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ZTM&BPD Unit, IARI won National IP Award, 2017



The Indian Intellectual Property Office confers National Intellectual Property (IP) Awards to outstanding innovators, organisations and companies in the fields of patents, designs, trademarks and geographical indications on the occasion of World IP Day every year.

'National IP - 2017 Award' was conferred to the ICAR-Indian Agricultural Research Institute, New Delhi on 27th April, 2017 in the category of 'Top R & D Institution/ Organization for Patents and Commercialization'. Dr. K V Prabhu, Joint Director (Research), IARI and Dr. Neeru Bhooshan, Incharge, ZTM & BPD Unit, IARI received the award from Hon'ble Smt. Nirmala Sitharaman, Minister of Commerce & Industry, Govt. of India

The ZTM & BPD Unit of ICAR-IARI under the leadership of Dr. Neeru Bhooshan during last 5 years guided by the Directorate of the Institute not only identified patentable inventions and filed patents and other IPR applications for ICAR-IARI and other ICAR Institutes in the North Zone and NAIP, but based on it, IP Portfolio and know how of commercial worth, successfully commercialized 196 technologies to 386 agro-based companies in last 5 years.

In the **LIME LIGHT** Entomopathogenic nematode-based *Galleria* cadavers for white grub management

ABOUT THE TECHNOLOGY

Entomopathogenic nematodes (EPN) are parasitic roundworms that infect and quickly kill insect pests that live underground. *Galleria mellonella* cadavers infected with EPN can be applied in sugarcane fields for managing the white grubs. The nematodes emerge from the cadavers in soil within 3-4 days to infect the grubs coming in their contact.

SALIENT FEATURES

- ⇨ Rearing *Galleria* is simple and cheap
- ⇨ Infecting *Galleria* with EPN takes 24 hours
- ⇨ Packaging and transporting cadavers easy
- ⇨ Cadavers applied in the field at 2-3 inches depth
- ⇨ Up to 2,50,000 EPN emerge from one cadaver
- ⇨ Have ability to search for insect pests
- ⇨ Kill the grubs within 48-96 hours and turn them red
- ⇨ Have potential to reproduce after application.
- ⇨ Safe to non-target organisms and the environment
- ⇨ Compatible with most agricultural chemicals

APPLICATION Applied in the field having good moisture. Excellent for soil-dwelling stages of many insect pests like white grubs, termite, root borers, cutworms etc.



Galleria Cadavers



Field Application



Live Grub Dead Grub



Dead Grubs Post-Application

Okra cv. Pusa Bhindi-5 (DOV-66)

- Resistant to Bhindi Yellow Vein Mosaic Virus
- Plants are straight having 2-3 branches, dark green stem and petioles with moderately lobed leaves.
- Pods are 10-12 cm long, attractive dark green colour with 5 ridges.
- Average pod yield 18.0 t/ha.
- Recommended for growing in summer and rainy season under north Indian condition.



Brinjal cv. Pusa Hybrid 20



- Released and notified for cultivation in Zone-IV (Sub-humid Sutlej-Ganga Alluvial Plains i.e., Punjab, Delhi, Uttar Pradesh and Bihar).
- Plants are non-spiny, semi-erect plant habit
- Light purple pigmentation partially present on younger leaves.
- Fruits are long, dark purple, glossy, weighing 90-100 g.
- Days to first picking at 55 days from transplanting.
- Average fruit yield is 53.2 t/ha.

Mustard Variety

- First Canola quality Indian mustard variety of India (Erucic acid <2% and Glucosinolates <30 ppm)
- Yellow seeded variety with 40.56% oil content
- Released for timely sown irrigated conditions of National Capital Region of Delhi including Delhi and adjoining areas in the states of Haryana, Rajasthan and UP
- Matures in 144 days
- Average Seed Yield is 2379 kg/ha
- Improved oil and seed meal quality makes this variety beneficial for farmers, traders and consumers



**Pusa Double
Zero Mustard
31 (PDZ-1)**



BG 3043 - a desi chickpea variety



For release in North Eastern Plains Zone – states of Bihar, Jharkhand, Bengal, Assam & Eastern Uttar Pradesh

