



ICAR- National Institute of Secondary Agriculture E-NEWSLETTER



Director's Desk

As the institute enters its 102nd year of service, this milestone offers an opportunity to reflect on our journey and the societal impact achieved through research, innovation, and technology dissemination. This quarter, the institute undertook focused research in secondary agriculture, including identifying alternative mushroom resources and isolating nanocellulose from renewable biomass. Advancement in mechanization- such as drudgery-reducing tools for lac production and a cinchona uprooting system for hilly terrains- highlight our commitment to practical, field-oriented solutions. Capacity building remains central to our mandate. Through demonstrations, exhibitions, exposure visits, surveys, and success story documentation, we continue to equip farmers, entrepreneurs, and rural youth with relevant skills. Key events, including Foundation Day, the Ms. Dorothy Norris Memorial Lecture, and Hindi Pakhwada, further enriched the institutional environment. The signing of MoUs and transfer of technologies to entrepreneurs reinforced the institute's role in promoting innovation-led growth. Continued publication of research outputs and participation in national scientific forums reflect our expanding visibility and relevance. As we move forward, we reaffirm our commitment to innovation, collaboration, and dedicated service to farming communities. I extend my appreciation to all scientists, technical staff, administrative teams, and stakeholders whose contributions continue to strengthen the institute's legacy and impact.



(Abhijit Kar)

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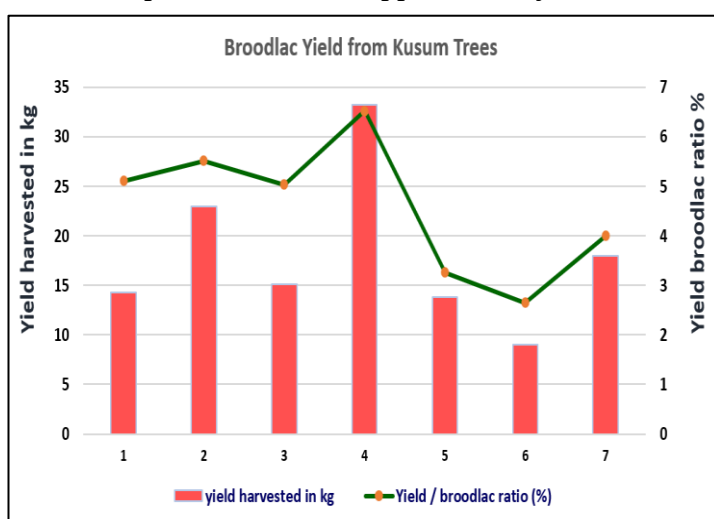
RESEARCH HIGHLIGHTS

Development of a broodlac self-sufficiency model using ber and kusum plant combination for kusmi lac production: first-year evaluation

The self-sufficiency potential of broodlac production using Kusum (*Schleichera oleosa*) and Ber (*Ziziphus mauritiana*) host plants in a 1:8 ratio was assessed with an objective to determine whether broodlac produced on one kusum tree during the summer lac crop could meet the requirement for inoculating eight ber trees in the subsequent winter crop. The investigation included 20 kusum trees and 160 ber plants arranged across 20 plots, subdivided into three groups, while out of the 20 kusum trees, only seven were initially inoculated. All standard lac cultivation practices were uniformly followed across the plots.

The results showed considerable variation in broodlac yield among the plots, ranging from 9.0 to 33.25 kg, with an average yield of 18.06 kg per Kusum tree. The corresponding broodlac used for inoculation ranged from 2.8 to 5.1 kg, giving an average broodlac multiplication ratio of approximately 5.0.

The total yield from the seven inoculated Kusum trees was 126.42 kg, derived from 27.2 kg of broodlac used for inoculation, resulting in an overall multiplication ratio of 4.65. From this yield, 80 kg of broodlac was used to inoculate all 160 Ber plants across the 20 plots, and the remaining 46 kg was utilized for other experiments. This demonstrates that the Kusum–Ber 1:8 host combination model is practically viable for achieving broodlac self-sufficiency, emphasizing the potential of integrating Kusum and Ber plants for sustainable and economically viable lac cultivation systems.



Broodlac yield from kusum trees of seven plots with kusum ber combination in 1:8 ratio

Isolation of *Tremella fusiformis* (snow mushroom) from wild collection

Tremella fusiformis from wild-collected specimens were isolated by inner tissue isolation method with minor modifications. Fresh fruiting bodies were collected from natural habitats within the ICAR–NISA campus, with site and date recorded, and transported to the laboratory under chilled conditions. Several isolation methods including spore print isolation, surface swab method, dilution plate method, and direct plating were evaluated, but pure cultures were successfully obtained through the inner tissue isolation technique.

For this method, fruiting bodies were surface-sterilized by immersion in 70% ethanol for 30 seconds, followed by a brief exposure to 95% ethanol, and then rinsed thoroughly with sterile distilled water. Small inner tissue pieces were aseptically excised from the sterile interior using a scalpel under a laminar airflow cabinet.



Mycelium isolated from wild collected *Tremella fusiformis* (snow mushroom)

These tissue bits were placed onto Malt Extract Agar (MEA) plates and incubated at 25 °C in darkness for 5 days. Emerging mycelial colonies exhibiting typical *T. fusiformis* characteristics: slow-growing, white, and cottony were monitored and selected. The colonies were sub-cultured onto fresh MEA plates to ensure purity and uniformity. The purified isolates were maintained on MEA slants under refrigerated conditions for further physiological and molecular studies.

