

## ITMU, Technology licensing issued from December 2022 to June 2023 (till 12.6.2023)

### December 2022

1. **Arka Sasya Poshak Ras- A liquid nutrient formulation for soilless cultivation.** This nutrient solution is useful for cultivating different vegetables at terrace gardens, vertical farms, kitchen gardens and also at the commercial level using soilless media. Dr. Kalaivanan D., Scientist, Division of Natural Resources is the scientist I/c for the Arka Sasya Poshak Ras technology. In December 2022, the technology was licensed to M/s. Earth First Solutions LLP, Bengaluru on 15.12.2022 and the license fee paid was Rs. One lakh +18% GST.



2. **Solar Power Integrated Outdoor Mushroom Growing Unit;** useful for growing mushroom at home. The scientist I/c for this Agricultural Engineering machinery Drawings is Dr. G. Senthil Kumaran, Principal Scientist, Div. of PHT and Agril. Engg.. The technology was licensed to Khan General Engineering Works, Mysuru on 13.12.2022. License fee paid was Rs. 25,000/- + 18% GST.



3. ICAR-IIHR Biopesticide technologies, *Trichoderma viride* 1.5% W. P. and *Pseudomonas fluorescens* 1% W. P were licensed to Meristem Biotech, Bengaluru on 29.11.2022. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh per technology along with the applicable GST of 18%. ICAR-IIHR Biopesticide technologies are eco-friendly technologies for sustainable

management of nematodes. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

4. **Arka Minimally Processed Onion** technology for increasing shelf life of onion upto 12 days on storage at 8 degree Celsius was licensed to M/s. Srikissan, Bangaluru. Minimally processed onion is 100 per cent usable and packed ready-to-cook product maintaining flavour and freshness and offering convenience to the end user in preparation of culinary recipes. Dr. Bhuvaneshwari S., Principal Scientist from Div. of PHT and Agril. Engg. is the scientist in charge. The MoU was exchanged on 22.12.2022 at ICAR-IIHR and the fee paid was Rs. 5000/- + GST@18%.



## January 2023

1. **Arka Sasya Poshak Ras**- A liquid nutrient formulation for soilless cultivation. This nutrient solution may be used for cultivating different vegetables at terrace gardens, vertical farms, kitchen gardens and also at the commercial level using soilless media. Dr. Kalaivanan D., Scientist, Division of Natural Resources is the scientist I/c for the Arka Sasya Poshak Ras technology. In January 2023, the technology was again licensed to M/s. Ecophytocare India Pvt. Ltd. , Mysuru on 12.01.2023 and the license fee paid was Rs. One lakh +18% GST.



2. **Arka Floral Agarbatti and Dhoop**, the technology was first time licensed on 13.01.2023 to Craftizen Foundation, Bengaluru. Dr. Smitha G. R., Scientist Division of Flower and Medicinal Crops is the scientist I/c. License fee paid is Rs. 30,000/- + 18% GST. The floral incense sticks developed are plant based, biodegradable and eco-friendly. It can be prepared both from individual flower wastes and with the mixture of floral wastes. Burning duration of floral incense sticks was 20 and 10 minutes more compared to charcoal and Phool (Flower waste based incense stick commercial brand) incense sticks, respectively.



3. **Solar Power Integrated Outdoor Mushroom Growing Unit**; useful for growing mushroom at home. The scientist I/c for this Agricultural Engineering machinery Drawings is Dr. G. Senthil Kumaran, Principal Scientist, Div. of PHT and Agril. Engg.. The technology was licensed to Chamundeswari Traders, Mysuru on 06.01.2023. License fee paid was Rs. 25,000/- + 18% GST.



