



1. PUSA Krishi Received Entrepreneurship Leadership Award at UP State Agriculture Conclave 2024

Dr. Akriti Sharma, CEO of Pusa Krishi, was honored with the Entrepreneurship Leadership Award at the UP State Agriculture Conclave 2024, organized by the Indian Chamber of Food & Agriculture (ICFA) in Lucknow on 31st August 2024.

The recognition solidifies Pusa Krishi's role as a key player in fostering agricultural innovation and excellence. It underscores Pusa Krishi's vital role as a leading incubator in the agricultural sector. The organization is renowned for nurturing and supporting agri-startups, helping them navigate challenges and drive innovation. During the conclave, Dr. Sharma also participated in a panel discussion focused on the Indian agri-startup ecosystem. She provided valuable insights into the sector's challenges and shared innovative solutions that could shape the future of agriculture in India.



Highlights

- Received Entrepreneurship Leadership Award at UP State Agriculture Conclave 2024
- Partnership – Signed MoU with Yamaha Motors
- IP Management
- Technology Commercialization
- Corporate Membership
- Incubation Activities – UPJA, ARISE & SHITIJ 2024
- Agripreneurship Development Programs

2. PARTNERSHIP

DRIVING INNOVATION: PUSA KRISHI AND YAMAHA MOTORS SIGN LANDMARK MOU

On July 19, 2024, Pusa Krishi and Yamaha Motors Solutions India (YMSLI) signed an MoU to strengthen collaboration in agri-tech startup innovation eco-system.

The agreement, witnessed by key representatives from IARI and YMSLI, focuses on supporting startup incubation, market access, pilot demonstrations and commercialization, leverage Yamaha's technological expertise etc. The agreement was signed by Dr. Viswanathan Chinnusamy, Joint Director (Research), IARI and Mr. Lalit Sharma, Innovation Head, YMSLI in the presence of Dr. Akriti Sharma, CEO, Pusa Krishi, Mr. Vipul Shah, Marketing Manager, Pusa Krishi and Mr. Manish Pipalani, Lead Startup Innovation, YMSLI.



3. IP MANAGEMENT

Pusa Krishi plays an active role in Intellectual Property Management of ICAR-IARI. In the last quarter, 5 Patents were filed and 2 were granted, the details of which are given below:

- **A Telerobotic Target-Specific Pesticide Applicator for Greenhouse & Open-Field** – The invention provides a telerobotic target-specific pesticide applicator capable of spraying pesticides selectively, based on the presence and height of plants and will also be suitable for open field crops for its versatility use. The telerobotic target-specific pesticide applicator comprises mainly a prime mover, a target-specific spraying system and an electronic control unit for both prime mover navigation and spraying system.
- **Water Soluble Powder Formulation of Xanthophylls & Process Thereof**– The invention relates to the development of a water-soluble powder formulation of xanthophylls extracted from natural sources. The process includes dissolving the total xanthophyll pigment complex at ambient temperature without any saponification or separation into a lipophilic green solvent which is emulsified with an aqueous solution of a natural biopolymer and surfactant.
- **Biosurfactant Formulation for Degradation of Hydrocarbons in Soil & Method of Preparation Thereof** – The invention relates to biosurfactant formulation for degradation of polyaromatic hydrocarbons in soil and method of preparation thereof. The application of biosurfactant formulation will help in degrading carcinogenic pollutants like naphthalene, fluorene, phenanthrene and pyrene.
- **Electronic Safety Alarm and Brake Device for Chaff Cutter** – The invention determines an Electronic Safety Alarm and Brake Device that can detect the presence of hands and other body parts near the danger zone of the chaff cutter machine.
- **Energy Based Custom Hiring Monitoring Meter for Tractor** – The invention calculates the custom hiring charges based on actual energy consumed during agricultural operations. The monitoring meter comprises of fuel flow mechanical unit, fuel flow sensors, monitoring meter controller, programming code, Cloud configuration setting and mobile App.

