Integrated Management (Tamil). ICAR – National Research Centre for Banana, Tiruchirappalli, Tamil Nadu. Extension Folder No. 43.
- Poorani J, Mohanasundaram A, Thanigairaj R and Baskar N. 2024. 'Emergence of Mealybug Pests in Banana – Integrated Management' ICAR – National Research Centre for Banana, Tiruchirappalli, Tamil Nadu. Extension Folder No. 44.



ACCOLADES

Anuradha C Selvarajan R Jebasingh T Sankara Naynar P	Springer Nature-IVS Best Paper Award 2022 for the research paper entitled “Evidence of viral genome linked protein of banana bract mosaic virus interaction with translational eukaryotic initiation factor 4E of plantain cv. Nendran based on yeast two hybrid system study. Virus Disease.32 (1):123-130 during the VIROCON 2024: International Conference- on “Emerging Viruses: Pandemic & Biosecurity Perspectives” held at DRDE Gwalior during 11-13 November, 2024
Nagendran K Balasubramanian V Pothiraj R Selvarajan R	Best oral paper presentation award for the paper on “Molecular Characterization of Banana Bract Mosaic Virus from Northeast India Using High-Throughput Sequencing” at VIROCON 2024: International Conference- on “Emerging Viruses: Pandemic & Biosecurity Perspectives” held at DRDE Gwalior during 11-13 November, 2024
Waghrulkar, PS. Nagendran K. Balasubramanian V Selvarajan R	Best poster presentation award the paper on “Cucumber mosaic virus: An emerging menace to banana cultivation of western plateau in India” presented at VIROCON 2024: International Conference- on “Emerging Viruses: Pandemic & Biosecurity Perspectives” held at DRDE Gwalior during 11-13 November, 2024
Pramod Shelake	Best Oral Presentation Award during the 58th Annual Convention of the Indian Society of Agricultural Engineers (ISAE) and the International Symposium on Agricultural Engineering Education for Aspiring Youth in Transforming Agriculture, jointly organized by ISAE and VNMKV, Parbhani, from 12-14 November, 2024.
A. Mohanasundaram	Member in board of studies for Department of Zoology, Bishop Heber college, Trichy

PERSONALIA

Promotion: Er. D. Ramachandramurthi has been promoted from the grade of Senior Technical Officer (T-6) to the grade of Assistant Chief Technical Officer (T-7/8) w.e.f. 11.08.2023



TRICHY FACTS

Trichy, an ancient city with a vibrant cultural heritage, boasts a history spanning over 1000 years. The Rock Fort temple, dating back to the 7th century, showcases its architectural and historical splendor. The city is renowned for the Grand Anicut, the fourth oldest dam globally, constructed in the 2nd century AD.



தேசிய வாழை ஆராய்ச்சி மையத்தின்

காவேரி நுண்ணுயிர் கலவை

Kaveri Microbial Consortium (KMC)



**இந்த KMC
கிலோ ரூ. 150 க்கு
விற்கப்படுகிறது.**

தேசிய வாழை ஆராய்ச்சி மையத்தின்

பனானா சக்தி

ஐந்து நுண்ணூட்ட 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 ஆராய்ச்சி மையத்தின்

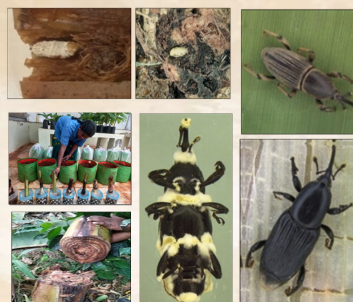
வாழை கூன் வண்டு கொல்லி

(NRCB-Banana Weevil Killer)

(பியூவேரியா பாசியானா / *Beauveria bassiana*)



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



இ. வே. ஆ. கு – தேசிய வாழை ஆராய்ச்சி மையம்

தோகைமலை றோடு, தாயனூர் அஞ்சல், திருச்சிராப்பள்ளி, தமிழ் நாடு, இந்தியா.

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Kalpatharu: Banana for Health and Wealth

NRCB Newsletter : October-December 2024 (Quarterly) Volume 28 (4)

Contact Us

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<https://www.facebook.com/people/ICAR-NRCB>



<https://x.com/ICARNRCB>



<https://www.youtube.com/@icarnrcb8887>

For Location

