

Enabling New Generation Entrepreneurs

in Horticulture through Horti-Business Incubation

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Institute Technology Management Unit & Agri-Business Incubation centre located at ICAR-Indian Institute of Horticultural Research, Bengaluru is a facility of Indian Council of Agricultural Research (ICAR) created through National Agriculture Innovation Fund (NAIF) to commercialize the technologies of ICAR-IIHR by non-exclusive licensing, nurture horticulture technology based start-ups/ventures and horti-business consultancy through incubation. Technology developed for the benefit of farmers and other stakeholders will be successful when it is adopted by large number of growers. This is possible only when the technology is made available in adequate quantity with quality. The technologies developed by the research institutes was made available for farming community through commercialization and incubation of start-ups. Main objective of ITMU & ABI unit is to impart appropriate IP protection to the innovations, showcase, transfer, commercialize innovations from the ICAR-IIHR. The ITMU and ABI a unit of ICAR-IIHR, Bengaluru strives to be a bridge that links the research community with all the stakeholders of horticulture and business community. It attempts to promote horti-business ventures through technology development, dissemination and commercialization for everyone from corporate to individual farmer.

Key words: Crop Nutrition Technology, Farm Machinery, Plant Health Management

FOCUS AREAS OF ITMU & ABI

Seed & Planting Material

The improved varieties, hybrids having multiple disease resistance and high yield in crops like vegetables, fruits, medicinal and ornamental

crops have been developed by the institute. Lines with special traits like male sterility have also been made available. In the last ten years, institute has licensed these technologies to more than 73 seed companies.

Plant Health Management

Safe and cost effective plant health management technologies like bio-pesticides, micronutrients, botanical formulations, pheromone traps and bio fertilizers *etc.*, are offered to promote sustainable plant health management.

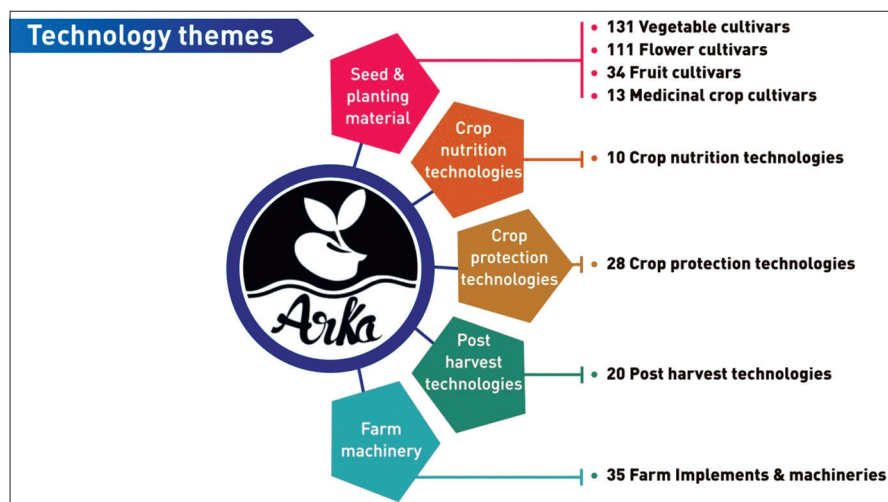
Post-Harvest Technologies

Processed products like fruit bar, osmotically dehydrated products, ready to serve (RTS) beverages, crushed tomato, squashes, wines, dry flower, mushroom products available are available for licensing.

Farm Machinery & Implements

The institute has developed various machineries and implements for facilitating farm mechanization, several designs for licensing viz.

- *Nursery Machinery:* Rooting Media



Mixing Cum Filling Machine - Automatic Dibbler Cum Vacuum Seeder

- *Sowing and transplanting:* Onion Drum Seeder - Broad Bed Former Cum Vegetable Seedling Transplanter
- *Fruit harvesters:* Mango, Sapota and Lime Harvester - Tractor Drawn Hydraulic Platform for Harvesting and Pruning
- *Mango processing:* Raw Mango Peeler, Slicer and Cube Cutter
- *Mushroom spawn production:* Motorized Grain Cleaner, Grain Boiler, Grain and Chalk Powder Mixer, Bag Filling Machine and Bulk Spawn Inoculators
- Fruit and Vegetable vending van
- Arka High Humidity Storage Box

Biotechnology

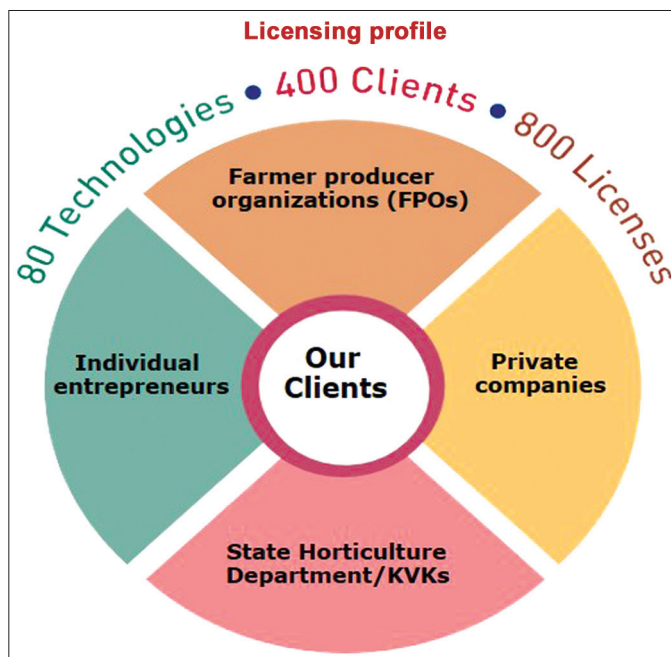
The division has developed technology for embryogenic cell suspensions for mass multiplication of banana (cv Elakki bale).