4. **Arka Vegetable Special and Neem Seed Powder Pellet** technologies were licensed to AG Organics, Bengaluru on 06.01.2023. A total license fee of 5.5 lakhs + 99,000 (GST 18%) was received at Agrinnovate India Ltd. towards licensing of both these technologies. Micronutrients availability to vegetable crops is a limiting factor, as a result the yield levels of is affected. This is severe on alkaline, saline, water logged and acidic soils of India. Application of micronutrients to soils will result in fixation of applied nutrients and the repeated application of micronutrients may result in build up of micronutrients reaching the toxicity levels in soil. The utilization efficiency of applied micronutrients to soil may not be beyond 5 percent thus resulting in fixation of 95 percent or more in soil. Hence supplementing

micronutrients through foliar sprays is better option wherein the utilization efficiency is beyond 90 percent and wastage of nutrients through fixation is also minimum. Dr. G. C. Satisha, Principal Scientist, Division of Natural Resources is the scientist in charge of Arka Vegetable Special technology.

Neem seed powder extract is found to be effective against many insect pests of vegetable crops. However, the main limitation for using neem seed powder is that the process involved in its use is cumbersome and time-consuming. The neem seed powder extract is highly unstable, hence to be utilized in a very short period. Hence, ready to use commercial formulation of neem seed powder is need of the hour. Neem seed powder blended with polymers/carriers/dispersants is being incorporated to bring out a ready to use form as Arka Neem Seed Powder Pellet. It is very efficient in management of Diamond Back Moth and aphids in cabbage and cauliflower. Dr. Prasanna Kumar N. R., Scientist, Division of Crop Protection is the I/c. Scientist for this technology.



**5. Arka High Humidity Storage Box** technology was licensed to Ranjeeta's Agri Foods Health and Hygiene Pvt. Ltd., Odisha on 17-01-2023. The fee paid was Rs. 15000/- + GST@18%. Leafy Vegetables are highly perishable in nature which requires high humidity to retain freshness. In order to retain freshness, most of the push cart and retail vegetable vendors cover the leafy vegetables with wet gunny cloth and sprinkle water to maintain high RH .The process may cause the spoilage of the produce due to condensation of water. To overcome these problem and to store green leafy vegetables in hygienic way, Arka High Humidity Storage Box was developed which will retain the freshness and shelf life of leafy vegetables by 36-48h at ambient condition. Dr. Bhuvaneshwari S., Principal Scientist from Div. of PHT and Agril. Engg. is the scientist in charge.

February 2023

1. Bottle Gourd  
BG-114-3 and



GSB resistant lines BG95,  
BG-114- were licensed to

Leadbeter Seeds Pvt. Ltd., Mumbai, Maharashtra on 14. 02.2023. Total license fee of Rs. 9,00,000 + Rs.1,62,000/- as 18% GST was received at Agrinnovate. Dr. M.V. Dhananjaya, Principal Scientist, Division of Vegetable Crops is the Innovator of these technologies. Powdery mildew resistant line BG-6-3(Elongated straight), Powdery mildew resistant line BG-6-3(Elongated straight) and Powdery mildew resistant line BG-8-1 (Elongated straight with stripes). They can be used as donor parent in hybridization to develop resistant varieties, can be used as rootstock for other cucurbits. Cost effective reducing 50-60% of dependence on pesticides.



2. Nutrient Crop Care Pvt. Ltd., Odisha had licensed Arka Microbial Consortium (Solid & liquid formulations) and Arka Vegetable Special on 21.2.2023. Total fee of Rs. 9 Lakh + Rs. 1,62,000/- as 18% GST was received at Agrinnovate.

Arka Microbial Consortium (AMC) (Solid + liquid), carrier based or liquid microbial product containing N fixing, Zn solubilizing, K mobilizing and plant growth promoting microbes which is widely used as a bio-fertilizer through seed, soil, cocopeat or as a foliar spray. AMC has a

shelf life of six months at room temperature. It increases yield by 10-15% and reduces N & P fertilizer use by 25%. Dr. G. Selvakumar, Principal Scientist, Division of Natural Resources is the scientist in charge of Arka Microbial Consortium technology.