Summer brood lac production on *Flemingia semialata*: a sustainable solution for new lac cultivation areas

Flemingia semialata is well known as an excellent host for winter Kusmi lac production, but its suitability for summer broodlac generation has remained largely unexplored. A recent study has now demonstrated the successful production of summer broodlac on *F. semialata* during the January–June crop season using drip irrigation, offering a valuable option for emerging lac cultivation regions. The experiment recorded an average broodlac yield of 55.00 ± 4.68 g per bush, lower than the typical 100–150 g obtained in winter, yet significant as a breakthrough for summer cultivation. Notably, this reduced broodlac yield was partly compensated by simultaneous seed production, averaging 20.67 ± 7.46 g per bush, thus enhancing overall economic returns from each plant.

These results are especially important for newly developing lac-growing areas where traditional large host trees such as Kusum (*Schleichera oleosa*) and Ber (*Ziziphus mauritiana*) are not readily available. By adopting *F. semialata* as a dual-purpose host allocating 60% of the area for winter commercial lac and 40% for summer broodlac, farmers can achieve self-sufficiency in broodlac supply and reduce dependence on long-distance procurement.



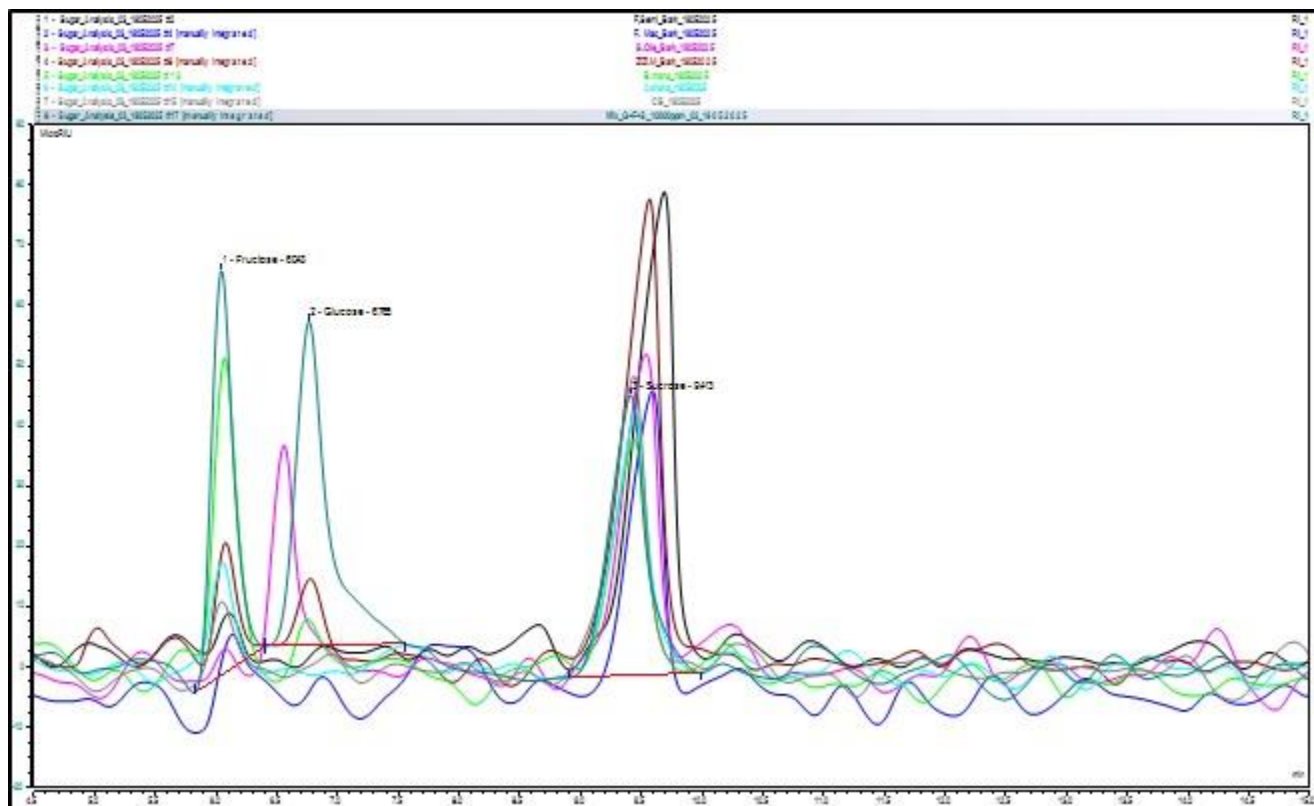
Broodlac harvested from summer lac crop on *F. semialata*

Analysis of phloem sap from different lac host plants

The phloem sap of different host plants viz., *F. semialata*, *F. macrophylla*, *S. oleosa*, *Z. mauritiana*, *B. monosperma*, *C. calothyrsus* and Ashoka (*Polyalthia longifolia*) were collected by centrifugation method. The different sugars were determined by UHPCL from the above collected phloem sap.