Incubation Models at ICAR-IIHR

The incubation facility provides handholding and capacity building support for entrepreneurs and start-ups in scaling up of technology based products from lab scale to commercial scale. ICAR-IIHR adopts a technology based incubation model of three pronged approaches of (i) On-site Incubation (ii) Off-site Incubation (iii) Specialized Incubation

On-site Incubation

Clients are provided technology up-scaling facilities inclusive of infrastructure, space and other technical inputs. This facility enables the start-ups for maximizing their profit. Under this mode of incubation, technology innovator works in close collaboration with the client for scaling up the business processes. The incubatee is also permitted to sell product through marketing network of the institute



Incubation model operation at ICAR-IIHR

and assist the client to get better market access.

Off-site Incubation

In this mode of incubation, the client enters into MOU and obtains license for technology and take up production in own facility. If any technical guidance is required by the client during the production, the innovator will visit the client's site and provide the requisite advice and direction.

Specialised Incubation

The institute also has facility for providing consultancy services in specialized areas as required by clients. Under the specialized

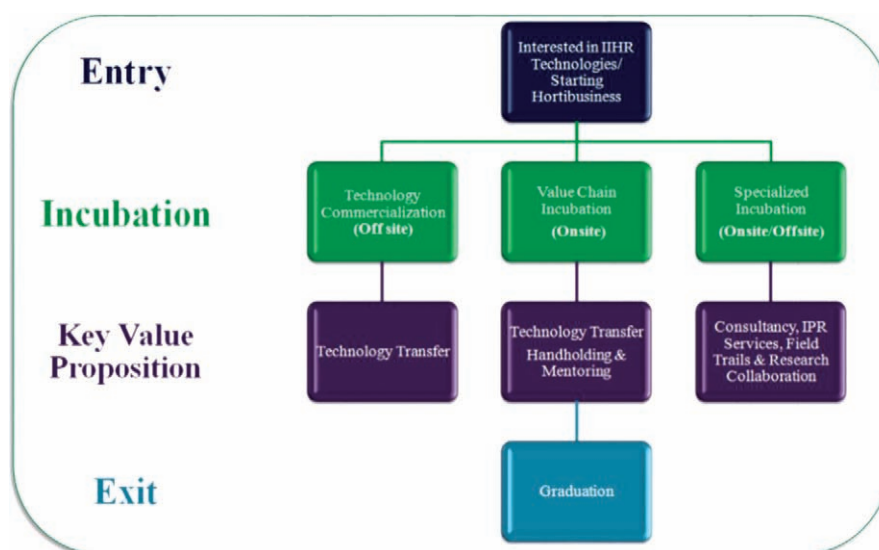
incubation mode there is provision for research collaboration, concept testing, new product development, product enhancement, paid up trials.

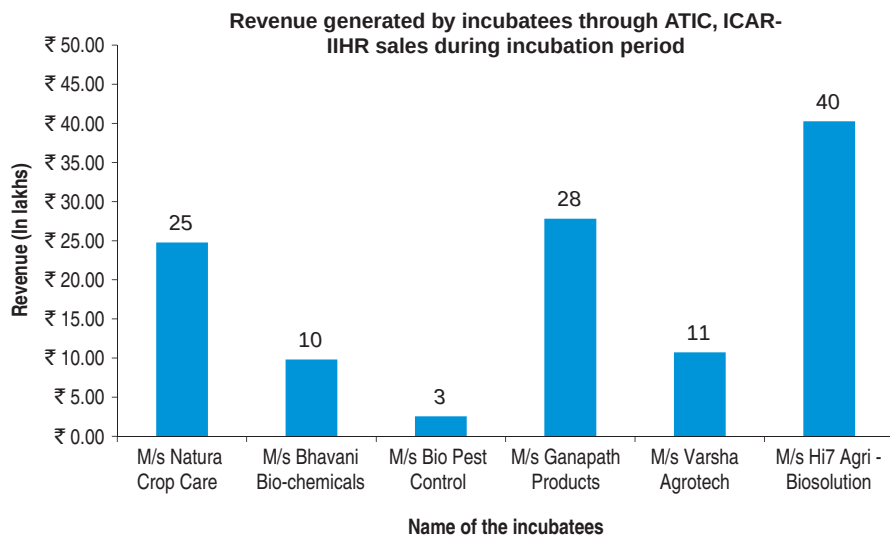
Success stories of incubatees graduated from ABI

