

Brief Note on the technologies to be displayed at the Exhibition during the Festival of Innovations 2016

Modified boiler

Subhash Ola
Alwar, Rajasthan

The modified boiler has a mechanism to recycle used steam so that steam (at 130°C), generated by boiling water, returns to the boiler at a temperature of 90-100°C after transferring heat for the useful purpose. Due to the recycling of steam instead of allowing its condensation, fuel and water requirement has reduced drastically.

These modified boilers have been installed in food processing industries (mawa making, jaggery making), textile, plywood, paper, leather and dye industries. Using this technology it is possible to save fuel and water consumption by up to 30 and 80 percent, respectively.

Groundnut digger

Sanjay Kumar Tilwa
Rajkot, Gujarat

Conventionally, groundnut is harvested by manual pulling, using hand hoe followed by manual pulling, or by ploughing followed by manual pulling. Manual harvesting is very laborious, time consuming and not cost effective. The use of animal drawn and tractor powered groundnut harvester has been very limited due to inefficient harvesting.

This tractor (35 HP and above) operated machine digs and uproots the groundnut plant, which is passed over a vibrating conveyor. The separated groundnut can be collected at the rear of machine. The digger, with a field capacity of 1.5 acre per hour, can reduce the cost of harvesting to about 50 per cent of manual harvesting.

Tractor driven onion transplanter

Pandharinath Sarjerao More

Ahmednagar, Maharashtra

This machine can perform three functions at a time *viz.* transplanting onions, applying fertilizer and making irrigation channels. As the tractor moves forward, the seedlings are delivered manually in the delivery chutes for planting and the star wheel type metering mechanism gets the drive to release the fertilizer in the tubes. One driver and four labours are required to operate this machine, using which one hectare area can be covered in eight hours, as against 0.05 hectare area covered by five labours doing transplantation manually.

Multi-crop thresher

Madan Lal Kumawat
Sikar, Rajasthan

This is a high capacity thresher, which can handle multiple crops (cereals, pulses etc.) including groundnuts with minimum machine adjustments. Threshed grains are clean and do not need further cleaning before bagging up, which saves time and energy. The switch-over time for setting it up for different crops is less than 15 minutes. It can be operated by tractor of size 35 hp or above through PTO. Unlike other multi-crop threshers it has a differently designed threshing cylinder and has an additional blower.

Aaruni tilting bullock cart, Innovative Pulley and other agricultural equipment's

Amrutlal Agrawat
Junagadh, Gujarat

A compassionate soul, Amrutbhai Agrawat has learnt to solve problems faced by farmers, women and labourers essentially through his own life experience. Hardship in his early life, created in him a desire to do something about the problems faced by common people. He innovated as many as seven different useful farm implements such as titling bullock

cart, innovative pulley and other agricultural equipment's like groundnut digger, mini kaliu, wheat sowing box etc.

Bamboo Splint Making machine

Lalbiakzuala Ralte & Lalpiangliana Sailo
Aizawl, Mizoram

India is the largest producer of Incense sticks in the world, which are mostly manufactured by tribal people in interior parts of North-Eastern states like (Tripura, Assam, Mizoram etc) using knives, which is very tedious, time consuming and risky. Electricity operated high capacity machines are only suitable for and affordable by industries and are not useful for rural poor who make sticks at home.

Ralte and Sailo have developed a manually operated machine, which can slice bamboo strips as well as convert the strips into sticks. One needs to load the thick bamboo piece and slide the cutter to and fro through the handle. This results in 1.2 mm thin slices of bamboo. These slices are collected and at a time about 50 slices are fed vertically. The cutter is again moved to and fro resulting splints of 1.2 mm width and thickness at a time. An average person can make about 5000 splints per hour.

Innovator has sold more than 2500 units in north-east region of the country. It has great potential for small rural households in bamboo growing areas, self-help groups working with forest departments and NGO's etc. and very useful machine for generating rural household income generation programmes.

Foot operated page turning device for differently abled

Swapnanil Talukdar
Kamrup, Assam

It becomes difficult for people who are unable to use their hands due to disability (amputation, full/partial paralysis or injury) to flip book pages.

The innovator has developed an innovative foot operated page turning machine to help such people. It is a lower limb operated manual small machine to assist upper limb impaired or those which an injury to turn/flip the pages of books easily.

