

# Farm

## Innovators - 2010



हर कदम, हर डगर  
किसानों का हमसफर  
भारतीय कृषि अनुसंधान परिषद

*Agri*search with a human touch



Division of Agricultural Extension  
Indian Council of Agricultural Research  
New Delhi 110 012

# Farm Innovators–2010



**Division of Agricultural Extension**  
Indian Council of Agricultural Research  
New Delhi 110 012

Printed : October 2010

Citation : Farm Innovators–2010, ICAR, New Delhi

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The wisdom of the farm innovators, who have contributed their innovations to this publication, is appreciated and duly acknowledged. The efforts of the Programme Coordinators of KVKs, Zonal and National level committees in bringing out this document are acknowledged with thanks.

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Minister of Agriculture  
& Consumer Affairs  
Food & Public Distribution  
Government of India

## Message

INDIAN Agriculture is striving towards inclusive growth by ensuring augmentation in productivity, sustainability and profitability by integrating experiences and efforts of the concerned stakeholders. To achieve this, innovation in technology, institution and policy is the key. Going beyond the technologies generated by the research institutions, drawing innovations and reinventions by the farmers for widening basket of the demand-driven technologies to suit various agroclimatic conditions is crucial to have quantum jump in agricultural production to feed burgeoning Indian population in the years to come.

In this endeavour, it is heartening to learn that our farming community has developed a number of valuable innovations, and have proved potential through the application of these innovations in fellow farmer's fields also. I express my gratitude to them.

Recognizing this farmers' potentiality of, documenting their innovations and encouraging them for partnership with the agricultural researchers are equally important in the long run to effectively face challenges and to fully exploit new opportunities.

I am glad that the ICAR is making considerable efforts in bringing farm innovators together on one platform, and documenting their innovations. I am sure such an initiative would reorient process of research and development in the country.

(Sharad Pawar)

18 October, 2010

New Delhi



Minister of State for Agriculture  
& Consumer Affairs  
Food and Public Distribution  
Government of India

## Farmers as Innovators

INDIAN agriculture is unique with diverse agroclimatic conditions. Contributions of the agricultural scientists in the evolution of modern technologies for transforming Indian agriculture and achieving food security are laudable. Gone are the days when farmers were mere beneficiaries of top-to-down dissemination of technologies. Days have come to recognize bottom-up innovations and of equal partnership of farmers in agricultural research and development.

Realizing this, there is a greater need to identify, recognize and promote those farmers who are actually grassroot innovators of agricultural technologies. These innovations have emerged out of farmers vast experience and wisdom-based on their analysis of their own micro-level farming situations. Such explorations have led to the development of numerous technologies including new varieties by the farmers.

The Indian Council of Agricultural Research has very rightly initiated documentation of farmers' innovations across the country. I admire the Director General of the ICAR and his team for their dedicated efforts and commitment to the cause of agriculture and farmers of the country.

(K.V. Thomas)

18 October, 2010  
New Delhi



Secretary  
Department of Agricultural Research & Education  
and  
Director General  
Indian Council of Agricultural Research  
Government of India

## Farmers' Innovations for Prosperous Agriculture

**T**ECHNOLOGY transformation for sustainable production, productivity and profitability depends on the decisions and action of millions of farmers. Agricultural scientists in the country are striving towards developing appropriate technologies to suit to complex and diverse agro-ecological situations at the farm level.

Concerted efforts are being made to involve farmers as effective partners in evolving technologies not merely for and adopting and adapting lab-based technologies but also to encourage them as innovators for location specific technologies and for upscaling those innovations.

The Council is dedicated to the cause of farmers and farming and visualizes massive farmers-scientists contact to identify and recognize farmers' potential for giving a thrust to agricultural production and productivity. The innovator farmers are strategically important to design, develop and implement any research and development programme of the ICAR.

I am happy that the Agricultural Extension Division of the ICAR has taken up a maiden attempt to document farmers' innovations across the country.

I appreciate Dr K.D. Kokate, Deputy Director General (Agril. Extn), and his team for bringing out this valuable publication on "Farm Innovators-2010" which may bring in paradigm shift towards participatory technology development.