Table. Sugar concentration of Phloem sap (ppm/ml) of different host plants

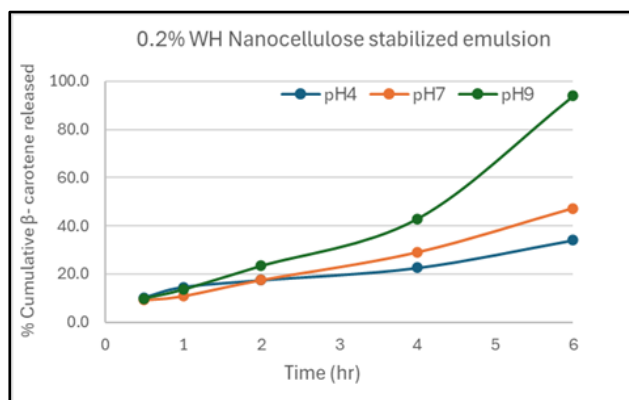
Sl. No.	Lac Host Plant	Fructose	Glucose	Sucrose
1	<i>F. semialata</i>	1,015 ppm	-	17,206 ppm
2	<i>F. macrophylla</i>	3,440 ppm	-	9,879 ppm
3	<i>S. oleosa</i>	-	6,242 ppm	11,178 ppm
4	<i>Z. mauritiana</i>	5,104 ppm	3,492 ppm	30,940 ppm
5	<i>B. monosperma</i>	7,904 ppm	1,476 ppm	7,641 ppm
6	<i>C. calothyrsus</i>	2,708 ppm	-	10,202 ppm
7	<i>Polyalthia longifolia</i>	9,150 ppm	-	27,558 ppm



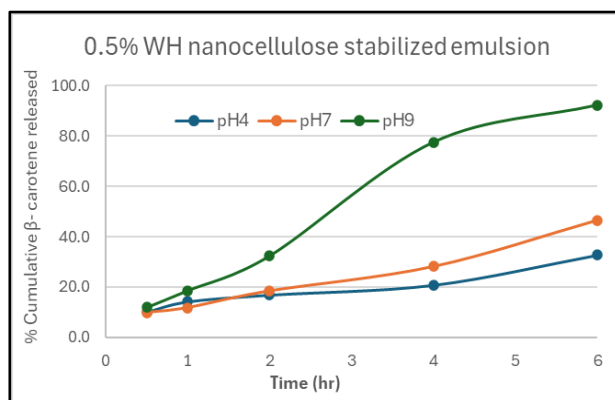
Chromatogram showing sugar concentration of phloem sap (ppm/ml) of different host plants

Release kinetics study of β -carotene from water hyacinth nanocellulose stabilized emulsion

Nanocellulose derived from water hyacinth biomass was successfully extracted using a green, efficient method combining deep eutectic solvent (DES) treatment with ultrasonication. The resulting nanocellulose was used to stabilize emulsions containing β -carotene, a highly unstable bioactive compound. These nanocellulose-stabilized emulsions showed higher encapsulation efficiency. The release behavior of β -carotene from the emulsions was evaluated under different pH conditions (pH 4, 7, and 9). The results showed that release is pH-dependent: the slowest release occurred under acidic conditions (pH 4), moderate release under neutral pH (7), and the fastest release under alkaline pH (9). Among the formulations, the highest β -carotene release (94.02%) was observed from the 0.2% nanocellulose-stabilized emulsion, followed by the 0.5% formulation.



(a)

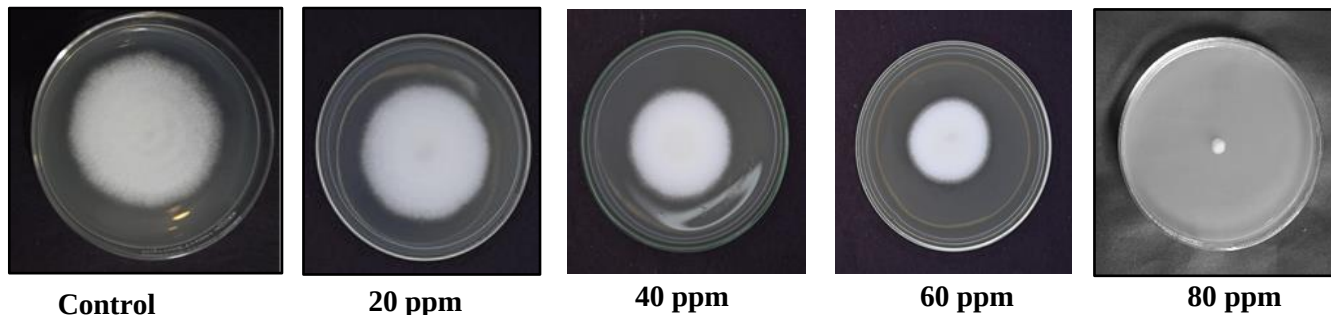


(b)

Release kinetics of the β -carotene from (a) 0.2% and (b) 0.5% nanocellulose emulsion under different pH condition

In-vitro antifungal activity evaluation of shellac nanoparticles (ShNPs)

An experiment was conducted to evaluate the effectiveness of shellac nanoparticle (ShNP) formulations as an eco-friendly, biopolymer-based protective agent against post-harvest fungal pathogens. In vitro tests were carried out on nutrient agar and potato dextrose agar plates against *Colletotrichum gloeosporioides* and *Rhizopus stolonifer*. Antifungal activity was assessed through inhibition zone formation and growth suppression using the poison food method at four concentrations: 20, 40, 60, and 80 ppm. The results demonstrated a clear dose-dependent inhibition of fungal growth. At 48 hours, antifungal activity was lowest at 20 ppm (15.49%) and increased progressively with concentration, reaching 53.52% at 80 ppm. This trend continued over the full observation period, with 80 ppm consistently showing the highest inhibition, reaching 68.75% at 144 hours.