Asu Making Machine for Pochampally Sarees

C Mallesham,
Nalgonda, Andhra Pradesh

Manufacturing Pochampally silk saree requires a hand winding process of yarn (locally termed as Asu) before weaving various patterns on the loom in the traditional 'Tie & Dye' process. This is a very tedious and cumbersome process and involves about 9000 times to and fro hand movements for making one saree and takes one to one and half day in doing this for a saree. Conventionally women have been undertaking this task for decades and suffering from back pain and drudgery.

The Asu machine developed by Mallesham, is an automatic machine consisting of a micro controller, motor, power transmission system and arrangement for switching over the yarn from one spoke to another. User's needs to place bundle of yarn on the specified place, put the thread from the primary spoke to secondary spokes (other side) manually and switch on the machine. After that the machine follows adjusted sequence and completes the task automatically without any kind of human intervention. It completes the Asu making process in 1.5 hrs compared to 1 to 1.5 days in manual method.

This innovation has brought a revolution in the weaver community. Innovator has sold more than 700 machines to the weavers in the districts of Nalgonda and Warangal districts in Andhra Pradesh

Pole Pro - Pole climbing device

Mushtaq Ahmed Dar
Anantnag, Jammu & Kashmir

'Pole Pro' is a lightweight attachment to climber's shoes with a resilient member (that goes around a pole), rollers to provide smooth ascend and a shoe grip that holds the shoes firmly. 'Pole Pro' is ergonomically designed device and provides a temporary yet firm foothold for the climber during his ascend or descend. The Pole Pro is attached to a pole and then the climber has slip in his legs into the shoes on either side of the pole. As the climber lifts the leg, Pole Pro rules along the pole in upward direction. Climber needs to press his leg side ways to provide himself with a firm foot hold by locking the Pole Pro against the pole and then repeating the procedure for the other leg. Thereby enabling the climber to ascend or descend.

Walnut Processing machines

Mushtaq Ahmed Dar

Anantnag, Jammu & Kashmir

Mushtaq Ahmed Dar has developed Walnut Peeler, a unique motor operated machine, which mechanically peel green walnuts in a faster and efficient manner. The device rotates the green walnuts inside a container and the walnuts get peeled due to the cutting blades attached on two discs, the lower and the upper discs. The machines also separates peeled skins and walnut from each other.

The Walnut Cracker developed by innovator cracks the dry walnuts of various sizes, shapes and hardness automatically. The nuts and shells are separated easily and without damaging the nuts which is otherwise done manually. The machine consists of two specially designed adjustable twin rollers with specific geometries to grip the walnut and deliver impact action.

Both walnut peeler and cracker are very efficient, affordable and useful machines for farmers and dry fruits processing units. It helps in saving labor, improves the quality. The machines have the great potential in changing the present socio economic scenario of Kashmir valley through income generation.

“TURBO” - Modified Hydro Electricity Turbine

G K Rathnakar
Chikmagalur, Karnataka

Electricity is the basic necessity and there are number of places where grid connections are not available due to difficult terrain, especially in mountainous regions for purpose of house hold, irrigation and network towers etc. To solve this problem, Innovator has designed a modified hydro turbine to generate shaft power which can be simply installed in a stream of flowing water and the design of the turbine can be customized according to the requirements. Innovator is using this available shaft power mostly to generate electricity for standalone applications. Looking at its multiple utility, many users also used it for alternative applications like hulling, coffee pulping for water pumping applications.

Innovator has installed about 360 turbines, ranging from 2 to 25 KVA in Dakshina Kannada, Kadagu, Hassan and Chikmagalur and districts of Karnataka. He has also installed turbine for Community based power plant where in 20 Villages (254 houses) are using only electricity generated by the turbine. He is also supplying turbine to BSNL and temples in Dakshin Kannada.

Right Biotic-The Fast Antibiotic Finder

Anuradha Pal and team
BITS, Pilani Hyderabad

Right Biotic, fast antibiotic finder, is a point-of-care (POC) device developed for testing antibiotic sensitivity of pathogens found in human urine leading to Urinary Tract Infection (UTI). While the present day UTI culture & sensitivity tests take between 24-72 hours, Right Biotic provides the sensitivity report in ~ 4 hrs.

This novel technology replicates the growth of bacteria in a specialized medium and measures the inhibition of growth of bacteria in the presence of antibiotic. Detection is based on chromogenic endpoints, which are measured using a set of optical sensors.