(S. Ayyappan)

18 October, 2010  
New Delhi

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# Prologue

Innovations play an important role in food production as well as in optimizing resource utilization by farmers. An innovation is an idea, practice or object that is perceived as new by an individual or others in a given system. The technologies/practices that are developed through research are innovations which may be new varieties of crops and plants, new breeds of livestock, new chemicals and medicines, new technique of doing things etc. Irrespective of time period the idea or practice was originally developed, when a person first becomes aware of it, it is an innovation to that person. Using something old in new ways or applying something new to successfully produce desired social and economic outcome is an innovation.

Apart from innovations and scientific package of practices developed and transferred from R&D institutes, innovations in the form of grassroot level technologies and methodologies developed by some of the innovative farmers and rural youth are benefiting widely to farmers and have also been accepted across the system. Such innovative technologies and methodologies are largely confined to some locations. Benefits accrued from such innovative ideas need to be widely shared across the country. And the scientific talents behind such grassroot level innovations need to be encouraged and recognized. Valuable ideas and techniques generated by them largely go unnoticed owing to lack of proper documentation and opportunities for wider dissemination. An initial and pioneering attempt in this direction has been made by the Division of Agricultural Extension, ICAR, to document such innovations developed across the country in the form of this publication “Farm Innovators – 2010” for the benefit of various stakeholders.

The KVKs across the country and eight Zonal Project Directors have played a key role in searching and documenting these innovations of practical importance. The Zonal level expert committee analyzed innovations for their scientific logic and further screening was done at national level for selecting innovations with sound scientific base and wider applicability in the country.

To start with the Zonal level Committees discussed on the subject and formulated guidelines for documenting innovations made by the farmers/rural youth at the district level. The guidelines include seven major and 35 sub-parameters which are as follows:

1. Nature of the innovation (description of innovation)
2. Problem statement (nature and intensity of the problem addressed, genesis of idea, sources of information relevant to the innovation, original innovation or modification of any existing technology)
3. Process of technology development (conceptualization of idea, scientific rationale about the innovation, experimentation/trial conducted, technical support during the experimentation period, supporting data for the innovation, any resource mobilization from outside agencies/organizations for the development of technology, relative advantages of innovation like adaptability, eco-friendliness, sustainability, gender friendliness, economical viability, benefit-cost ratio etc)
4. Replication and promotion (horizontal spread of innovation and number of farmers adopting, socio-economic implications, presentation of innovation in scientific fora, publication on the innovation in farm journals, media coverage of the innovation, display of innovation in exhibitions/kisan melas, income generated out of this innovation by the innovator, feed-back from farmers and other agencies)
5. Recognition (institutional acceptance of the innovation, recognition in the form of honours, certificates/awards etc.)
6. Supporting documents (action photographs, printed materials/electronic materials like CD, video clippings etc, photo copies of certificates of honours)

7. Profile of farmer (recent passport size photo, name and address, phone number (mobile, landline), email ID, age as on 31 March, 2010, educational qualification, landholding (in ha), farming experience (in years), name of the crops/livestock/other enterprises adopted by the farmer, social recognition like member, leader, president etc in social institutions)

With these parameters a proforma was prepared and circulated to all KVKs with suitable instructions for collecting data. Programme Coordinators (PCs) of KVKs along with their respective Subject Matter Specialists (SMSs) identified, interviewed, verified innovations in action and collected data. The data were tabulated and analyzed. The Programme Coordinators were clarified of their doubts while documenting the innovations. As per the suggestions and guidelines of the Zonal Level Committees and approved by DDG (AE), one page write up on each innovation was prepared that include thematic area, title of innovation, description of innovation, practical utility of innovation, profile of farmer with a passport size photo of the farmer, photographs of innovation and address and phone number(s) for communication.

Put together all eight Zonal Project Directorates received a total of 554 farm innovations, and the respective Zonal Level Committees further scrutinized innovations and as an outcome 196 selected innovations were submitted to the Division of Agricultural Extension, ICAR, New Delhi for further scrutiny by the national level committee. Out of 196 farm innovations received 139 were finalized under eight thematic areas—Crop improvement (13); Crop production (16); Crop diversification (8); Crop protection (14); Farm machinery (61); Water Management (8); Live stock and fisheries management (10) and Post harvest technology and value-addition (9).