M/s Natura Crop Care, Doddaballapur

Mr Manoj Kumar, M. Tech graduate while working at ICAR-Indian Institute of Horticultural Research, Bengaluru as research fellow, realized the potential of ICAR-IIHR developed technologies and the provision for thier commercialization. He started initially with licensing of Arka Microbial Consortium (solid and liquid formulations) during 2016 and gradually he obtained licenses for number of products over the years, at present he has licensed over seven ICAR-IIHR technologies i.e., Neem Soap, Pongamia Soap, Citrus Special, Actino-plus, Decomposer and Pheromone trap. He has created an employment opportunity for 20 people, with a turnover of around 4.5 crore per year and is serving over 40,000 farmers across six states.

The firm has been recognized at international, nation and state level by receiving award and recognitions. Best Innovation award in sustainable





institute developed interest in commercialization and incubation. Initially he started the firm with licensing of banana special then went on to license mango special and vegetable special to his company. Now he has created employment opportunity to 10 employees and currently has production capacity of 30 tonnes per month with a turnover of around 1.5 crore per year.

M/s Krishi Biosys, Doddaballapur

Mr. Srinivas, being an entrepreneur came to know about the commercialization of our technologies through ICAR-IIHR website. He has licensed biopesticide technologies i.e., *Trichoderma viride*, *Trichoderma harzianum*, *Pseudomonas fluorescens*, *Verticillium chlamydosporia* and *Paecilomyces lilacinus* during 2012. Presently, with the support of 10 people he is producing around 40

crop protection from Global Forum for innovations in Agriculture from Ministry of Food and Agriculture, Abu Dhabi held in Abu Dhabi during April 2019. BIRAC BIG Award for innovative idea of organic formulation from Department of Biotechnology during 2019. Elevate Karnataka Award during 2019 from Karnataka Start-up Cell and department of ITBT, Government of Karnataka. M/s Natura Crop Care has been selected as one of top 5 Indian

Agri-tech Start-ups and appointed for delegation at Indo Brazil Agri-tech cross border program (Dec 2019).

M/s Hi7 Agri Bio Solutions, Bengaluru

Mr. Gavaskar, B. Tech graduate from Andhra Pradesh, while working at the



Indian Farming family

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a wonderful, joyful, healthy, wealthy &
prosperous New Year 2020*



tonnes of biopesticides per month with a turnover of around 4.0 crore per year.

M/s Leaf Box, Bengaluru

An innovative entrepreneur came with a design of leaf box- a natural air purifier and ICAR-IIHR provided validation and technical support including specific list of plants that are suitable for indoor cultivation and purifying the air. This unique product improves aesthetic value and has completely automated water supply system.

Sidda Halasu

S.S. Paramesha of Chelur village in Tumakuru district of Karnataka had a jackfruit tree with a unique deep coppery red flakes that are not only tasty but also have high nutritive value. S.S. Paramesha observed huge demand for the fruits from this tree. He planned to multiply planting material and ICAR-Indian Institute



of Horticultural Research supported the farmer by signing a MoU to multiply Siddi halasu planting material through grafting. Under the MoU 75% of the proceeds goes to the farmer.

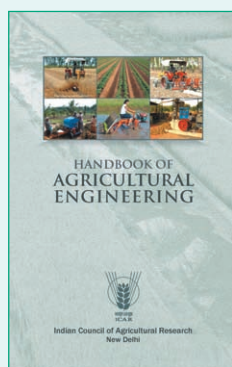
Conclusion

The Technology Management Unit & Agri-Business Incubation centre has made good progress in the last 5 years with regard to technology commercialization and had commercialized 80 technologies

during this period. Number of technologies have been protected, patents filed and licensed for mass production under different theme areas. Agri-Business Incubation centre at ICAR-IIHR, started its operations since May 2013 and successfully initiated the processes of incubation and business process development. The ABI centre has a total enrolment of 10 onsite, 18 offsite and two specialised incubatees over the years. The ABI organized 15 Entrepreneurship Development Programmes (EDPs), business mentoring and awareness campaigns for enthusiastic hortipreneurs and research scientists, facilitated research collaborations, patent search facilitation, patent filing and has several success stories to highlight and share.

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HANDBOOK OF AGRICULTURAL ENGINEERING



Agricultural Engineering interventions have led to significant improvement in agricultural productivity by timeliness of operations, reduction in drudgery, prevention of post-harvest losses and achieving higher cultivation intensity. Timely farm operations with efficient use of inputs, post-harvest processing and value addition to agricultural produce and conservation and sustainable use of natural resources are essential for ensuring higher returns to the cultivators. This is the maiden attempt of the Indian Council of Agricultural Research to publish the *Handbook of Agricultural Engineering*. The handbook comprises 50 chapters under four sections, namely Farm Machinery and Power, Soil and Water Engineering, Energy in Agriculture and Agro-Process Engineering. This publication would be useful to farmers, students, researchers, extension workers, policy makers, entrepreneurs and other stakeholders.

TECHNICAL SPECIFICATIONS

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