- Early maturing (130 d duration) and therefore ideal for sustainability of the rice-based cropping systems of eastern Indian states
- Average yield is 1.6 t/ha and potential yield 2.5 t/ha
- 100-seeds weight is 21-22 g
- Moderately resistant to major pests (pod borer) and diseases (wilt, rot, blight, virus stunt and gray mold)
- Profusely branching with more number of pods per unit area



Three (3) new Patent applications filed with four (4) renewals of existing patents has been done, along with seven (7) responses to First Examination Report (FER), two (2) hearings and one (2) patents granted; One (1) Trade Mark application granted; PPVFRA application filed and Two (2) PPVFRA's registered; One (1) Copyright granted in August 2016; Four (4) NBA Form – III applications submitted and One (1) Form – II application submitted.

Patent Application Filed/ Granted

S. No.	Name of Innovation/Technology/Process	Application/ Registration No.	Date of Filing/ Grant
1	An Apparatus for in vivo Mass Production of Entomopathogenic Nematode	IN201711000736A	January 07, 2017
2	Digital Soil Test and Fertilizer Recommendation (STFR) Meter	PCT/IB2016/053174	May 30, 2016
3	A Process for Preparation of Polymer Encapsulated Nano-Sulfur Fungicide	1599/DEL/2011 IN277235A (Grant)	November 16, 2016
4	Process for the preparation of 5 substituted 1-3,4 oxadiazole – 2 thiols as new urease and nitrification inhibitors	IN279536A	January 27, 2017
5	Pusa Chickpea thresher	IN282047A	March 30, 2017
6	Improved Neem Larvicidal Compositions	IN282129A	March 30, 2017
7	A Slow or Controlled Release Mosquito Larvicidal Composition and a Process for Preparation Thereof	IN282133A	March 30, 2017

Trade Mark Granted

1	"flexiCFF"	2796885	August 11, 2016
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Application for Protection of Plant Variety Filed/ Grant

1	Pusa – Snowball K-25	REG/2016/668	June 2, 2016
2	Pusa – Hybrid – 20/ DBHL-20 (Brinjal)	274 of 2016	August 26, 2016
3	Pusa Prachi/ HI 1563 (Wheat)	236 of 2016	August 19, 2016

Copyright Granted

1	Decision Support System for Soil Health Assessment	8955/2016-COSW	August, 2016
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IP Spectra



IP Spectra an Intellectual Property Facilitation Centre (IPFC) for agro-based MSMEs has been established for providing IP facilitation to agro-based MSMEs with financial support of Ministries of MSME, GoI. The mission of IP Spectra is to create IPR awareness by providing IP services like Drafting and Filing Applications for Patent, Copyright, Trademark, Industrial Design, PPVFR; Pre-grant and Post-grant Services, hand-holding support towards technology commercialization, Advisory Services to agro start up & MSMEs.

IP Spectra **website** www.ipspectra.ztmbpd.iari.res.in was launched to reach the Agro start-ups and MSME. IP lecture series

were uploaded on the website along with IP acts and rules and required forms. These services can be availed by submitting online forms/offline forms available on the website.



- **ITMC meetings** – In the last Financial Year, four (4) Institute Technology Management Committee (ITMC) Meeting were organized by the unit under the chairmanship of competent authorities of ICAR-IARI. These meetings were organized to evaluate research outcomes of the technologies, management of IPR portfolios, make decisions on inventions that need to be protected by filing patents and to formulate the terms and conditions for commercialization of new and IPR enabled IARI technologies.