In-vitro fungal growth inhibition of control and different concentrations

Development of a melt-filtration unit for button lac production

A melt-filtration unit with targeted capacity of 5-10 kg/day (8 working hours), consisting of a filtration chamber, rod assembly, strip heaters, collector plate, handle, and power control unit has been developed. All components of the melt-filtration unit were made from stainless steel (SS 304). The unit was evaluated using multiple parameters, including filtration time, capacity, performance efficiency, and energy consumption. Performance evaluation was carried out at four melt-filtration temperatures (MFTs): 100, 110, 120, and 130 °C. Results indicated that yield and capacity increased as MFT rose from 100 °C to 130 °C, while filtration time and energy consumption decreased with higher MFT. The capacity ranged from 0.86 to 1.25 kg/h across the tested temperatures. Performance efficiency varied from 82.29% to 87.25%, and energy requirements ranged from 1.02 kWh to 1.49 kWh per batch, demonstrating the effectiveness of the developed melt-filtration unit.



Melt-filtration unit for button lac

Vertical uprooting equipment for Cinchona trees in hilly terrains

Cinchona bark is a valuable source of quinine and other alkaloids used in medicines, beverages, dyes, rubber processing, photography, and optics. However, productivity has declined due to reduced bark quality and limited adoption of modern agricultural practices. At the end of their productive life (7-10 years), cinchona trees must be uprooted, a task traditionally done manually. This manual process is extremely labor-intensive, requiring 6-8 workers to remove only 3-4 trees per day. To address this challenge, ICAR-National Institute of Secondary Agriculture, Ranchi has developed a vertical uprooting equipment suitable for cinchona trees grown vertically in nearly level plantation areas and limited accessibility. The user-friendly system includes a detachable vertical frame, side legs, a top horizontal structure, a hydraulic system, a power pack, and a lightweight petrol generator.



Mechanized uprooting of cinchona tree



Uprooted cinchona tree

Overall dimension of the developed vertical uprooting equipment frame structure were 1800 mm, 910 mm and 1430 mm with each side frame dimension 910 mm length, 300 mm width and 1330 mm height however, the dimension of top horizontal base frame structure is 1550 mm in length, 300 mm in width and 100 mm in height.

While manual uprooting of trees (diameter 200-250 mm) takes around 120 minutes per tree, the mechanized method including assembly and preparation takes only about 15 minutes. This represents an 87.5% reduction in uprooting time and a 50% reduction in manpower, with uprooting loads of 4.5-5.5 tonnes achieved through the hydraulic mechanism. Workers experienced high exertion during manual operations, whereas mechanized uprooting involved minimal physical effort. Overall, the mechanized method increased daily uprooting capacity by 87.5% and reduced the uprooting cost per tree by 88.67%, offering a highly efficient and practical solution for cinchona plantations in difficult terrain.

Translational research to promote Secondary Agriculture

Technology dissemination using social media platform

Nine short educational videos covering key aspects and technologies of scientific lac cultivation, processing and value addition and secondary agriculture products were developed and disseminated through the institute's official social media platforms (YouTube, Twitter, Facebook, and Instagram). The topics included: (i) Brood Lac Dipping: Why, When, and How to Use It?,

(ii) Lacilyzer: A Digital and Smart Solution for Lac Color Indexing, (iii) Application of Pesticides and Fungicides in Scientific Lac Cultivation: Why, When, and How to Use Them?, (iv) Lac cultivation through High density Kusum planting, (v) Brood lac inoculation in *Flemingia semialata*, (vi) Brood lac inoculation in Ber tree, (vii) Button lac production using electric bhatta, (viii) Nutrient management in *Flemingia semialata* and (ix) Shree Anna Saathi: A natural, gluten-free binder for millet flour. These videos aim to promote awareness and adoption of institute developed technologies, highlight farmer led innovations, and support stakeholders in improving lac productivity and quality.

Digital leap impact

Over three months, ICAR–NISA’s digital extension efforts its official YouTube and social media platforms (Facebook, Twitter, Instagram) achieved 61,011 views, with 97% from India. Viewership also came from Nepal, Pakistan, UAE, South Korea, and Bangladesh, reflecting regional interest in sustainable lac cultivation and value-added products. States such as Bihar, Madhya Pradesh, Maharashtra, and Uttar Pradesh showed the highest engagement. Notably, 67% of viewers were below 24 years, highlighting strong youth outreach. The initiative effectively enhanced technology dissemination, visibility of climate-resilient practices, and support for income enhancement among small and tribal farmers.

Policy support for lac-based agroforestry

Under MGNREGA’s Birsa Harit Gram Yojana, systematic plantation of lac hosts like kusum (*Schleichera oleosa*) and *Flemingia semialata* is being promoted with technical collaboration from ICAR–NISA. In Phase I, 300 small and marginal farmers (0.3–0.5 acre) are receiving technical guidance, inputs, and financial support to establish lac-based agroforestry models. The initiative enhances income security, generates rural employment, and strengthens climate-resilient livelihoods. ICAR–NISA is also contributing to policy guidelines, monitoring systems, and capacity-building modules aligned with national priorities in secondary agriculture.