Micronutrients availability to vegetable crops is a limiting factor, as a result the yield levels of is affected. This is severe on alkaline, saline, water logged and acidic soils of India. Application of micronutrients to soils will result in fixation of applied nutrients and the repeated application of micronutrients may result in build up of micronutrients reaching the toxicity levels in soil. The utilization efficiency of applied micronutrients to soil may not be beyond five percent thus resulting in fixation of 95 percent or more in soil. Hence supplementing micronutrients through foliar sprays is better option wherein the utilization efficiency is beyond 90 percent and wastage of nutrients through fixation is also minimum. Dr. G. C. Satisha, Principal Scientist, Division of Natural Resources is the scientist in charge of Arka Vegetable Special technology.



3. Arka Vegetable Special technology was licensed by Arekal Organics and Bio Fertilizers Pvt. Ltd ., Bengaluru on 21.2.2023. The license fee of Rs. 4 Lakh + Rs. 72,000/- as 18% GST was received at Agrinnovate. Micronutrients availability to vegetable crops is a limiting factor, as a result the yield levels of is affected. This is severe on alkaline, saline, water logged and acidic soils of India. Application of micronutrients to soils will result in fixation of applied nutrients and the repeated application of micronutrients may result in build up of micronutrients reaching the toxicity levels in soil. The utilization efficiency of applied micronutrients to soil may not be beyond five percent thus resulting in fixation of 95 percent or more in soil. Hence supplementing micronutrients through foliar sprays is better option wherein the utilization

efficiency is beyond 90 percent and wastage of nutrients through fixation is also minimum. Dr. G. C. Satisha, Principal Scientist, Division of Natural Resources is the scientist in charge of Arka Vegetable Special technology.



4. **Arka Minimally Processed Onion** technology for increasing shelf life of onion upto 12 days on storage at 8 degree Celsius was licensed to M/s. Sivabharathi Farms, Coimbatore, Tamil Nadu. Minimally processed onion is 100 per cent usable and packed ready-to-cook product maintaining flavour and freshness and offering convenience to the end user in preparation of culinary recipes. Dr. Bhuvaneshwari S., Principal Scientist from Div. of PHT and Agril. Engg. is the scientist in charge. The MoU was exchanged on 20.2.2023 at ICAR-IIHR and the fee paid was Rs. 5000/- + GST@18%.



5. **Mushroom Fortified Rasam Powder, Arka mushroom chutney powder (all 7 types), Arka mushroom Nutri-Cereal cookies (all 5 types)** was licensed to Action Aid Association, Bengaluru on 13.2.2023. Total amount paid was Rs. 48,600/- (License fee (Rs. 45,000/-) + 10% TDS deducted from license fee only Rs. 4500/- +Rs. 8100/- as 18% GST. Dr. Chandrashekara C., Scientist, Mushroom Laboratory, Division of Crop Protection is the Scientist I/c for these technologies.

The Arka mushroom millet cookies technology relates to the usage of dry Elm oyster mushroom (*Hypsizygus ulmarius*) powder in combination with five different millet flours (sorghum or jowar or *sorghum vulgare*, pearl millet or bajra or *Pennisetum glaucum*, corn or maize or *Zea mays*, finger millet or ragi or *Eleusine coracana* and little millet or sawai or *Panicum sumatrense*) for the production of mushroom millet cookies. Both mushrooms and millets are well known for their culinary medicinal properties. Mushrooms are novel horticultural crop gaining importance. Mushrooms are a very good source of protein, fibre, iron, vitamin B & D, potassium, phosphorus, Selenium and copper. They also contain polysaccharides and antioxidant ergothioneine which are immune stimulators and anti-cancer agents. Mushrooms are extremely good for diabetics and heart patients due to their low energy, very low fat, no sugar, ability to reduce cholesterol and triglycerides. Millets are once again regaining their importance as a staple source of food due to their varied nutritional potential. Blended or combination food or food products can be an important way to diversify the food plate and obtain balanced nutrition as well. Development of mushroom millet cookies is a step towards blending the nutritional goodness of mushrooms and millets for better taste and nutrition. This technology can also help in the development of entrepreneurship through the production of these products.