These 139 selected innovations have been documented and presented in this publication in an uniform format giving details of innovators, innovations and their applications illustrated with suitable photographs.



THEMATIC AREA 1

# CROP IMPROVEMENT



## Ekalavya – Ashgourd Variety

**Shri A.S. Joy**

Alappatt House, Post Puthanchira, District Thrissur, Kerala  
(Mobile : 09447815652, e-mail : joyalapat2010@gmail.com)

### Profile

Age	: 34 years
Education	: B.A (Economics)
Landholding	: 130 cents (Homestead)
Farming experience	: 14 years
Crops grown	: Coconut, nutmeg, mango, cucumber.

### Recognition

Her Excellency Smt.Pratibha Patil, President of India presented the National Award to Shri A. S. Joy for developing Yellow Mosaic Resistant ash gourd variety *Ekalavya* and cash prize of Rs. 25000/- in the Fifth National Grassroots Technological Innovations and Traditional Knowledge Awards Ceremony held on 18 November, 2008.

### Description of innovation

Yellow mosaic resistant ashgourd variety *Ekalavya* has been developed by Shri A.S. Joy by crossing a local variety with a resistant variety, followed by repeated selections. *Ekalavya* takes 35-40 days to flower and 90-100 days to mature. Average weight per fruit is 12 kg during monsoon and 4-6 kg during summer. Average yield is 250 tonnes per ha with average yield of 10 kg per plant. It is a short duration variety and has good cooking quality as well as taste. Dark green colour of the leaves is speciality of this variety.

### Practical utility of innovation

Existing ashgourd varieties are susceptible to yellow mosaic virus, resulting in leaf yellowing, stunting of growth and malformation of fruits. Plants usually get affected at one month stage of crop resulting in total crop loss. Farmers are not able to control this disease by usual plant protection measures. *Ekalavya* has been found highly adaptive, eco-friendly, high yielder and resistant to yellow mosaic virus. At present, 500 farmers are cultivating this variety.



*Ekalavya* – Yellow mosaic resistant variety of ashgourd



## Pepper Thekken - Black Pepper Variety

**Shri T.T. Thomas**

Thekkel, Post Kanchiyar, District Idukki, Kerala  
(Mobile : 09961463035)

### Profile

Age	: 70 years
Education	: 8 <sup>th</sup> class
Landholding	: 6 acres
Farming experience	: 50 years
Crops grown	: Cardamom and pepper

### Recognition

Innovation has been documented through electronic media (video) by the National Innovation Foundation (NIF), Gujarat. Innovator has received certificate of honour from KVK, Kannur, Kattappana Block Panchayath, Kanchiyar Grama Panchayath, Bharathiya Janatha Karshaka Morcha, KVK, Idukki and Certificate of Merit from Society for Research and Initiatives for sustainable Technologies and Institutions, Ahmedabad.

### Description of innovation

The variety *Pepper Thekken* is a natural mutant of *Piper nigerum* (black pepper), identified in the forest area of Kanchiyar in Kattappana Panchayath, Idukki District Kerala by Shri T.T. Thomas and has been cultivated by him for the past 25 years. The speciality of the variety is that its spikes are fully branched, while other pepper varieties are single spiked without branches. Each of the spike has about 60-80 branches. Each spike including branches and sub-branches bears about 800-1000 berries as against 60-80 berries in the locally grown high yielding pepper varieties. Thus, the plant has high yield potential.

### Practical utility of innovation

The pepper varieties normally grown in the high ranges of Idukki District yield about 3,000 kg/ha (dry weight) and are highly susceptible to wilt disease. The farmer's innovation – *Pepper Thekken* yields about 8,600 kg/ha (dry weight), and is highly disease tolerant. More than 200 farmers are cultivating this variety in Idukki, Alappuzha, Pathanamthitta and Wynad districts.