EDUCATIONAL AND CAPACITY BUILDING PROGRAMMES

Sl. No.	Name of programme	No. of programme/ batch	No. of beneficiaries
1	Farmers’ Training programme on “Scientific methods of Lac cultivation, primary processing and utilization”	3	158
2	One day training cum Exposure visit Programme	6	257
3	Students training on Scientific lac cultivation and beekeeping (5 days)	1	21
4	Technology transfer/ training on process, product and quality evaluation	3	6
Total		13	442

EVENTS

ICAR-NISA celebrated its 102nd Foundation Day

ICAR-NISA, Ranchi celebrated its 102nd Foundation Day on September 20, 2025 with great enthusiasm. Dr. Shyam Narayan Jha, DDG (Engineering), ICAR graced the occasion as Chief Guest. Dr. S. C. Dubey, Vice Chancellor, Birsa Agricultural University, Ranchi and Dr. Sujay Rakshit, Director, ICAR- Indian Institute of Agricultural Biotechnology, Ranchi were Guests of Honour. Dr. Abhijit Kar, Director, ICAR-NISA welcomed the dignitaries and outlined the institute's achievements and strategic roadmap. Dr. Jha appreciated the institute's R&D efforts, particularly the development of a gluten-free binder for millet roti. He emphasized its potential in promoting nutritious, millet-based products. The Guests of Honour lauded the institute's significant contributions to the lac sector and secondary agriculture. They also expressed satisfaction in collaborating under the unified framework of One ICAR. On the occasion of its Foundation Day, ICAR-NISA signed three MoUs with Aryavrat Agrotech Pvt. Ltd. (Deoghar), DSR Garuda Aerials Pvt. Ltd. (Khunti), and Shubharambh (Ranchi) to strengthen collaborative initiatives in agriculture and allied sectors. The event also witnessed the release of few publications by the institute – the annual Hindi magazine *Laksha 2025*, booklet *Beekeeping: A Profitable Enterprise* and leaflets *Lac dye-based Natural Alta: A liquid cosmetic for feet decoration*, *Natural glue-based sticky insect trap: Lac resin modified as a non-drying adhesive* and *Lac color index analyser: An electronic, handheld, low-cost, Make-in-India device for quality analysis of lac resin*. The programme was graced by former officials of the institute, officers from other ICAR institutes, progressive farmers and ICAR-NISA staff members. The progressive farmers expressed their gratitude towards the institute and shared their thoughts during the event. The event highlighted ICAR-NISA's continued commitment to agricultural innovation and rural development.



Glimpses of foundation day celebration at ICAR-NISA

14th Ms Dorothy Norris Memorial Lecture

The ICAR-National Institute of Secondary Agriculture, Ranchi organized the 14th Ms Dorothy Norris Memorial Lecture on the theme "Empowering Secondary Agricultural Processes to Build a Thriving Bio-based Economy: Strategies for Achieving a Developed and Self-Sufficient India" on September 24, 2025. Dr. Sanjay Kumar, Chairman, Agricultural Scientists Recruitment Board (ASRB), New Delhi delivered the memorial lecture as the Chief Guest. Dr. Abhijit Kar, Director, ICAR-NISA, welcomed the dignitaries and emphasized the enduring significance of Dr. Dorothy Norris's pioneering work as founding director of erstwhile Indian Lac Research Institute. Dr. Sujay Rakshit, Director, ICAR-IIAB, Ranchi also graced the event. In his lecture, Dr. Sanjay Kumar underlined the transformative potential of secondary agriculture in realizing the vision of Viksit Bharat and Atmanirbhar Bharat.

He highlighted strategies such as residue valorization, post-harvest innovation, technology diffusion, and MSME empowerment as vital steps in strengthening India's bio-economy. Dr. Sanjay Kumar also called upon agri-tech institutions to prioritize mechanization, reduce imports, and lower production costs. He stressed the need to utilize indigenous resources to reduce dependency on high-value imports, such as asafetida, rose oil, tulips, and medicinal compounds. He urged greater collaboration among institutions, industries, and startups to bridge the lab-to-market gap and establish India as a global leader in sustainable bio-economy.



14th Ms Dorothy Norris Memorial lecture by Dr. Sanjay Kumar, ASRB

Celebration of Hindi Ullas Pakhwada- 2025

To promote and encourage the progressive use of Hindi in daily official work, the institute observed *Hindi Ullas Pakhwada* from September 1-15, 2025. A series of competitions including essay writing, Hindi grammar, noting and drafting, office terminology, quiz, debate, antakshari, unicode typing, and a Hindi workshop were organized during the fortnight. Officers and staff from scientific, technical, and administrative wings participated enthusiastically. The activities aimed to strengthen the emotional connect with Hindi, enhance work efficiency, and encourage its natural and spontaneous use as the Official Language.

On September 20, 2025, during the institute's 102nd Foundation Day, winners of the Hindi Pakhwada competitions were felicitated with prizes and certificates by distinguished guests. Authors of the best articles published in last year's house journal *Laksha 2024* were also honored. *Hindi Ullas Pakhwada-2025* not only deepened the institute's affinity for Hindi but also marked an important step toward strengthening its use as an active and integral part of workplace culture.