The Arka Mushroom chutney powder technology relates to the usage of dry oyster mushroom for the production of seven types of mushroom chutney powders which can be used for the nutrition enhancement of daily household diet both at rural and urban levels. Although mushrooms are very well known for their culinary medicinal properties, their consumption has been limited due to short shelf life, irregular availability and high cost. People are not aware about the usage of dry mushrooms and the ways in which mushrooms can be fortified in everyday diet to enhance its flavour and nutrition. The seven variants of Arka mushroom chutney powder combines the traditional taste and nutritive goodness of mushrooms with traditional healing herbs like Brahmi, Moringa leaves and traditional nutritive seeds like flax seeds, sesame seeds, ground nut and coconut. It is a novel product to be consumed daily as a daily food accompaniment with any traditional Indian food. It is a ready to eat powder and can be easily adopted in mid day meals and defense food. It has a shelf life of three months in airtight containers/pouches at ambient temperature (26-28°C) which can be extended at lower temperature. It can be taken up as entrepreneurship by women SHGs, war widows, disabled soldiers and other rehabilitation programs. Hence this technology will be of immense



importance to enhance nutrition if adopted under nutrition programs and also help in income enhancement of rural women, war widows, and disabled people.



**6. Arka Shubra**, Mucuna variety is a pedigree selection is a white seeded line with high seed yield (4.5 to 5.5 t/ha under support, 2.25 to 2.75 t/ha under surface cultivation), high L dopa content & yield (5.43%; 269.67 kg/ha) with non irritant trichomes on pods. It matures in 180-190 days. Arka Shubra was licensed to Ecophytocare India Pvt. Ltd., Mysuru, Karnataka on 23.02.2023 and the license fee collected was License fee: Rs. 10,000/- + 18% GST.



**7. Arka Mango Special** technology was licensed by AIRR Organics and Biofertilizers Private Limited, Bengaluru on 10.2.2023. The license fee of Rs. 03 Lakh + Rs. 54,000/- as 18% GST was received at Agrinnovate. Micronutrient (Arka IIHR Mango Special) formulation for mango as foliar application is recommended for all mango cultivars grown across the states on all types of soils. The dosage of this micronutrient formulation for mango is recommended at 5 grams per litre of water along with 0.5 ml of shampoo (or sticker /gum - any make). This micronutrient formulation mixture is recommended for

bearing trees (Above 5 years) twice a year as foliar application. The first foliar spray is recommended between the months of October to November (before two months of flowering) and the second spray is recommended when fruits attain lime size (March-April). For each spray, farmers need 1.00 kg of the product for 200 litres of water for bearing trees between 5 to 10 years of age. Similarly for trees between 10 to 20 years of age, 2.0 kg product is required for 400 litres spray solution. For trees more than 20 years, 600 litres of water is required, 3 kg product is recommended. Dr. G. C. Satisha, Principal Scientist, Division of Natural Resources is the scientist in charge of the technology.



**8. Solar power operated tricycle cart for fresh fruits and vegetable vending** machinery drawings were licensed by Kerala Agro Machinery Corporation Limited, Kerala on 15.2.2023. License fee paid was Rs. 25,000 +GST @18%. The scientist I/c for this Agricultural Engineering machinery Drawings is Dr. G. Senthil Kumaran, Principal Scientist, Div. of PHT and Agril. Engg.. The machine maintains freshness of the fruits and vegetables and is useful for vending. It has a capacity of 80-100 Kg.