- **The 3' Polymorphic Primers for Species-Specific Detection of Begomovirus** – The present invention relates to the process and primer sets for specific detection of begomoviruses at species level by PCR. This specific detection is utilized for the assessment of leaf curl resistance in chilli genotypes and also in determining the distribution of these begomoviruses in tomato.
- **UAN cum Seed Applicator** – The innovative UAN cum Seed Applicator performs UAN fertilizer metering, seeds application placement in furrow, uniform distribution of UAN and its precise placement in furrow at optimum spacing from seeds to avoid seeds damage and thereby enhances nutrient use efficiency.

4. TECHNOLOGY COMMERCIALIZATION

Tech commercialization plays an important role in making the technologies reach to the end users in an effective and faster way. ICAR-IARI develops technologies with substantial commercial potential that are ready to use by businesses. Under the Lab to Land Initiative, from July to September 2024, 23 technologies of ICAR-IARI were commercialized to 12 industry partners.

S. No.	Name Of technologies	Features
1	Chilli c.v. Pusa Jawala	It is India's most popular hot pepper variety, known for its high yield of 200 q/ha for green chili and 10-15 q/ha for dry chili, ideal for spicy Indian cuisine.
2	HD 3385	HD 3385 is a high-yielding, lodging-tolerant and disease-resistant wheat variety with superior yield and resilience, making it a valuable addition for the Northern Plains.
3	HD 3386	It is a high-yield, disease-resistant and optimized for the Northern Plains with a potential yield of 76.9 quintal/hectare.
4	HQPM 5 Improved	The biofortified maize hybrid 'Pusa HQPM-5 Improved' is enriched with lysine, tryptophan, and provitamin-A, providing essential nutrients for improved human health, especially beneficial for vision and immunity.
5	Marigold c.v. Pusa Bahar	It is an open-pollinated African marigold variety with vibrant yellow blooms that flowers in 90-100 days and produces 50-60 large flowers per plant, ideal for garden bedding & floral decorations.
6	Marigold c.v. Pusa Narangi Gaiinda	This African marigold variety flowers in 125-135 days and produces compact deep orange flowers with ruffled florets. It gives flower yield of 250-300 quintals/ha.
7	Methi c.v. PEB	Is a high-yielding, early-maturing fenugreek variety, producing 700-800 q/ha of flavorful leaves, ideal for year-round cultivation and valued for culinary and medicinal uses.
8	Onion c.v. Pusa Red	Pusa Red is a high-yielding onion variety with deep red bulbs, excellent storage quality, and adaptability, yielding 250-300 q/ha, perfect for diverse regions in India.

S. No.	Name Of technologies	Features
9	Palak c.v. All Green	All Green is a high-yield spinach variety with vibrant leaves, providing 5-6 cuttings at 15-20 day intervals, and a total leaf yield of 500-600 q/ha, perfect for commercial and home cultivation.
10	PB 1509	PB 1509 – the first early-maturing, high-yielding Basmati rice variety from IARI, known for its strong aroma, extra-long grains, and resilience against lodging and shattering.
11	PB 1847	Pusa Basmati 1847 is a high-yielding, semi-dwarf Basmati rice variety derived from Pusa Basmati 1509, featuring inbuilt resistance to bacterial blight and blast, excellent grain quality, strong aroma, and suitability for cultivation in Basmati GI regions like Delhi, Punjab & Western UP.
12	PB 1885	Pusa Basmati 1885 is a semi-dwarf, high-yielding Basmati rice variety derived from Pusa Basmati 1121, with built-in resistance to bacterial blight and blast, excellent grain quality, strong aroma, and suited for Basmati GI regions like Delhi, Punjab & Haryana.
13	PB 1979	Pusa Basmati 1979 – a high-yielding, herbicide-tolerant rice variety derived from Pusa Basmati 1121, with enhanced weed resistance and premium grain quality. It offers a cost-effective solution for both direct-seeded and transplanted systems, retaining the desirable aroma, long grain, and cooking quality of its parent, Pusa Basmati 1121.
14	PB 1985	Pusa Basmati 1985 – a high-yield, herbicide-tolerant variety designed for efficient, cost-effective weed management in dry direct-seeded and transplanted rice cultivation, with quality traits akin to Pusa Basmati 1509.
15	Pigeon pea variety Pusa 1431	Pusa 1431 is a high-yielding mungbean variety that matures in 56-66 days, offering resistance to major diseases like MYMV and leaf spots. It yields around 12-14 quintals per hectare and is ideal for spring cultivation in the Delhi NCR region.
16	Pusa Arhar 16	Pusa Arhar 16 is an early-maturing, high-yield pigeonpea variety maturing in 120 days, ideal for dense planting and mechanized harvesting. Its early maturity allows farmers to grow additional crops, enhancing farm productivity.
17	Pusa Arhar 2017-1	This early-maturing, indeterminate plant type is compact and semi-erect, allowing for dense planting. It yields an average of 20.45 q/ha in trials and is ideal for close-spacing, sole cropping setups (30 cm row spacing, 15 cm plant spacing).
18	Pusa Arhar 2018-4	Pusa Arhar 2018-4 is an early-maturing pigeonpea with high yield potential (up to 2306 kg/ha), bold seeds, and strong resistance to diseases and pests. It contains 22.75% protein and outperforms check varieties in trials across the NWPZ.