Guests presenting certificates to winners of Hindi Pakhwada 2025

HUMAN RESOURCE DEVELOPMENT

Workshop on MATLAB Tools for Agricultural Innovation Organized at ICAR-NISA

ICAR-NISA, Ranchi organized a three-day national workshop and hands-on training on “Empowering Agricultural Innovation with MATLAB, Simulink & ThingSpeak” in collaboration with MathWorks Inc. The workshop was held from August 5 to 7, 2025, with 23 participants from ICAR-CIAE, Bhopal, ICAR-CIPHET, Ludhiana, ICAR-CIWA, Bhubaneswar, ICAR-IIAB, ICAR-RCER, and ICAR-NISA, Ranchi. The inaugural programme was attended by Dr. K. P. Singh (ADG, FE); Dr. Abhijit Kar, Director, NISA (online); Heads of Divisions; scientists; officials; and trainers from MathWorks- Mr. Ramana Anchuri, Dr. Nisha Chetana Sastry, Ms. Zahida Vaseem, Dr. Viju Ravichandran, Dr. Pranav, Mr. Janardan Mandal along with ELMAX officials. Dr. Abhijit Kar welcomed the participants and dignitaries and emphasized the importance of advanced analytical tools in agricultural research. Dr. Niranjan Prasad, Head, ABA Division, briefed the participants about the institute’s background. In his address as Chief Guest, Dr. K. P. Singh encouraged active participation and highlighted the relevance of the MATLAB platform for modern data analysis in an era driven by machine learning, deep learning, artificial intelligence, IoT, and big-data analytics- key components of Industry 4.0. Ms. Zahida Vaseem from MathWorks introduced about various MATLAB applications, while Dr. Debabandya Mohapatra, Convenor of the workshop, proposed the vote of thanks and outlined MATLAB tools useful in agriculture. Over the three days, participants were trained in concepts of data analysis, statistical tools, optimization, curve fitting, image processing, IoT applications, and machine learning and deep learning techniques, followed by extensive hands-on sessions.



Trainees from ICAR institutes at the workshop



PARTICIPATION IN MELA /EVENTS

ICAR-NISA actively participated in three major Kisan Melas and agricultural exhibitions organized by leading institutions, including the Ministry of Agriculture & Farmers Welfare, ICAR, State Departments, and prominent NGOs. The institute showcased its innovative technologies and value-added products related to lac cultivation, processing, and secondary agriculture, strengthening technology dissemination and farmer awareness. The exhibits attracted a wide range of farmers and stakeholders, offering practical insights into sustainable lac production, pest management, and value addition.

Live demonstrations received significant attention, facilitating meaningful expert–farmer interactions and extensive distribution of technical literature. Shri Santosh Kumar Gangwar, Hon’ble Governor of Jharkhand, along with senior officials from central and state agencies, visited the ICAR–NISA stall and appreciated the institute’s contributions toward lac-based livelihoods, efficient bio-resource utilization, and rural agro-entrepreneurship. The institute’s outreach efforts were widely praised for promoting knowledge transfer, capacity building, and growth in the secondary agriculture sector.



Hon’ble Governor visiting ICAR-NISA stall

PUBLICATION AND PUBLICITY

Research papers

Ghoshal, S., Dutta, A., Mandal, A., & Saha, S. (2025). An optimized technique for ultrasound-assisted extraction of xanthophylls from *marigold* (*Tagetes erecta* L.) using saturated fatty acid-based hydrophobic deep eutectic solvent. *Journal of Molecular Liquids*, 437, 128398.

Kumari, M., Tiwary, A., Sheel, R., Roy Chowdhury, A., Sarkar, B., Mukherjee, K., & Maity, D. (2025). Evaluating the molecular basis of nanocalcium-induced health regulation in zebra fish (*Danio rerio*). *Bioengineering*, 12(10), 1016.

Rao, S. K., Naresh, T., Krishna, V. A., Dhurua, S., Kar, A., Lohot, V. D., & Sharma, K. K. (2025). Occurrence of lac insect and its host plants in Andhra Pradesh, India. *Plant Archives*, 25(Supplement 2), 453–460.

Popular articles

Ghosh, J., Ghosal, S., Lohot, V. D., Sinha, N. K., & Vidyakar, V. (2025). From fruits to lac: How pruning transforms ber trees into profit powerhouses. *Agriculture & Food: e-Newsletter*, 7(8), 105–109.

Udaykumar, M. S., Pandey, S. K., Pramanik, A., Kar, A., & Mahto, A. K. (2025). From mud walls to millionaire: The lac legacy of Joydeb Mahato. *Agritech Today*, 3(4), 80–81.

Following popular articles were published in Laksha 2025, in-house magazine of ICAR-NISA:

- खरीफ फसलों में समेकित सूत्रकृमि प्रबंधन: दीपक राय, पंकज नौटियाल, दुष्यंत कुमार राघव एवं राजन चौधरी, 1-2
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Book

Schulz, H., Jayakumar, V. S., & Prasad, N. (2025). *Natural gums and resins: Botany and sustainable uses in medicine, nutrition, perfumery and cosmetics* (p. 377). CABI (ISBN 978-1-80062-667-6)

Book Chapters

Mollazadeh, A., Ghaffariannia, H., Schulz, H., Akaberi, M., Giri, S. K., & Emami, S. A. (2025). Historical significance of gums and resins in cultural practices, cosmetics and nutrition in the Middle and Far East. In H. Schulz, V. S. Jayakumar, & N. Prasad (Eds.), *Natural gums and resins: Botany and sustainable uses in medicine, nutrition, perfumery and cosmetics* (pp. 1–37). CABI.

Prasad, N., & Schulz, H. (2025). Valuable chemical constituents and properties. In H. Schulz, V. S. Jayakumar, & N. Prasad (Eds.), *Natural gums and resins: Botany and sustainable uses in medicine, nutrition, perfumery and cosmetics* (pp. 107–140). CABI.

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Folders

Thombare, N., Sharma, D., & Kar, A. (2025, September). *Lac dye-based natural alta: A liquid cosmetic for feet decoration* (pp. 1–4). ICAR–National Institute of Secondary Agriculture.

Thombare, N., Mohanasundaram, A., Sharma, K. K., & Kar, A. (2025, September). *Natural glue-based sticky insect trap: Lac resin modified as a non-drying adhesive* (pp. 1–4). ICAR–National Institute of Secondary Agriculture.