9. **Arka Suprabhath**, a new Mango hybrid namely H-14 was identified by VTIC of the Institute. H- 14 is a double cross hybrid between Amrapali (Dashehari x Neelum) X Arka Anmol ( Alphonso x Janardhan Pasand). It is a medium vigorous, regular and bunch bearing, high yielding (35-40kg /plant after 4 years of planting), fruit weight ranged from 250-300g, fruit shape is like Alphonso and has pulp colour of Amrapali, deep orange firm pulp, pulp recovery (>70%), TSS(>22°B), acidity (0.12%), carotenoids (6 mg/100g FW) and flavonoids (3.44 mg/100g FW) and it has got the shelf life of 8-10 days at room temperature. This hybrid was developed by Dr. M. Sankaran, Dr. M.R. Dinesh, and Dr. C. Vasugi, Division of Fruit Crops, ICAR-IIHR, Hesaraghatta, Bengaluru-560089.

Mango Variety - Arka Suprabhath was licensed to Devbhoomi Enterprises, Dehradun, Uttarakhand on 25.2.2023. License fee: Rs. 75,000/- + 18% GST



## March 2023

1. **ICAR-IIHR Biopesticide technologies** are eco-friendly technologies for sustainable management of nematodes. **IIHR** *Trichoderma Trichoderma harzianum*1% W. P. was licensed to KVK Kheda, Gujarat on 08.03.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

2. Eco Naturals, Hyderabad, Telangana licensed **Arka Floral Agarbathi and Dhoop** on 10.3.2023. Dr. Smitha G. R., Scientist Division of Flower and Medicinal Crops is the scientist I/c. License fee paid is

Rs. 30,000/- + 18% GST. The floral incense sticks developed are plant based, biodegradable and eco-friendly. It can be prepared both from individual flower wastes and with the mixture of floral wastes. Burning duration of floral incense sticks was 20 and 10 minutes more compared to charcoal and Phool (Flower waste based incense stick commercial brand) incense sticks, respectively.



3. Srilakshmi Enterprises, Medchal, Telangana licensed **Arka Floral Agarbathi and Dhoop** on 10.3.2023. Dr. Smitha G. R., Scientist Division of Flower and Medicinal Crops is the scientist I/c. License fee paid is Rs. 30,000/- + 18% GST. The floral incense sticks developed are plant based, biodegradable and eco-friendly. It can be prepared both from individual flower wastes and with the mixture of floral wastes. Burning duration of floral incense sticks was 20 and 10 minutes more compared to charcoal and Phool (Flower waste based incense stick commercial brand) incense sticks, respectively.



4. Go Green Bio Plants had licensed **Arka Asawa** Gerbera on 24.3.2023. Dr. Aswath C., Retd. Principal Scientist, Division of Flower and Medicinal Crops is the innovator of the technology. License fee paid is Rs.50,000/- + 18% GST. The MoU was exchanged in absentia upon the request of the client.

5. Dharma Technologies, Tumkuru, Karnataka licensed machinery drawings for **Root media sieving and bag filling unit, Rooting media mixer cum bag filling machine** which has a capacity of 1000 bags/h and **Protray dibbler cum vacuum seeder** (Dibbles and sows vegetable seeds in the growing media filled portrays, capacity 60 trays/h) on 24.3.2023 in absentia. The scientist I/c for this Agricultural Engineering machinery Drawings is Dr. G. Senthil Kumaran, Principal Scientist, Div. of PHT and Agril. Engg.. License fee paid is Rs. 5000/- + Rs. 5000/- + Rs. 5000/- + GST @18%.

6. **Arka Savi Rose variety** was licensed by Thara Rose Nursery, Andhra Pradesh on 30.3.2023. License fee: Rs. 50,000/- + 18% GST: Rs. 9000/- Arka Savi, flowers are Purple Red in colour and are produced in bunches, flowers are cut with pedicel i.e, loose flowers, potential yield of loose flowers expected is 30 tons/acre/year. In addition to high yield, it has added advantage of long shelf life of 5-6 days. Dr. Tejaswini P., Principal Scientist, Division of Flower and Medicinal Crops is the innovator.