*Pepper Thekken*



## Panikulangara No. 1, 2– Small Cardamom Varieties

**Shri Joy Peter**

Panikulangara House, Kallar, Post Vattayar, Munnar, District Idukki, Kerala  
(Phones : 04864-278202, 09496064122, 09496753009, 9961812833)

### Profile

Age	: 63 years
Education	: SSLC
Landholding	: 15 acres
Farming experience	: 30 years
Crops grown	: Cardamom, pepper, coffee, areca nut, coconut, nutmeg, clove, cocoa, vanilla
Livestock	: Dairy cattle

### Recognition

President of Cardamom Growers Association, Pallivasal Branch, Munnar, Idukki District, Kerala

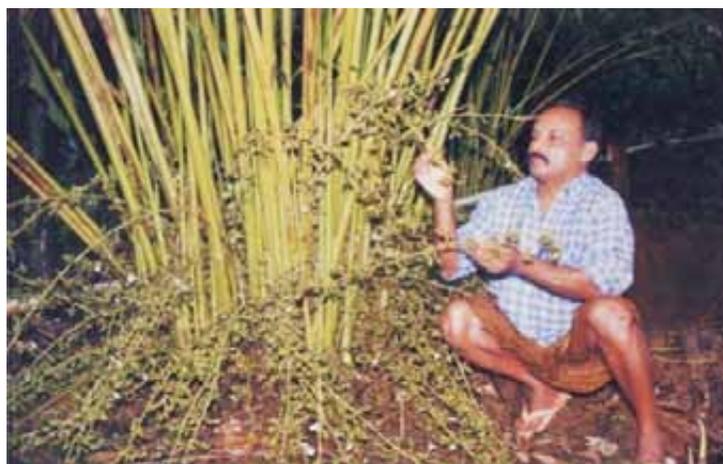
Received certificates and was honoured by KVK, Idukki, Pallivasal Gramapanchayath, KVK, Kannur and mass media viz. Prasarbharati and Jeevan TV

### Description of innovation

Joy Peter developed two landraces of cardamom– *Panikulangara No.1, 2*. Capsules of these varieties are 8 mm in size and are comparatively bold. These varieties are suitable for rainfed condition and tolerant to pests and diseases.

### Practical utility of innovation

*Panikulangara* varieties are high yielding as compared to the other varieties grown in Idukki District . They are found to perform well under rainfed conditions and hence suitable for areas that lack adequate irrigation facilities. These varieties grow well even under open conditions, with lesser incidence of chlorosis as well as pests and diseases that reduce cost of plant protection and quantity of pesticides usage. As the capsules are more bolder with more oil content, farmers get higher price for their produce.



*Panikulangara* small cardamom landrace



# Thiruthali-Root Grub Resistant Small Cardamom Variety

**Shri T.P. Joseph**

Thiruthalil House, Post Pethotty, Santhanpara District Idukki, Kerala  
(Phones: 04868-24716, 09946566820)

## Profile

Age	: 73 years
Education	: SSLC
Landholding	: 10 acres
Farming experience	: 50 years
Crops grown	: Cardamom and pepper

## Recognition

Received certificate of honour from All India Radio

Received Shri Kuttachan Memorial best farmer Award of KVK, Idukki

## Description of innovation

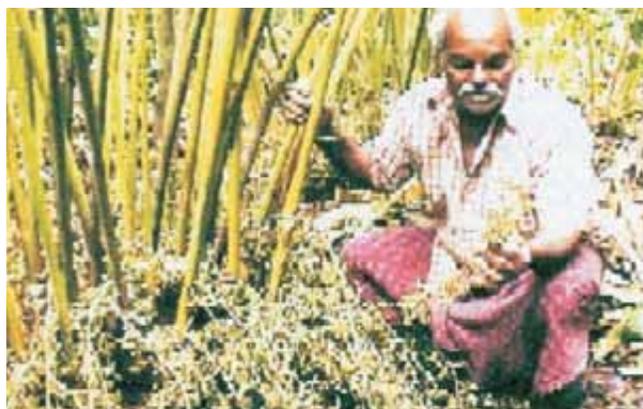
*Thiruthali*-a landrace and an ideotype with excellent growth has yield potential of 4 tonnes/ha with economic life period of 15 years. It has high resistance to pests and diseases, especially root grub and is moderately tolerant to *azhukal* disease. It has 6 ft panicles. On an average, it gives 4 panicles/tiller with profuse flowering and seeding. Another attractive feature of this variety is branching of panicle.