Multi tree climber

D N Venkat
Coimbatore, Tamil Nadu

Venkat observed the difficulties of tree climbers used in coconut/palm garden. Working on the problem, he came up with a safe and functional model in 2008. The device has a seat so that the climber can climb in a sitting posture. By the up and down movement of upper and lower frame using hands and legs respectively, the user can climb easily on the tree. The seating arrangement and locking system enable the climber to climb up/down without fear.

The climber is available in different variants suitable for trees with different trunk girths. The XL series is suitable for coconut, silver oak and similar trees (with trunk girth between 9-55 inches) while X5 series is suitable for arecanut and coconut trees in heavy rainfall areas (with trunk girth between 15- 65 inches). Using these climbers, one can climb over 10-12 trees per hour.

Tree climber

Late M J Joseph alias Appachan

Kannur, Kerala

M J Joseph had developed a device under the guidance of his father that helps in climbing coconut or areca nut trees. The palm climber consists of two metal loops that are meant for holding the legs. Given the increasing labour constraints, its social value has much increased over time. NIF facilitated sale of his climber to customers in USA, Maldives, Thailand, Australia, Brazil, Mexico etc. A film made on his innovation by Discovery Channel is very popular on Youtube.com.

Rain water syringe: a novel approach of water conservation

K J Antoji

Cochin, Kerala

In this system the roof top rainwater is stored in a pressure tank and injected to a depth below sea water level with the help of PVC pipes. The injected fresh water recharges and dilutes the groundwater. When required, the water can be pumped out from a recharged well. Antoji has installed over 260 rain water injecting systems in different areas of coastal areas.

Pedal operated pump or manually operated pump

Late Vikram Rathore

Adilabad, Telangana

Vikram had developed a cycle operated pump, which could be used for pumping water from rivers, ponds, wells and other water sources at shallow depth. His pump has been value added and now comprises a self-made chasis, pedaling mechanism with a gear box, impeller pump, suction and delivery pipes, etc. This portable pump, which can be made using locally available materials, can be used for lifting water up to 10 feet effectively with discharge around 1000 liters per hour.

Hand operated water lifting pump

N Sakthimainthan

Thiruvarur, Tamil Nadu

This pump is a hand operated low head high discharge portable pump, which can be carried around easily. It can be placed in water, cranked by hand to draw out water. The pump has discharge of 20,000 lph at 0.75 m head and has been tested at TNAU, Coimbatore and improved by CMERI Durgapur. It is useful device for drainage as well.

Natural water cooler

Arvinbhai Patel

Ahmedabad, Gujarat

The Natural Water Cooler is a low cost, energy efficient, environment friendly water cooler that is based on the principle of heat exchange. It cools water naturally according to the external temperature and humidity. The technology has tremendous potential in dry and hot climatic conditions (i.e. tropical) and where electricity is not available. The use of copper tubes for flow of water has health benefits too. It is available in 100 and 150 liter capacity and is able to reduce the temperature of input water by 8°C to 10°C depending upon the ambient conditions (temperature and humidity). It is most suited for use in public places such as bus depots, roads, gardens, parks, colleges, hostels, etc. The device is tested by SPERI (MNRE Approved Test Laboratory).

Tender coconut breaker and instant cooler

Vinod Mahadeviah

Bangalore, Karnataka

The innovator has developed a machine that breaks a tender coconut, draws out its water and cools it instantaneously. The cutter has been customized for cracking the coconut. The coconut water passes the cooler through the collecting tray and passing through ice covered pipes gets cooled to about 14-15 degree C. At its maximum capacity, the machine can cool about 400 glasses (200 ml) of coconut water.

Arrowroot grinding machine

A T Thomas

Kottayam, Kerala

Not comfortable with the manual process of powdering arrowroot, Thomas, developed this machine about fifteen years ago. This grinding machine has a roller with projections. The roller is powered by an electric motor of one hp. The arrowroot is crushed between the walls of the machine and the roller yielding arrowroot powder. The machine can powder about 300 kg of fresh arrowroot in an hour. Manually one person can grind only 5 kg arrowroot per hour.