## April 2023

1. **ICAR-IIHR Biopesticide technologies** are eco-friendly technologies for sustainable management of nematodes. **IIHR *Trichoderma viride* 1.5% W. P.** was licensed to M/s. Avadh sugar & Energy Ltd., Uttar Pradesh on 03.04.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

2. Shreya Enterprises, Madhya Pradesh licensed **IIHR *Trichoderma viride* 1.5% W. P.** on 24.04.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. **ICAR-IIHR Biopesticide technologies** are eco-friendly technologies for sustainable management of nematodes. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

3. **Arka Crushed Tomato Technology** was licensed to Yetram Farmer Producer Company Limited, Krishnagiri Dist., Tamil Nadu on 10.04.2023. Total amount paid is Rs. 49560/- (License fee (Rs.40,000/-) + Technology Demonstration fee Rs. 2000/- + 18% GST). Dr. Bhuvaneshwari S., Principal Scientist from Div. of PHT and Agril. Engg. is the scientist in charge. The final ready to use product has good colour and consistency, and peel as well as seeds are retained.



4. **Mango Fruit Bar** technology was licensed to Dewbati Enterprises, Bihar on 17.04.2023 (License fee Rs.50,000/- + Technology Demonstration fee Rs.5000/- + 18% GST). Osmotic dehydration technology developed by ICAR-IIHR helps in preparation of dehydrated products which are comparable to fresh fruits and vegetables for colour, taste and flavour. Such products have a shelf life of six months to one year under ambient conditions. Dr. R. B. Tiwari, Principal Scientist, Division of Social Sciences is the innovator of the technology.



5. **Embryogenic cell suspensions for mass multiplication of Banana (cv Elakki balle)** was licensed to Vaishnavi Biotech, Bengaluru on 27.04.2023. Dr. Usha Rani T. R., Senior Scientist, Division of Basic Sciences is the I/c Scientist for the technology. License fee is Rs.50,000/- + 18% GST). Highlights of the technology are:

- ❖ Immature male flowers are used hence sterilization can be minimized/avoided
- ❖ Labour cost can be reduced as shaker is preferred for multiplication
- ❖ Saving 25% (Cost per plant is reduced by Rs 5)



6. Sashanka Agro Tech Private Limited had licensed **Gerbera Arka Asawa** 28.04.2023. Dr. Aswath C., Retd. Principal Scientist, Division of Flower and Medicinal Crops is the innovator of the technology. Total amount Rs. 35400/- License fee (Rs.30,000/-) + Rs. 5400/- as 18% GST.



7. Ecomknow Agro Products Private Ltd. had licensed **Arka Vertical Garden Model** drawings on 28.4.2023. License fee paid was Rs. 5000 + 18% GST. Dr. Carolina Rathina Kumari, Principal Scientist from Div. of PHT and Agril. Engg. is the innovator scientist. The vertical garden structure has three major sub structures viz., i) base frame, ii) main central support and iii) supports for pots/grow bags Main centre support is a square tube anchored to the base frame with necessary supports. Pot holders for pots/grow bags are fabricated suitable for different pot sizes and shapes and fitted at four different height levels. Heavy duty nylon swivel wheels are fitted at the bottom of the base frame for the mobility of the vertical garden structure. The wheels are useful to orient the structure in the desired direction to ensure falling of uniform sunlight on every pots.



8. **Rose variety, Arka Savi and Arka Parimala, and Marigold variety Arka Bangara 2** were licensed by Darjeeling Gardens Pvt. Ltd. on 27.4.2023. Total amount paid towards licensing is Rs. 118000/- {License fee (Rs.50,000/- +Rs. 25000/- + Rs. 25000/-) + Rs. 18000/- as 18% GST. Arka Parimala is a Rose variety suited for open cultivation, fragrant, high yielding and resistant to thrips and black spot. Arka Savi, flowers are Purple Red in colour and are produced in bunches, flowers are cut



with pedicel i.e, loose flowers, potential yield of loose flowers expected is 30 tons/acre/year. In addition to high yield, it has added advantage of long shelf life of 5-6 days. In Arka Bangara 2, the flower colour is yellow gold (RHS colour chart Yellow-Orange group 12A), flowering starts 40-45 days after planting and continues to flower for 60 days, flowers are compact and large in size (7.0-7.5 cm), yield potential is 7 tons/acre. Flowers have good shelf life of 5-6 days. Dr. Tejaswini P., Principal Scientist, Division of Flower and Medicinal Crops is the innovator.