S. No.	Name Of technologies	Features
19	Pusa Battery operated variable height platform	It is an eco-friendly, battery-powered platform with adjustable height and smooth movement, designed to boost efficiency and reduce fatigue in greenhouses and orchards.
20	Pusa Manohari	Pusa Manohari is a hybrid mango variety, known for its medium-sized, sweet, fiberless fruit with a greenish-yellow peel and red-tinged shoulders. It's ideal for medium-density planting and shows good resistance to mango malformation disease.
21	Pusa Mustard 28	Pusa Mustard 28 is a high-yielding mustard variety, known for its improved oil content, disease resistance, and adaptability to various growing conditions, making it beneficial for farmers in enhancing mustard production.
22	Pusa Samba-1853	Pusa Samba 1853 (IET 28014) is a near-isogenic line of the popular rice variety BPT 5204 (Samba Mahsuri), developed through marker-assisted selection to be resistant to bacterial blight and blast diseases, with a high yield potential and quality traits similar to its parent.
23	QPM 9	QPM 9 (Quality Protein Maize 9) is a biofortified maize variety developed to be rich in essential amino acids like lysine and tryptophan, which are typically lacking in regular maize. This makes it a valuable crop for improving protein quality and addressing nutritional deficiencies in human diets.

5. CORPORATE MEMBERSHIP

Corporate membership is a way through which we associate with industry to provide them member privileges related to single window clearance, early and quick seed lifting without licensing for established varieties and sharing of our regular information related to innovative technologies. In the last quarter, the Unit enrolled 10 new industry partners for membership and renewed the membership of 4 existing industry partners, resulting in a revenue generation of ₹ 71,500.

6. INCUBATION ACTIVITIES

6.1 UPJA & ARISE

On April 1, 2024, our UPJA & ARISE 2024 incubation programs were launched to support innovation and entrepreneurship in India's agri-startup ecosystem. This year, around 1,300 applications were received under both the programs. From May 27 to June 27, 2024, selected startups underwent a one-month training and mentoring phase. During this period, they received comprehensive support, including technical mentoring and validation, financial management, intellectual property management, industry connections, business mentoring, pilot opportunities, investment facilitation and guidance for building a sustainable business.



Following this training, the RAFTAAR Incubation Committee (RIC) meeting was held from July 4 to July 10, 2024, to select pre-seed and seed-stage startups for further rounds. Soon after that the Selection & Investment Committee (SIC) was conducted from July 22 to July 24, 2024, to make final recommendations for funding these startups. This year, 42 startups have been selected for the grant.

In August 2024, Pusa Krishi team started the startup due diligence process. They personally visited the offices and manufacturing units of all the selected startups across different regions of the country. During these visits, they observed the startups' operations, reviewed essential documents and assessed their overall readiness before providing funding.