Grain sorting Machine

Mohan Sharma

Birbhum, West Bengal

Traditionally, paddy husk is removed by winnowing and grains are sorted manually. Mohan has developed a machine to mechanize the task. The machine works on the principle of winnowing, sorting rice grains as complete grains, broken grains and black/inedible grains. It also separates husk and stones, and can be operated manually or using mechanical power. The manual machine costs Rs 6000/- and can process over 400 kg of rice per hour. Mohan has sold over 2000 machines in his region.

Energy efficient stove

V Jayprakash

Kozhikode, Kerala

To meet their daily cooking energy needs, large number of households in the country's rural areas used traditional chulha/stoves, which consume firewood and other biomass as fuel. This stove has an additional/secondary combustion chamber for burning the un-burnt biomass and hydrocarbons. As a result, the thermal efficiency of the stove has improved while the pollution has reduced. It can use coconut shell or wood as a fuel. The combustion efficiency is in the range of 37.67% when wood is used as a fuel and 29.48% when coconut shell is used.

Egg incubator

Milonjyoti Das
Kamrup, Assam

Eggs need controlled heat and humidity to incubate properly. Milonjyoti has developed a twin chambered egg incubator made of plywood lined with thermocol. The incubator can be heated by electric light as well as a kerosene lamp, used in case of power failure. There is a regulator to control the intensity of the light as well.

Heavy duty single phase welding machine

Sukhram Mistri
Lohardaga, Jharkhand

This single phase welding machine is an efficient machine, which can tolerate wide fluctuation in voltage. It can work on a single phase or double phase power supply. NIF facilitated its testing at BIT Mesra, Ranchi and IIT, Guwahati. Experts have opined that low insulation on secondary winding and the use of individual aluminium wires acting as a single solid conductor results in higher current carriage and effectively better welding.

Effective sound speaker system

R Pakkyanathan
Perambalure, Tamil Nadu

Pakkyanathan, who has been running the business of renting music sound systems, observed that the existing sound speakers did not have the same quality that he wanted. To overcome these problems and achieve a dramatic sound effect, he designed a circular speaker assembly in stainless steel. The speakers are artfully presented in subtle curves and stunning finesse. They give better dramatic sound effect and desired strong bass for extra punch.

An ergonomic spade

Mohd. Rafiq Ahangar
Anantnag, Jammu and Kashmir

Rafiq has developed an ergonomic spade which can be used for lifting, and moving bulk materials, such as soil, coal, gravel, snow, sand, or ore. This tool consists of a broad blade permanently fixed to a handle with adjustable length and can also comprise of a shaft in which the length of handle can be changed. The novel feature of this spade compared to other locally available models is that the blade and the handle of this tool are rotatable at the angle of 360 degree. This novel addition has greatly reduced the physical burden on the wrist when the user is involved in repeated movement of lifting and twisting of wrist to dispose the material held in the blade.

A multipurpose axe

Mohd. Rafiq Ahangar

Anantnag, Jammu and Kashmir

The multipurpose axe is an innovative multi-utility tool. This tool basically has an axe attached to one end of a hollow handle and a nail remover at the other end. The axe can also be converted into a shovel by rotating the blade by 45 degree and can be held in either positions through a cotterpin. The hollow tube can also hold other utility accessories like linear saw blade, screw driver, Chisel, knife and a filing tool of different shapes, designs and sizes. A hammer has also been provided at the back of the axe blade.

Inclined installation of water taps at schools and other public places

Chhaya Sambhoji Thakor

Gandhinagar, Gujarat

In almost all the schools, water taps are at the same height from the ground. Taller and shorter children have to face discomfort in drinking water. Chhaya's idea is to have taps arranged at an incline instead of present horizontal arrangement so that a student can use the tap suitable as per his/ her height.

Height adjustable wash basin

Akanksha Guha

Pauri Garhwal, Uttarakhand

Akanksha's idea is to have the entire wash basin, drain and mirror assembly vertically adjustable so that people of different heights can easily use it without any problem. Akansha's father had a lot of discomfort bending forward and using the basin when he had a spine inquiry. She noticed this and recalled that she also faced a lot of problem as a young child trying to reach the basin.

Wrapper picker

Mukul Malaviya and Diptanshu Malaviya
Sirohi, Rajasthan

Mukul and Diptanshu thought about this device when they saw a sweeper picking up waste pouches, pieces of paper, and empty wafer packets littered across a bus station. They realised how difficult it must be for him to bend every time to pick up such pieces and came up with this device. The wrapper picker is a motorized device, which automatically picks up littered pieces of wrappers, papers, pouches, etc and collects them in a storage bin.