Thombare, N., Kumar, S., Bhondekar, A. P., Sharma, A., Kumar, R., Bagchi, S., Ansari, M. F., & Kar, A. (2025, September). *Lac color index analyser: An electronic, handheld, low-cost, Make-in-India device for quality analysis of lac resin* (pp. 1–4). ICAR–National Institute of Secondary Agriculture.

Participation of Scientist in Conferences/ Meeting/ Seminars/ Symposia/ Workshop/ Trainings

Senior scientists Dr. Arnab Roy Choudhary, Dr. Nandkishore Thombare, Dr. Anirban Dutta, Dr. Sakharam Kale and scientists Dr. Archana Mahapatra, Dr. Priyanka Sakare, Dr. Mridusmita Debnath, Dr. Udaykumar, M. S. participated in 3-days Hands-on Workshop on "Empowering Agricultural Innovation with MATLAB, Simulink, and ThinkSpeak" from August 5 to 7, 2025 organized by ICAR- National Institute of Secondary Agriculture, Ranchi in collaboration with MathWorks Inc. at ICAR-NISA, Ranchi.

Dr. Nandkishore Thombare, Sr. scientist participated and presented paper titled 'स्पेक्ट्रोस्कोपी आधारित गुणवत्ता नियंत्रण: खाद्य सुरक्षा की दिशा में नई प्रगति' in राष्ट्रीय वैज्ञानिक हिन्दी संगोष्ठी on विकसित भारत - 2047 का लक्ष्य प्राप्त करने हेतु कृषि में यंत्रीकरण, कृत्रिम बुद्धिमत्ता, एवं रोबोटिक की भूमिका held on September 25, 2025 at ICAR-NINFET, Kolkata.

Dr. Archana Mahapatra, Scientist participated and presented paper titled 'बागवानी अपशिष्ट से सेल्यूलोज निष्कर्षण: सतत संसाधन प्रबंधन की संभावनाएँ' in राष्ट्रीय वैज्ञानिक हिन्दी संगोष्ठी on विकसित भारत - 2047 का लक्ष्य प्राप्त करने हेतु कृषि में यंत्रीकरण, कृत्रिम बुद्धिमत्ता, एवं रोबोटिक की भूमिका held on September 25, 2025 at ICAR-NINFET, Kolkata.

Dr. Priyanka Sakare, Scientist participated and presented paper titled 'खाद्य अपशिष्टों से प्राकृतिक रंगों का निष्कर्षण' in राष्ट्रीय वैज्ञानिक हिन्दी संगोष्ठी on विकसित भारत - 2047 का लक्ष्य प्राप्त करने हेतु कृषि में यंत्रीकरण, कृत्रिम बुद्धिमत्ता, एवं रोबोटिक की भूमिका held on September 25, 2025 at ICAR-NINFET, Kolkata.

Awards

A. Mahapatra, P. Sakare, A.R. Choudhury, S. Kale received best article award for article 'पॉलीसेकेराइड के स्रोत के रूप में उद्यानिकी अपशिष्ट का उपयोग: संसाधन प्रबंधन के लिए एक शाश्वत दृष्टिकोण' published in Hindi magazine Lasksha-2024, by ICAR-NISA, Ranchi.

Patent

Roy Chowdhury, A., Thombare, N., Kale, S. J., Gupta, A. K., Giri, S. K., & Kar, A. (2025). *Natural gum-based gluten-free millet flour composition* (Indian Patent Application No. 202531089880, filed September 20, 2025).

Visits

- A field visit was conducted on July 03, 2025, to document the success story of Shri Joydeb Mahato, a successful lac farmer from Putidih village, Purulia, West Bengal. His farmer-led innovation- lac cultivation in high-density Kusum plantations was recorded along with a detailed success story video. Both videos have been uploaded on the institute's official social media platforms.
- Dr. Udaykumar M. S., Scientist (Agricultural Economics), along with newly joined scientists of the institute visited Tajna Shellac Industry and Parwati Lakh Udyog, Khunti, on July 29, 2025. The team interacted with trader-entrepreneurs Mr. Arun Sharma, Mr. Rajesh Sarogi and Mr. Shagun Sarogi and discussed the production and export of lac products, emerging opportunities in the lac sector and prevailing market trends. Current prices of seed lac, button lac, shellac and related products were also collected during the visit.
- Field visits were carried out on August 13, 20, and 22, 2025, to assess the impact of ICAR–NISA's training programs through structured personal interviews using a standardized questionnaire. Surveys were conducted across various villages in the Ormajhi, Angada, and Kamdara blocks. Data was collected from 150 trained farmers who had participated in ICAR–NISA's programs on scientific lac cultivation, primary processing, and utilization.



MISCELLANEOUS

MOU signed and Technology/Know-how transfer by ICAR-NISA, Ranchi

- MoU has been signed between ICAR–NISA and Rangmunch Club, Anandpuri Chowk, Harmu, Argora, Ranchi on September 03, 2025 for providing technical guidance, exposure, and knowledge-sharing support in *secondary agriculture, modern farming practices, agri-processing, and product development*. The MoU will remain in force until September 02, 2030.
- MoU has been signed between ICAR–NISA and DSR Garuda Aerials Pvt. Ltd., Village Hutar, P.O. Fudi, Khunti on September 20, 2025 for the *establishment of a Remote Pilot Training Organization (RPTO) in PPP mode for drone training at KVK, Khunti*. The MoU is valid until September 19, 2028.