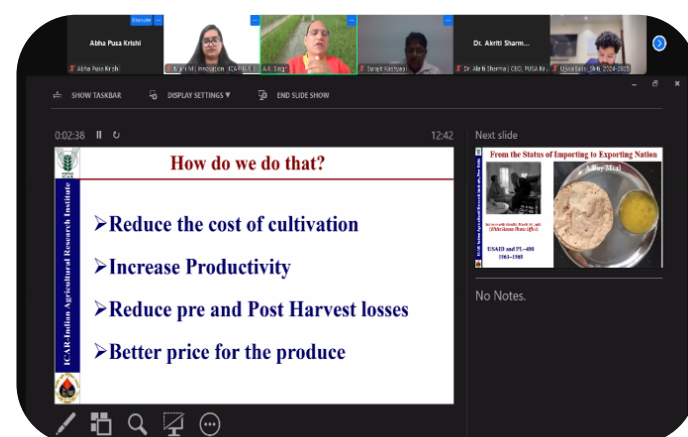
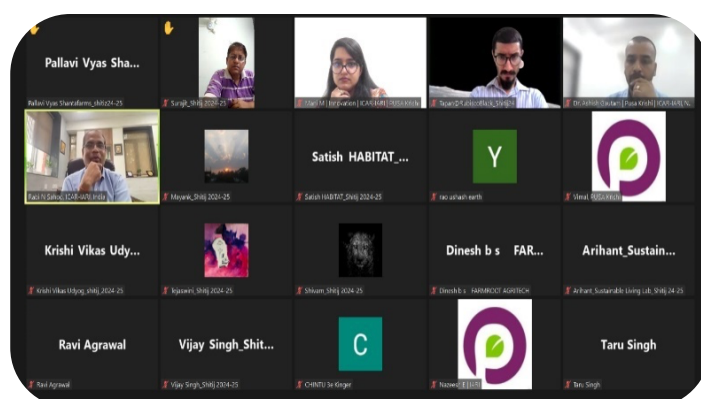


6.2 SHITIJ 2024

On July 20, 2024, SHITIJ 2024, an innovative year-long incubation program aimed at revolutionizing agriculture and boosting startup involvement in the sector, was launched with great enthusiasm. Out of 120 applicants, 30 promising startups were chosen for the intensive Phase 1 training. The evaluation of startups was held on 12th and 13th August 2024. The program kicked off with an inspiring Inaugural Session led by Dr. A.K. Singh, Former Director of IARI, who shed light on the current landscape of Indian agriculture.

The training, which began on August 20, featured a diverse range of sessions designed to meet the unique needs of agri-tech startups. Key discussions included the significance of tech briefs for the agriculture sector and insights into the ICAR repository for Knowledge Management. Day three focused on the Startup Ecosystem in Agriculture, alongside a primer on managing startup finances, scaling up and valuation.

In the subsequent weeks, the program delved deeper into crucial topics such as Design Thinking, Intellectual Property Rights and Business Edge. Attendees gained valuable insights on government schemes and registration processes for startups and MSMEs, as well as guidance on preparing effective pitch decks, tech



commercialization and marketing strategies, which significantly enriched their knowledge base. Additionally, expertise on startup funding was shared, along with discussions on the applications of Remote Sensing and GIS for startups. Through these comprehensive sessions, SHITIJ 2024 is shaping the future of agricultural innovation, equipping startups with the tools they need to thrive.

7. AGRIPRENEURSHIP DEVELOPMENT PROGRAMME (ADP)

Agripreneurship development programs (ADPs) play an important role in fostering innovation and sustainable practices within the agriculture sector. In the last three months four (4) ADPs were conducted on various subjects:

7.1 ADP on Innovative Processing Technologies and Functionalized Food Products

The ZTM & BPD Unit and Division of FS & PHT, ICAR-Indian Agricultural Research Institute, New Delhi conducted Agripreneurship Development Program (ADP) on 'Innovative processing technologies and functionalized food products' from 5th to 10th August 2024.

The objective of the training was to enhance the skill sets and knowledge of agripreneurs in processing techniques for developing functional foods as well as explain the importance of adhering to good manufacturing / handling practices, FSSAI regulations, quality assurance & standards, along with outlining procedures for obtaining required licenses and certifications. As many as 30 people participated in the programme.