Modified hand cart with steering mechanism and brakes

Nidhi Kumari Gupta, Md. Usman Hanif Patel, Pavithra, Vidya Ramesh
Muzaffarpur, Bihar, Jalgaon, Maharashtra, Erode, Tamil Nadu. Bangalore, Karnataka

Every street vendor using a hand cart has to lift it to turn it, which may be difficult due to the weight of the cart and the load it carries. The conventional hand carts also do not have a braking mechanism, which is required many times. The students have given an idea to incorporate a steering mechanism so that it becomes easier for the vendor to maneuver it easily. They also suggest incorporating brakes so that the cart can be easily stopped whenever needed especially on the slopes. A retrofitting attachment for the purpose may also be developed so that it can be fitted in any existing cart.

Rice grain sorting/cleaning machine

Mohd. Sajid Ansari
Ranchi, Jharkhand

Seeing his mother hassled while cleaning rice every day, Sajid thought of making a device to help her. This automatic machine separates broken rice grains and other physical impurities from unbroken rice grains.

A portable alerting system and a method thereof

Lakshya Kaura
New Delhi, Delhi

A system and method for an alerting mechanism that will intimate a user about the approaching threat like moving object or emergency alarms in real time using the handheld device in crowded areas. The system comprises a camera for the purpose of continuously receiving live video feeds for identifying moving objects and a microphone for the purpose of receiving auditory signals for searching specific auditory signatures such as a vehicle horn, an emergency alarm, a police siren, or any other sounds which may indicate danger to the user. The system processes video feed and auditory signal, and executes an alert response to the user if threat is detected by the processor.

Posture correcting chair

Kulsoom Rizavi and Tarun Anand
Lucknow, Uttar Pradesh, Ghaziabad, Uttar Pradesh

This is a smart chair with sensors at appropriate places, which alerts the user sitting in a wrong posture. Both the students conceived this idea independently after being regularly scolded by their mothers for using a bad posture. ST Microelectronics has helped in developing the prototype.

Anti molestation device for women worn on wrist

Manu Chopra
Delhi

Manu gave the idea of a watch like device capable of monitoring pulse rate and nerve impulse. Any significant increase in both the parameters (due to an emergency especially when someone is trying to trouble) will activate electricity in the upper portion of the device. When the person trying to molest will catch hold of the wrist, he would get a shock that would give sufficient time to the girl to run away.

Chaff cutter cum waste shredder

Surya Prakash and Anurag Pathak
Sonbhadra, Uttar Pradesh

The Dalla Cement Factory set up an RDF (Refuse-Derived Fuel) unit to generate energy from refuse materials like waste rubber, plastic and cloth. To shred these materials into required size for burning in the oven, the unit needed a shredder. The students of VITC took this up as a project and modified a manually operated chaff cutter into motorized machine suitable for the purpose. The blades of the shredder machine are arranged at an eccentric angle to ensure optimum cutting of waste material.

Low cost PVC pipe joining machine

Pushparaj Mishra and Shivam Shrivastava
Sonabhadra, Uttar Pradesh

The machines available in the market for joining PVC pipes are costly and have narrow size ranges. In order to overcome this limit, the ITI students have developed a cost effective machine, which can join pipes with diameters in the range of 80 – 200 mm. The ends of pipes to be joined are heated to about 180 degree C and pressed together using a hydraulic jack. Once the ends of the pipes get joined, they are unclamped from the machine.

GSM based short-circuit alarm

Nasruddin Ismail Kadivar
Morbi, Gujarat

Sometimes short-circuits occur in houses in the absence of inmates resulting in incidences of fire. The idea is to have a GSM based alarm, which can alert the owner about the occurrence of such an incidence.

Alert switch in bus/auto rickshaw for the safety of women

Satiya Sonal Khetabhai
Surendranagar, Gujarat

The idea is to have a switch in every public vehicle which when pressed will send a message (audio or sms) to the nearest police station or predestinated number with details of vehicle and its location. This will help the police to react quickly and reach quickly at the given location.

Solar lathe

Gopani Rajan R
Morbi, Gujarat

Availability of regular electricity supply is a problem at many places. The problem compounds when one needs to operate machines to undertake tasks and earn a livelihood. In order to overcome the problem, Gopani thought of powering the lathe and other production machines using solar power, which will have negligible operational cost.