## May 2023

**1. ICAR-IIHR Biopesticide technologies** are eco-friendly technologies for sustainable management of nematodes. **IIHR *Trichoderma harzianum*-1% W.P** was licensed to M/s. Bio Prime Agri Solutions Pvt. Ltd, Maharashtra on 17.5.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

**2. IIHR *Trichoderma viride* 1.5% W. P.** an **ICAR-IIHR Biopesticide** technology was licensed to The United Provinces Sugar Company Ltd., Uttar Pradesh on 19.5.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

3. **IIHR *Pochonia chlamydosporia* 1% W. P.** an **ICAR-IIHR Biopesticide** technology was licensed to Nav Durga Agro Science Pvt. Ltd., Uttar Pradesh on 25.5.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

4. **Chilli CGMS LINES IHR 4390 & IHR 4391 and IHR 4392 & IHR 4393** were licensed to Namdhari Seeds Pvt. Ltd., Bengaluru on 23.5.2023. Dr. Madhavi Reddy K., Principal Scientist, Division of Vegetable Crops is the innovator of these technologies. The total license fee of Rs. 07.00 lakhs + Rs.1,26,000 as 18% GST was collected at Agrinnovate India Ltd.. The MoU was exchanged in absentia upon the request of the client. Characteristics of these lines are as follows.

- IHR4290 (A line)/ IHR4291 (B line): Fruits are dark green and turn red on maturity, thick, drooping, solitary, smooth, fruit shape at base round and at apex blunt, medium pungent, tolerant to *Phytophthora* root rot.
- IHR4292 (A line)/ IHR4293 (B line): Fruits are green and turn red on maturity, erect, solitary, slightly wrinkled, fruit shape at base acute and at apex acute, highly pungent.

5. **Chilli CGMS LINES IHR 4390 & IHR 4391 and IHR 4392 & IHR 4393** were licensed to Pan Oceanic Seed Solutions Pvt. Ltd., Bengaluru on 26.5.2023. The total license fee of Rs. 07.00 lakhs + Rs.1,26,000 as 18% GST was received at Agrinnovate India Ltd.. Dr. Madhavi Reddy K., Principal Scientist, Division of Vegetable Crops is the innovator of these technologies. Characteristics of these lines are as follows.

- IHR4290 (A line)/ IHR4291 (B line): Fruits are dark green and turn red on maturity, thick, drooping, solitary, smooth, fruit shape at base round and at apex blunt, medium pungent, tolerant to *Phytophthora* root rot.
- IHR4292 (A line)/ IHR4293 (B line): Fruits are green and turn red on maturity, erect, solitary, slightly wrinkled, fruit shape at base acute and at apex acute, highly pungent.



6. **Chilli, CGMS3 line** was licensed to Alpine Seeds Pvt. Ltd. on 26.5.2023. In chilli F<sub>1</sub> hybrid seed production is very tedious due to small flower size and is labor intensive. Protection of parents of F<sub>1</sub> hybrid in seed production areas is another challenge. Therefore, male sterile system (CGMS) is developed at ICAR-IIHR and is being commercially exploited in chilli F<sub>1</sub> hybrid seed production. Due to its good general combining ability and tolerance to powdery mildew, MS3 can be used in developing high yielding chilli F<sub>1</sub> hybrid suitable for varied market segments. Cost effective, reducing 50% of labor as there is no need for emasculation and no need of tying individual fruit after crossing, if seed production is inside the net. Female parent being male sterile, no problem of getting selfed seeds (avoids mixtures). Dr. Madhavi Reddy K., Principal Scientist, Division of Vegetable Crops is the innovator of this technology. The total license fee of Rs. 3.50 lakhs + Rs. 63,000 as 18% GST was received at Agrinnovate. The MoU was exchanged in absentia upon the request of the client.