7.2 ADP on Cultivation & Harvesting of Spirulina Biomass Towards Developing Value-added Product

Agripreneurship Development Program on cultivation and harvesting of Spirulina biomass towards developing value-added product was organized from August 12 to 14, 2024.

The objective of ADP was to train entrepreneurs, faculties, progressive farmers and students on cultivation, processing and formulation of value-added products from Spirulina biomass. The training also enhanced participants' marketing capabilities and enabled them to utilize natural resources sustainably, without compromising agricultural land and drinking water, which are depleting day by day.



7.3 ADP on Seed Production, Testing & Storage in Field & Vegetable Crops

The ZTM & BPD Unit, in collaboration with the Division of Seed Science & Technology at ICAR-IARI, Pusa conducted a training program on "Seed Production, Testing, and Storage in Field and Vegetable Crops" from September 9 to 13, 2024.

The program aimed to strengthen the skills and knowledge of officers, executives, and managers in quality seed production. Participants were introduced to various seed testing methods, both field-based and laboratory-based, to ensure seed quality assurance. The training also raised awareness about the opportunities and challenges related to seed certification and quality control, while providing insights into the post-harvest handling and management of seed lots.



7.4 ADP on Pusa STFR Meter for Developing Entrepreneurship in Soil Testing

The Agripreneurship Development Program on the Pusa STFR Meter for developing entrepreneurship in soil testing took place from September 23 to 27, 2024. The primary objective of the program was to foster entrepreneurship in soil testing and fertilizer recommendations while enhancing participants' skills in operating and handling the Pusa STFR Meter. Upon completion of the ADP, trainees gained hands-on experience in soil testing using both the Pusa STFR Meter and conventional methods. They also learned about proper handling and maintenance of laboratory equipment utilized in soil analysis, equipping them with valuable practical knowledge for their future endeavours in agripreneurship.



8. NAVIGATING SUCCESS: SUPPORTING STARTUPS IN THEIR JOURNEY

Myoho Food and Services Pvt. Ltd. recently signed a Memorandum of Agreement with PUSA Krishi, gaining access to its advanced Post-harvest lab facility to support research and development in food and agriculture. Meanwhile, Shhroomi Farms has successfully cultivated its first crop at the Pusa Krishi Laboratory, benefiting from the comprehensive support and expert guidance offered by PUSA Krishi. Together, these initiatives highlight PUSA Krishi's commitment to nurturing innovation and empowering startups in the agricultural sector.



9. OTHER ACTIVITIES

9.1 HOSTED AGRI UDAAN 7.0 (ROAD SHOW/START-UP HUNT) WITH ICAR-NAARM



Hosted AGRI UDAAN 7.0 (Road Show/Start-Up Hunt) with ICAR-NAARM α-IDEA, ICAR-NAARM, in collaboration with PUSA Krishi, ICAR-IARI, hosted Agri Udaan 7.0 (Road Show/Start-Up Hunt) on September 13, 2024, at Agricultural Engineering Auditorium, IARI, New Delhi. The event attracted over 80 distinguished participants, including innovative start-ups, industry experts, mentors, academic faculty and students, reflecting its broad appeal and relevance in agriculture. Agri Udaan is a specialized accelerator program tailored for startups in the food and agribusiness sector. The event featured a series of engaging talks delivered by esteemed dignitaries, investors and mentors.

9.2 Conducted Students Sensitization Program at PUSA Krishi

Pusa Krishi regularly hosts sensitization programs for startups, students and agri enthusiasts. On July 16, 2024, a group of students from DPS Raj Nagar Extension, New Delhi school visited its office to learn about various initiatives supporting emerging startups in agriculture. The interactive sessions offered insights into the integration of innovation in agriculture and the role of incubation centers in nurturing entrepreneurial talent.



10. NEWS & AWARDS



The U.S. Department of State honoured the remarkable 2023 Fortune–U.S. Department of State Global Women’s Mentoring Partnership mentees. Among these inspiring leaders was Ms. Aastha Singh, CEO of Bihar-based company Gramshree Agri Services Pvt. Ltd., who represented India on this prestigious international platform. Aastha, along with women leaders from around the world, is paving the way for the next generation of women professionals by breaking down barriers, promoting gender equity and empowering women to pursue their dreams in STEM, entrepreneurship and more.