Adjustable bench vice according to the height of user

Asraf Gulabrasoolbhai Mesaniya
Morbi, Gujarat

Bench vices are generally fixed on the work bench. Many times, people of different heights working on a job cannot utilize their power properly with the job fixed on a fixed height vice. In order to utilize human power properly along with providing ergonomic comfort, Asraf suggests developing bench vice with provision of adjusting height according to height of user is felt.

Simple flushing mechanism for public urinal commode

R. Manoj

Karimnagar, Telangana

This is a lever operated mechanical system, which facilitates automatic flushing in urinals/ toilets. This consists of a main water reservoir and a flush cistern linked with a rod mechanism such that one closes when the other is open. The weight of the person moves a lever facilitating flow of water from the main tank to the cistern. When the person moves away, cistern opening gets opened and water flows down automatically flushing the toilet.

Semi-automatic printing machine

Rishank Bhardwaj

Baghpat, Uttar Pradesh

This is a power operated semi-automatic machine, where human intervention is only required for placing and removing the paper. Once operational it automatically lifts frame and spreads ink over it. It is quite easy to operate.

An innovative device: fusion of Hamam and Tandoor

Parvati Bhardwaj

Kullu, Himachal Pradesh

This is an energy saving three layered device, with the inner layer being the burning chamber (used for cooking), middle layer comprises a water jacket (storing and heating water) and the outer layer is of insulation material. This device also has a smoke pipe with filter to reduce particle release in the atmosphere and can also be used as a room heater during the winters.

Vacant chair indication in auditoriums

Niraj Paspule

Pune, Maharashtra

Many times it becomes difficult to locate a vacant space in an auditorium. The idea is to have an audio/ visual indication system in chair, which

makes easy for a person entering an auditorium to locate the vacant chair(s) from a distance.

Improved bullock cart for transportation of sugarcane

Vaishanvi Nalvade
Satara, Maharashtra

Vaishnavi has added a third wheel to the front axle to reduce the load on neck of bullocks. She has also provided shock-absorbers and ball bearings to wheel, to make it easy to pull the loaded cart. It also has brakes to make it easy for the farmer to slow or stop the cart.

Modified multipurpose chulha

Vidushi Sharma
Kullu, Himachal Pradesh

This is a chulha with insulated coiled tubes to heat water while the food is being cooked. The chulha is also insulated from the outside to reduce heat losses resulting in the food being prepared in lesser time.

Automatic waste converter

S. Vishwa
Virudhunagar, Tamil Nadu

This is a dustbin that burns down dry waste into ash, which can then be used as a fertilizer. The sensor fitted at the top of the dustbin triggers ignition at the base as soon as the dry waste gets filled up to the brim.

Captan Basti - improved sugarcane variety

Aagya Ram Verma
Basti, Uttar Pradesh

This sugarcane variety has been developed through cross pollination from two high yielding varieties *viz.* CO-95255 & CO-8102. The variety has large canes (15-18 ft), high yield (1500-1600 q/ha), long internodes (18-

20 cm), high sugar content (12-13%) and broad leaves. This variety is disease tolerant and can grow in both seasons viz. autumn and spring.

HRMN 99 - apple variety for plain areas

Hariman Sharma

Bilaspur, Himachal Pradesh

Usually apple is cultivated at an altitude ranging between 5,000-8,500 feet above mean sea level in the Himalayan ranges, which experience about 1,000-1,500 hours of chilling. The variety developed by Hariman can grow at low altitude (1800 feet above mean sea level) and does not require chilling hours. It is self-pollinating and regular bearing variety which is ready to harvest in early June (after three years of transplantation). It is also tolerant to scab disease.

JK-1 - Improved Hyacinth Bean variety

Jitabhai Kodarbhai Patel

Sabarkantha, Gujarat

The hyacinth bean variety, JK-1, has been developed from a local variety using selection method. The variety is early maturing (60 to 65 days), has higher green pod yield (143.7 t/ha), high number of pods per bunch (25 to 30 pods) and higher dry seed yield (64.6 t/ha).

Pandrinath-1: Improved variety of soybean

Kashinath N. Lokhande

Betul, Madhya Pradesh

In 2008, Kashinath observed some healthy plants with early maturation (10-12 days early) of variety JS-9752 in his field. He selectively harvested about 300g of seeds. In 2009, he cultivated the seeds in separated rows and harvested 15kg of seed. He adopted similar practice every year and in 2012 he had about 75q of seeds of this variety.