- MoU has been signed between ICAR–NISA and Shubharambh, Ashok Nagar Society Marketing Complex, Ranchi on September 20, 2025 for the *utilization of the honey processing facility, technical support for bee hive product development by ICAR–NISA, and commercial processing/product development by Shubharambh*. The MoU is valid until September 19, 2028.
- MoU has been signed between ICAR–NISA and Aryavrat Agrotech Private Limited, Baskupi, Sarath, Deoghar, Jharkhand on September 20, 2025 for the *utilization of the honey processing facility and technical support for bee hive product development by ICAR–NISA, and commercial processing/product development by the company*. The MoU will remain in force until September 19, 2028.

The following technologies and process/product know-how have been transferred to entrepreneurs under the Entrepreneurs’ Programme:

Sl. No.	Date	Technology Transfer	Trainees	Firm/Organization
1	July 08-17, 2025	Lac Dye	Mr. Vikas Bakti, Mrs. Sarita Devi & Mrs. Gita Devi of Vedic lac Foundation	Sponsored by Mukhya Mantri Laghu evam Kutir Udyam Vikas Board, Ranchi, Jharkhand
2	August 04-08, 2025	Dewaxed Bleached Lac	02 Entrepreneurs (Mr. Saket Saraogi & Mr. Shagun Saraogi) from Parwati Lakh Udyog, Khunti, Jharkhand.	Parwati Lakh Udyog, Khunti, Jharkhand.
3	August 11-15, 2025	Dewaxed Bleached Lac	01 Entrepreneurs (Mr. Pranay Agarbala) from Raj Kumar Shellac, West Bengal	Raj Kumar Shellac, West Bengal

Participation in Entrepreneurship Awareness Program (EAP)

Dr. Jyotirmoy Ghosh, Principal Scientist and Dr. Udaykumar, M. S., Scientist, ICAR-NISA participated as Chief Guests in one day Entrepreneurship Awareness Program (EAP) for SC farmers organized by Br. MSME-DFO, Durgapur, Ministry of MSME, Govt. of India in Association with Sheva Ashram Biswa Shanti Dham Mission, Bankura at Jhalda Co-operative Hall, Jhalda, Purulia on September 09, 2025. Scientists highlighted the exciting entrepreneurial opportunities in the lac sector and secondary agriculture, paving the way for innovation and rural growth.



Scientists interacting during EAP

Participation in the biannual meeting of nagar rajbhasha implementation committee

Mrs. Anima Prabha (Senior Technical Officer) and Mr. Indrajeet Kumar (Technician) represented ICAR–NISA at the biannual meeting of the Nagar Rajbhasha Implementation Committee (NARAKAS), Ranchi, held on September 12, 2025. On this occasion, the Hon'ble Chairman, Mr. Rajesh Kumar Jha, inaugurated the fifth issue of the departmental magazine *Rajbhasha Johar*. Senior officials from various central government offices in Ranchi actively participated in the program. The meeting included discussions on the effective implementation of Hindi as the Official Language, the regular publication of departmental magazines, and other Hindi-related initiatives. The event not only emphasized the importance of promoting Hindi in official work but also provided a common platform for institutions to share experiences, challenges, and best practices.

Foreign delegates visit

Delegates from France and Belgium visited ICAR-NISA on August 25, 2025 and interacted with the Director and scientists. The delegates visited the institute's research farm and museum, and were apprised of ongoing R&D activities in lac cultivation, lac-based value-added products, and secondary agriculture technologies for sustainable rural livelihood enhancement.



Delegates visiting the institute museum

Other

- Dr. N. K. Sinha, Principal scientist attended the 9th meeting of the IMC of ATARI, Patna (Zone IV) on August 18, 2025.
- Dr. N. K. Sinha, Principal scientist served as an external examiner for the viva-voce of an M.Sc. student in the Department of Plant Physiology and Biochemistry, BAU Sabour, on August 20, 2025.
- Dr. S. K. Giri, Principal scientist & Head was nominated as a member of the Institute Management Committee (IMC) of ICAR–CIAE, Bhopal, and attended the 55th IMC Meeting held on August 28, 2025.
- Dr. Debabandya Mohapatra delivered an invited talk on **विक्सित भारत-२०२४७ का लक्ष्य प्राप्त करने हेतु खाद्य प्रसंस्करण उद्योग में आधुनिक तकनीकों का अनुप्रयोग** in the **राष्ट्रीय वैज्ञानिक हिन्दी संगोष्ठी** organized by NINFET, Kolkata, on September 25, 2025.
- Dr. Debabandya Mohapatra attended the Initial Screening committee (ISC) meeting for the evaluation of projects received under INDIA-SPAIN JOINT CALL FOR R&D&I PROJECTS 2024, hosted by Technology Development Board, Department of Science & Technology, Govt. of India, as Technical Expert

Joining

Dr. Simran Arora, Scientist on July 7, 2025

Dr. Bhukya Jithender, Scientist on July 7, 2025

Dr. Patil Rajvardhan Kiran, Scientist on July 7, 2025

Promotion

Ms. Manju Devi has been promoted from MTS to T-1/Technician w.e.f. August 25, 2025

Retirement

Shri Madi Kachhap
MTS
31.07.2025

Editor-in-chief

Dr. Debabandya Mohapatra

Editor

Dr. Archana Mahapatra

Technical Assistance

Mr. Indrajeet Kumar

Published by

Dr. Abhijit Kar, Director

ICAR-National Institute of Secondary Agriculture, Namkum, Ranchi - 834 010, Jharkhand

Phone: 0651-2260117, 0651-2261156 (Director)

Fax : 0651-2260202

E-mail: director.icar.nisa@gmail.com

URL : <https://nisa.res.in>