### **June 2023 (till 13. 6. 2023)**

1. **Arka Herbiwash**, a simple and safe herbal product. This herbal powder made of dried and powdered plant parts can extent removal of surface residues of pesticides and food borne pathogen from fruits and vegetables upto 80-100% and 90-99%, respectively. Developed by Dr. Debi Sharma, Principal Scientist, Division of Basic Sciences, ICAR-IIHR, Arka Herbiwash technology was licensed to **M/s. Sana Agro Services**, Erode District, Tamil Nadu on 02.06.2023. Total amount charged from client was Rs. 94400/- (License fee Rs. 75000/- + demonstration fee Rs. 5000/- + Rs. 14400/- as 18% GST on both).



**2. ICAR-IIHR Biopesticide technologies** are eco-friendly technologies for sustainable management of nematodes. **IIHR *Pseudomonas fluorescens* 1% W. P** was licensed to **M/s. IIL Biologicals Ltd**, New Delhi on 06.06.2023. The license fee paid at Agrinnovate India Ltd. was Rs. 2.5 lakh along with the applicable GST of 18%. Dr. Umamaheshwari R., Senior Scientist, Division of Crop Protection is the I/c. Scientist for this technology. The MoU was exchanged in absentia upon the request of the client.

**3. Arka High Humidity Storage Box** technology was licensed to **M/s. BARATH TECHNO**, Theni District, Tamil Nadu on 07.06.2023. The fee paid was Rs. 15000/- + GST@18%. Leafy Vegetables are highly perishable in nature which requires high humidity to retain freshness. In order to retain freshness, most of the push cart and retail vegetable vendors cover the leafy vegetables with wet gunny cloth and sprinkle water to maintain high RH% .The process may cause the spoilage of the produce due to condensation of water. To overcome these problem and to store green leafy vegetables in hygienic way Arka High Humidity Storage Box was developed which will retained the freshness and shelf life of leafy vegetables by 36-48h at ambient condition. Dr. Bhuvaneshwari S., Principal Scientist from Div. of PHT and Agril. Engg. is the scientist in charge.



4. **Arka Decomposer** technology was licensed to **M/s. Ecophytocare India Pvt. Ltd.** on 07.06.2023. This technology license includes duly validated mother cultures of the fungal strains *viz.*, *Aspergillus heteromorphus* strain PATHLF-1 (MTCC-11211) and *Aspergillus herteromorphus* strain HSGLF-1 (MTCC-11212), both of which are used for the bioconversion of raw coir pith to fermented cocopeat. A manual outlining the technology; identifying all materials used or required for the effective use of the technology and quality parameters of the finished product is provided to the licensee. Dr. G. Selvakumar, Principal Scientist, Division of Natural Resources is the scientist in charge of Arka Decomposer technology. A license fee of Rs. 1,00,000/- + Rs. 2000/- demonstration fee + 18% GST was charged.



5. **Arka Microbial Consortium (AMC) (Solid + liquid)**, carrier based or liquid microbial product containing N fixing, Zn solubilizing, K mobilizing and plant growth promoting microbes which is widely used as a bio-fertilizer through seed, soil, cocopeat or as a foliar spray. AMC has a shelf life of 6 months at room temperature. It increases yield by 10-15% and reduces N & P fertilizer use by 25%. AMC was licensed to **M/s. Samhita Soil Solutions** on 09.06.2023. License fee charged is 05lakhs + 90,000 (GST 18%) received by Agrinnovate. Dr. G. Selvakumar, Principal Scientist, Division of Natural Resources is the scientist in charge of **Arka Microbial Consortium** technology.



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