The variety is tolerant to Yellow Mosaic disease, has bold seeds (17.3g/100 seeds), and high yield (12-15 quintal per acre). It is suitable for both the seasons *Khaif* and *Rabi*. It is also suitable under heavy rain and drought

conditions.

PNS VAIGAI: Improved cardamom variety

Late Shri P. N. Surulivel

Theni, Tamil Nadu

In 1986 Late Shri P.N. Surulivel cross pollinated Mysore type cardamom with non- *Mysore* type, which could withstand heavy rain and drought conditions. Through continuous efforts over a period of 5 years, some plants with better growth, yield, and tolerance to biotic and abiotic stress were developed and characters could be stabilized. During 1994-96, the plants were multiplied on large scale.

The average yield of dry capsules is 2400-3500 kg/ha, dark green & ovoid shape capsules and high dry recovery percentage (>22). This variety, which can withstand heavy rains and drought conditions, is also tolerant to biotic and abiotic stress.

Niranjan Bhata: Improved brinjal variety

Leela Ram Sahu

Dhamtari, Chhattisgarh

It was developed by mass selection method from a traditional variety conserved by his forefathers. He has been cultivating the conserved variety from last 27 years. He intentionally started selection and developed this variety based on its fruit length, yield and tolerance to major insect-pests and diseases. The fruits are long (average size 45 cm), have soft pulp and are sweet in taste.

Durga- 4: Improved carrot variety

Madan Lal Devada

Jodhpur, Rajasthan

Madan Lal developed this variety from a local carrot variety grown in his region and has been growing it for the last 15 years. He selected the longest and healthiest carrots of the variety and planted them for seed production

through root to seed method. Each year through selection and grading he stabilized the characters. The carrots of the variety are long (up to 36 inches), have shiny light red colour, are sweet in taste, and have a long shelf life. The long leaves of the carrot can also be used as fodder.

Kudrat Geeta: Improved mustard variety

Prakash Singh Raghuvanshi
Varanasi, Uttar Pradesh

Prakash Singh has developed an improved high yielding mustard variety from Varuna by mass selection method. The variety gives high yield (10 q/acre), high number of seeds per siliqua (35) and high oil content (41.00%).

Kudrat-5: Improved high yielding paddy variety

Prakash Singh Raghuvanshi
Varanasi, Uttar Pradesh

Prakash Singh has developed an improved high yielding paddy variety Kudrat-5 by mass selection method from a local parent variety. The variety has high number of productive tillers, lengthy spikes, more number of seeds (like cumin) per spike, and yields 32 q per acre. The variety is tolerant to blight disease as well.

Kudrat-3: Improved pigeon pea variety

Prakash Singh Raghuvanshi
Varanasi, Uttar Pradesh

Prakash Singh Raghuvanshi has developed Kudrat-3 pigeon pea variety from ICPL 87 variety by selection method. Kudrat-3 is high yielding (30 to 35 q/ha) perennial variety, which takes 230-235 days to maturity. It bears high number of pods/plant (500-700) with each pod being 6-8 cm long with 4-6 bold seeds.

Kudrat-9: Improved and high yielding wheat variety

Prakash Singh Raghuvanshi

Varanasi, Uttar Pradesh

Prakash Singh Raghuvanshi has developed an improved and high yielding wheat variety Kudrat-9 by mass selection method from Kalyan Sona variety. The salient feature of the variety include higher number of ear bearing tillers, lengthy spikes, more number of seeds per spike, robust stem, and high protein content.

Maring Mairen Selection: Improved pumpkin varieties

Sapam Lukhoi Singh

Thoubal, Manipur

In 2003, Sapam bought a pumpkin fruit from a local market. He collected seeds for sowing in the next crop season. At maturity stage, he found the fruits were of three types- pot shaped (2-2.5 kg) rectangular shape (3.5 - 4kg) and round with broad based (3.5 - 4kg). During 2004 - 06, he selected seeds from last two types of fruits separately and sowed with the purpose of increasing size and variety stabilization. Both are high yielding (120-240q/ha, round variety; 125-150 q/ha, rectangular variety) and have compact flesh and are delicious in taste.