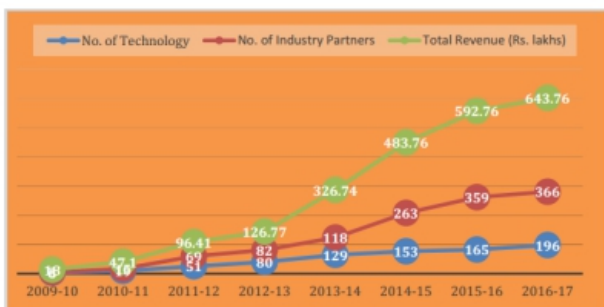


MoA signed with Dayal Fertilizers (P) Ltd, Meerut for VAM Bio-fertilizer Technology



MoA signed with GAPSHAM, New Delhi for STFR Meter Technology

Technology Commercialization



Technology commercialization from 2009 to 2017

During the financial year 2016-17, under Lab to Land Initiative, 34 innovative technologies of ICAR-IARI were transferred to 19 industry partners resulting in revenue generation of INR. Sixty One lakhs seventy four thousand (Rs. 61,74,000/-) only.

These innovative technologies included the vegetable varieties of IARI such as Beet- Detroit Dark Red (DDR), Brinjal- Pusa Anupam, Cauliflower- Pusa Sharad, Cauliflower- Pusa Snowball K-25, Carrot- Pusa Rudhira, Knoll khol -White Vienna, Lettuce- Great Lakes, Mustard- Pusa Sag, Okra A-4, Palak- Pusa Harit, Radish- Japanese White, Squash- Australian Green, Turnip- Purple Top White Globe (PTWG), Watermelon- Sugar Baby, Ridge gourd- Pusa Nutan, Sponge gourd- Pusa Sneha, Bottlegourd- Pusa Santushti, Bottlegourd- Sandesh, Bottlegourd- Pusa Samridhi, Bittergourd- Pusa Vishesh, Cowpea- Pusa Sukomal, Bathua- Pusa 1, Chilli- Pusa Sada Bahar Muskmelon- Pusa Madhuras, Onion- Pusa Riddhi, Pumpkin- Pusa Vikas, Amaranthus- Pusa Lal Chaulai. A vegetable basket of 27 vegetable varieties listed above was licensed to M/ Anyanya Seeds (P) Ltd.

Corporate Membership

To create a strong and meaningful relationship between the industry, society and farmers, ZTM & BPD Unit through the 'Corporate Membership' aims to maximize the spread of IARI technologies and its benefits which currently enrolled eighty three (83) new corporate members with seventy eight (78) renewals of existing memberships. This has created a total network of one hundred and sixty one (161) corporate members, generating a revenue of INR Seven lakhs eighty thousand (Rs.7,80,000/-) only.

The membership provides stakeholders an easy access to breeder seeds of all varieties released by the institute, priority in participation for events, Fairs, ADPs and workshops organized by the unit; Corporate members are also benefitted by the unit publications and receives timely notification regarding release of new technologies/varieties developed by IARI.

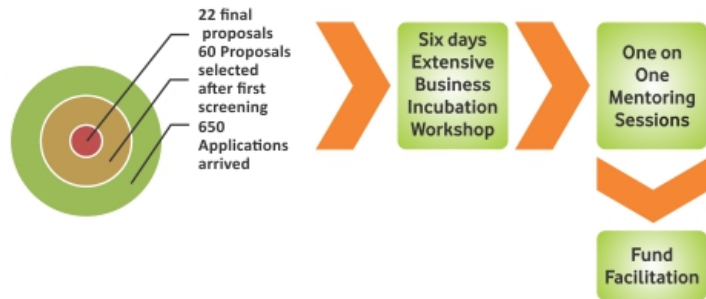
Arise 2016: Launchpad for Agri-Startups



To harness the entrepreneurial opportunities existing in Agriculture, ZTM & BPD Unit, ICAR-IARI had launched its incubation acceleration program 'Arise, Launch pad for Agri Start-ups' in June, 2016 in association with nine Agribusiness Incubation Centres of ICAR, two State Agricultural

Universities and four knowledge partners from the industry. It was an innovative and design-driven incubation acceleration initiative meant to identify young entrepreneurs/ideas at the initial phase itself with provisions of necessary skills / mentoring to form a proper business proposal and ultimately a viable business entity.