Besides, Ms. Aastha was also included in the BW Disrupt elite 40 Under 40 list for 2024. This award is given to celebrate the success of trailblazing entrepreneurs from different fields for the development of the entire ecosystem.



JAIVIKALPA

Abhinav Pundir, Founder of Jaivikalpa Pvt Limited received the Best Entrepreneur Award at the Bharat’s AI & Drone Expo 2024 organized by CGC landran Mohali on 20th September 2024. The award was presented by Mr. Ashneer Grover, a true icon in the world of entrepreneurship.





Dr. Debtanu Barman, Founder, Aqua Doctors Solutions received an Appreciation Certificate from the Central Institute of Fisheries Education (ICAR-CIFE) on the occasion of National Fish Farmers Day celebration on July 10, 2024. This recognition acknowledges their contributions to the aqua industry and efforts in entrepreneurship development.



Advick AgVenture Pvt. Ltd. was recognized as the "Best AgriTech Startup of the Year 2024" at the prestigious India Startup Conclave Awards. This incredible achievement is a testament to the hard work, dedication and innovation of their entire team.



PhyFarm won the Tally Solutions Pvt Ltd MSME Honors 2024 in the "Tech Transformer" category. Their technology is making a significant impact on agriculture, enabling smarter and more sustainable farming practices.



Diviam Aahar won the Uttar Pradesh State Award at Bharat Entrepreneurship Summit in Delhi.



From the Editor's Desk



Dr. Akriti Sharma
CEO
Pusa Krishi, ICAR –IARI

Welcome to the latest edition of TAKSAY. I am delighted to share with our readers the impressive achievements of PUSA Krishi, IARI during the last quarter of 2024.

This quarter has been a remarkable period for PUSA Krishi, underscoring its pivotal role in driving agricultural innovation and entrepreneurship. A highlight was the prestigious Entrepreneurship Leadership Award that PUSA Krishi received at the UP-State Agriculture Conclave 2024. This honour not only highlights PUSA Krishi's dedication and hard work but also solidifies its reputation as a leading incubator for agri-startups, firmly committed to fostering innovation within the agricultural sector.

In a strategic move to bolster agri-tech innovations, PUSA Krishi signed a Memorandum of Understanding with Yamaha Motors Solutions India (YMSLI). This partnership aims to enhance startup incubation, market access and technological support, laying the groundwork for robust collaborations that benefit the agricultural ecosystem.

Moreover, significant advancements in technology commercialization were witnessed with 23 technologies developed by ICAR-IARI being successfully commercialized to 12 industry partners, generating revenue of ₹43.56 lakhs under the Lab to Land Initiative. This initiative is a testament to PUSA Krishi's commitment to translating research into real-world applications.

Our incubation programs, UPJA & ARISE, launched in April 2024, attracted around 1,300 applications, demonstrating the growing interest in agricultural entrepreneurship. Following a comprehensive training and mentoring phase, 42 startups and 4 student entrepreneurs were selected for grants. On the other hand, launch of SHITIJ 2024, an innovative year-long incubation program, further exemplifies PUSA Krishi's proactive approach to supporting agri-tech startups. Out of 120 applicants, 30 startups were chosen for intensive training, with sessions covering vital topics such as financing, marketing strategies and government schemes.

Our Agripreneurship Development Programs (ADPs) focused on innovative processing technologies, Spirulina cultivation, seed production and soil testing were successfully conducted, equipping participants with essential skills and knowledge to enhance their entrepreneurial capabilities.

Through these initiatives and collaborations, PUSA Krishi remains at the forefront of agricultural development in India, driving change and empowering the next generation of agripreneurs.

I would like to thank all our readers for their continued support. We look forward to bringing you more updates on our journey toward agricultural innovation!



Pusa Krishi, ZTM & BPD Unit, ICAR-IARI
ICAR- Indian Agricultural Research Institute,
New Delhi- 110012
011- 25843542; zonaltech@iari.res.in
<https://pusakrishi.in>

Associate Editors: Manisha Mani, Innovation Lead | Abha Toppo, Executive Officer – Content