Makhayat Mubi Selection: Improved pea variety

Sapam Lukhoi Singh

Thoubal, Manipur

Sapam developed an improved pea variety with curve pods, more branches with more number of seeds/pod, from a local variety through selection. This is a high yielding variety (24 t/ha), has more number of branches, pods, and seeds. The flowers are white in colour and the seeds with black hilum. This variety is tastier than other local popular varieties.

Aber Chaibi Selection: Improved potato variety

Sapam Lukhoi Singh

Thoubal, Manipur

Sapam developed an improved variety of potato from a local potato variety Aberchaibi by selection method based on large plants with red colored

tubers. This particular variety is high yielding (14-19 t/ha) and tolerant to leaf curl and bacterial rot. The leaves are smaller than *kufri jyoti* variety, and the tubers are red in colour.

NMS-2: Improved paddy variety

Shankara Guru

Mysore, Karnataka

Shankara Guru, has been growing an improved and high yielding variety of paddy 'NMS-2' developed through simple selection from local heterogeneous landrace varieties. Suitability for low external input cultivation, high tolerance to biotic and abiotic stress, resistant to shattering, quality fodder, fine rice quality with brick red colour grains are the distinctive features of this variety with the yield being 80 q/ha.

Animakhai Chabi Selection: Improved cauliflower variety

Smt. Keisham Thoibi Devi

Bishnupur, Manipur

Smt. Keisham Thoibi Devi developed the improved cauliflower variety through selection from a local variety. The variety has an average yield of 60 q/ha, early maturity (75 days for market & 150 days for seed harvest), delectable taste, and is tolerant to insects and pests.

SR-1: Improved and high yielding chickpea variety

Sundaram Verma

Sikar, Rajasthan

Sundaram Verma developed SR1- a high yielding chickpea variety from a local variety through mass selection method. SR 1 is medium bold seeded variety and gives good yield in drought conditions. The yield is about 25-30 quintals/ha and the variety is suitable for both arid and semi- arid regions. It has bold seeds with attractive colour, is tolerant to root rot disease, and because of its characters fetches higher market value.

SR-23: Improved and high yielding cluster bean

Sundaram Verma

Sikar, Rajasthan

Sundaram developed this variety with uniform height, synchronous maturity and higher yield through mass selection method. The variety is high yielding (20 to 25 q/ha), drought tolerant, resistant to insect-pest and diseases, has high percentage and good quality of gum, and fetches good price in the market.

Improved Nutmeg Variety

Tom C Antony

Kottayam, Kerala

While doing budding work in a farm Antony saw a nutmeg completely covered with mace. He selected some buds and budded onto a wild root stalk. The average yield is 2000 fruits/tree/year with dry recovery of nut and mace, 40 and 20 percentage respectively, has long nut and oval shaped fruits, bold mace which entirely covers the nut, and small wavy leaves. The other peculiarity of the variety is growing upwards as tier. Fruits setting begin after reaching 5-6 tiers in 4 years.

Improved *Anthurium* varieties

D. Vasini Bai

Thiruvananthapuram, Kerala

Vasini Bai has developed 10 varieties of *Anthurium* by cross pollination method. She selected good and healthy plants of following parent varieties: Sunset orange X Tropical red, Seasor violet X Ulter, Agnigothry X Senator and crossed manually for 4-5 days, four - seven days old flowers. In five-seven months the number of pepper like fruits were obtained having one-two seeds. Large and medium sized flowers with rare color combinations of spathe and spadix is the uniqueness of these varieties along with long stalks and better shelf life.

Animal Health Related Products

Community knowledge

Based on the knowledge provided by traditional knowledge holders and communities, herbal formulations have been developed by NIF to treat veterinary diseases or address medical conditions. These include medications to overcome silent estrus, cure bloat, cure wound including maggot wound, prevent and cure retention of placenta, alleviate ephemeral fever, cure fever of unknown origin, promote general health and vitality of animal, cure ecto/endoparasite infestation, cure diarrhoea, enhance milk production, cure mastitis (bacterial), cure hematuria among others.

Human Health Related Products

Community knowledge

Based on the knowledge provided by traditional knowledge holders and communities, herbal formulations have been developed for various purposes which include pain relief cream, mosquito repellent cream, skin care creams, shampoos, oil, etc. In addition, nutraceutical products like multi grain cookies/ khakhras have also been developed.