It was a seven-month long program in which 650 plus applications (online and offline both) had been received from different domains i.e., Post-Harvest and Food Processing, Agri Inputs, NRM, Farm Mechanization, ICT in Agriculture, Dairying and Livestock, Precision Farming, Sustainable Agriculture, Supply chain Management, Biotechnology and Agri Education.



• **First Screening:** Out of the 650 plus applications received, 60 business proposals had been selected after a rigorous evaluation from technical and business evaluators as per their specializations.



Selected Participants presenting Business Plan in Arise 2016

• **Selection Day:** These 60 potential participants presented their business plans in 'Arise' Selection Day Event in front of expert panels from various domains of Agriculture and allied sectors. 22 business proposals got selected in the mentioned event yielding a highly-diversified incubation portfolio.



• **Business Incubation Workshop:** For Arise participants, a business incubation workshop from September 18th to September 24th, 2016 was organized to equip them with the basics of business i.e., company formation, financial prepositions, marketing strategy, accounting, tax planning etc with a focus on their respective sector. They had been trained extensively on all these aspects with an emphasis on practical learning. The best speakers from industry, government and academia had been invited to interact with the participants.



Arise Business Incubation Workshop

- **One on One Mentoring Sessions:** To adhere with the objective of developing successful agri enterprises, special one-to-one mentoring sessions are being run in terms of milestone setting and timely review. The mentors for the program are scientists, entrepreneurs, investors, executives among others volunteering their expertise to help entrepreneurs through the tactical and strategic issues central to their businesses. Till date 60 mentoring programs have been organized for the incubatees.



Mentoring Sessions for incubatees

- **Evaluation Meet:** An Evaluation Meet was set up by the unit where the committee members reviewed the progress of the Arise participants and determined the course of action to be undertaken.

Arise workshop on 'Current funding opportunities for start-ups'

To familiarize with the funding ecosystem in government, a Panel discussion on 'Current funding Opportunities for Start-ups' was organized on March 01, 2017 for the incubatees and budding entrepreneurs. The speakers for the day comprised of eminent investors, domain experts and policy makers who have rich experience in the development sector in India. In the inaugural session, Dr. Sanjeev Saxena, ADG, introduced the theme and shared with the audience the objective of the roundtable. The various members of the panel provided valuable insights to the participants.



Dr. Neeru Bhooshan, I/c ZTM&BPD Unit welcoming Dr. Bindu Dey, Secretary, TDB

B2B Meetings

- During the Financial Year 2016-17, B2B meetings with 242 companies were organized by the unit which included participation from big players Mangalore Chemicals & Fertilizers Ltd., Adani Agri Fresh Ltd, India Glycols Limited etc to showcase the potential technologies of IARI.

- Team members of ZTM&BPD Unit participated in Krishi Mela 2016, Punjab organized in collaboration with M/s. Eco Inputs Pvt. Ltd. to showcase the prospective technologies of IARI to the farmers. The members interacted with the farmers and conducted the primary survey to assess the impact of the new IARI technologies/varieties specially Blue green Algae (BGA) and noted their valuable inputs.



Dr. Bhooshan distributing mementos during mela



Team ZTM & BPD Unit during Krishi Mela 2016

Agripreneurship Development Program (ADPs)

Three Agripreneurship Development Program (ADPs) were organized by ZTM&BPD Unit. The main purpose of ADP's was to nurture the talent of youth by enlightening them on various aspects of industrial activity required for setting up MSMEs.

(i) ADP on "Soil Fertility evaluation and nutrient management for enhancing Crop Productivity and Soil health": The two ADP were organized from 15-20 November 2016 and 21-26 November 2016 on special request from Samridhi team of Mahindra group for their employees. A total no. of 44 participants benefitted from the training. In the training, the participants learned about Soil sampling techniques, sample collection and processing, Determination of soil pH and EC, available Phosphorus, Boron, Sulphur, organic Carbon and Nitrogen availability, lime requirement of acid Soils, Interpretation of soil test data & report preparation, Determination of DTPA-micronutrients, Soil analysis on Pusa STFR Meter.

(ii) ADP on Plant tissue culture: Unit conducted a six day training on "Unlocking the Secrets to create a Successful Tissue Culture Enterprise" from November 28-December 03, 2016 for aspiring agripreneurs. With an objective to empower entrepreneurs on various aspects of plant tissue culture. The participants were provided insights on Basic requirements for a Low-cost tissue culture techniques, Practical on media preparation, sterilization,

inoculation, observations, encapsulation for artificial seeds etc, Virus indexing for micropropagated plants and Genetic fidelity analysis for tissue cultured plants and Company setup and secretarial and Regulatory compliance, Break. Participants also visited micropropagation park at TERI and Saver Biotech

Vegetable Field Day

To showcase and commercialize the promising Vegetable varieties and hybrids developed by IARI, a vegetable field was organized by ZTM&BPD Unit on February 15, 2017. The program was attended by breeders and marketing specialists of several seed companies like Syngenta India Limited, Nuziveedu Seeds Limited, Rallis India Limited, Rasi Seeds Pvt Ltd, Sakata Seeds Pvt Ltd, Dayal Seeds Pvt Ltd, Bejo Sheetal, Noble Seeds Pvt Ltd, Ananya Seeds Pvt Ltd etc. The seed company representatives visited the vegetable field and acknowledged the new varieties of institute. The delegates also interacted with the Dr. Tomar, Head, Division of vegetable Sciences and breeders of the institute and provided their valuable feedback on current market need of vegetable varieties and hybrids.

Dr Neeru Bhooshan, I/c ZTM&BPD Unit expressed her keen interest for collaboration with private companies through licensing mode to extend the reach of vegetable varieties/hybrids of IARI into farmers' field.



Glimpses of ADPs organized by ZTM&BPD Unit



Glimpses of Vegetable Field day

Awards & Recognition



Pusa Krishi Mobile App, to amplify the activities of the unit, was developed by ZTM&BPD Unit in collaboration with Department of Agriculture cooperation, Ministry of Agriculture was endowed with the **Award for recognition in the mBillionth Award 2016** organized by Digital Empowerment Foundation (DEF) at

Eros Hotel, New Delhi on July 23, 2016 for the category **Mobile For Business & Early Stage Projects**.

'Pusa Krishi' was launched to realize the mission of "Lab to Land" i.e. to disseminate real time information about IARI technologies to update its various stakeholders like farmers, industry, entrepreneurs and start ups.

The app has already been downloaded by about 30,000 individuals across the country.



Glimpses of mBillionth Award 2016

Appreciation from abroad

Delegation from MSU, USA:

Delegations from Michigan State University, USA visited ZTM & BPD to witness the modus operandi of the concept of Agri Business Planning & Development IARI, New Delhi. At the outset, Dr. Akriti Sharma, Scientist, ZTM&BPD Unit welcomed the members of the Michigan State University delegation and briefed them about the process, achievements and activities of the Unit.



Dr. Akriti Sharma, Scientist ZTM & BPD Unit with Michigan State University, USA Team

AGRI BUSINESS SOLUTIONS FOR BETTER WORLD



Editor's
DESK

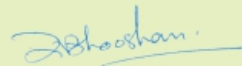
I am very happy to put the third edition of 'Taksay' in the hands of readers by apprising about the accomplishments and activities of ZTM & BPD Unit, ICAR-IARI.

This duration was full of enthusiasm and creativity as the Unit has taken up its incubation and acceleration activities under the banner of 'Arise' with flying colors. By contributing our bit in making the dream of 'Start-up India' a reality, several attempts had been made in a phased manner. Interactions with many entrepreneurs, understanding their needs, facilitate them with all the support had become an enjoying and cherishing activity at the unit.

We have also put our steps forward in the domain of IP facilitation by creating a full fledged IP Facilitation Centre and its website 'IP Spectra' to ease out the process of IP Filing and ensure timely delivery of the services.

We are striving towards excellence by making firm footsteps in the areas of technology commercialization, organizing Agripreneurship Development Programs (ADPs), Crop field days, organizing and participating in different fairs, exhibitions and seminars etc and wish to continue the same pace in future.

Stay reading!!!!!!



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