## Practical utility of innovation

High incidence of pests and diseases drastically reduces yield of cardamom. High yielding varieties grown by the farmers are prone to pests and diseases. *Thiruthali* variety developed by the farmer is high yielding with inherent pest and disease resistance. It is easily propagated through vegetative growth with tiller multiplication in nursery. This variety has been widely adopted by cardamom planters. *Thiruthali* is being cultivated by about 1,000 farmers in 2000 ha.

## Variety Development Process

High-yielding cardamom varieties *Njallani*, *Malabar* type and *Vazhukka* were planted in a pit with an isolation distance of 5 km. Seeds were collected after allowing for natural hybridization. Raised 1,000 seedlings from these seeds. Selected 500 healthy seedlings and transplanted to main field. Observed plants for 3 years. Marked plants with high yield attribute having 6 feet length of panicle with an average of 4 panicles/tiller, profuse flowering and seeding. Observed identified plants closely for another 5 years. Plants had consistently shown high yield, with increased resistance to pest and diseases, especially root grubs.



Thiruthali



# Annona 2, NMK 1– Custard Apple Selections

## Shri Navnath Malhari Kaspate

A/P Gormale, Taluq Barshi, District Solapur, Maharashtra  
(Mobile : 09822669727, e-mail: nmkaspate@yahoo.com)

### Profile

Age	: 55 years
Education	: 11 std
Landholding	: 14.4 ha
Farming experience	: 32 years
Crops grown	: Custard apple, grape and mango
Livestock	: Deshi cows and backyard poultry

### Recognition

President of Maharashtra State Custard Apple Production, Training and Research Board, Pune

Director of Solapur Grape Growers Association, Solapur



### Description of innovation

Shri N.M. Kaspate started custard apple farming 18-20 years ago for reducing production cost in farming as well as to enhance sustainability to maximize productivity. He developed two selections from his custard apple museum. Annona 2, NMK 1. These selections possess high keeping quality of mature fruits with quality pulp. He promoted 10 feet x 15 planting distance in medium soils comparing 16 x 16 feet that was recommended by State Agricultural University for development of microclimate in orchard for enhancing pollination.

### Practical utility of innovation

The selections, Annona 2 and NMK 1 are suitable for all types of soils for plantation with a distance of 10 feet x 15. He did thinning for getting good number and quality fruits i.e. keeping 100-125 fruit/plant at the age of 8-10 years. Fruits of these selections are very attractive in colour and in size, have less number of seeds per fruit, and berry is quite big. Because of the special characteristics, fruit remains in good condition (un-ripped) for at least 20-25 days on the plant itself. Therefore, harvesting time can be adjusted according to the market demand and cargo facilities. The harvesting of NMK1 can be done 2-3 times within 20-25 days as per the market convenience.

The productivity of existing varieties with traditional cultivation is about 10 to 12 t/ha. And productivity of these selections is about 15-19 t/ha with 70-80% grade-1 fruits. Due to good quality fruits production, the market rates are 120-150% more over existing cultivars. This benefit-cost ratio is 4.6. Near about 700-800 farmers from 9-10 districts of Maharashtra have gained benefit with these selections. Area under custard apple has increased to more than 800 ha in Solapur district and approximately 450 ha in the adjoining districts during the last 8-10 years.



# Tilak Chandan-Rice Variety

**Shri Devnath Verma**

Village & P.O Prem Nagar (Gadarpur), District Udham Singh Nagar, Uttarakhand  
(Mobile : 09412136064)

## Profile

Age	: 63 years
Education	: Intermediate
Landholding	: 6 ha
Farming experience	: 35 years
Crops grown	: Cultivation of paddy, wheat and sugarcane
Cropping system	: Paddy-wheat-sugarcane
Livestock	: Cows (2- cross bred) and buffaloes (2)

## Recognition

Recipient of best farmer award by the ATMA, Chairman of Jaivik Krishak Samiti

## Description of innovation

*Tilak Chandan* is an aromatic dwarf type of rice variety, with brown coloured tip of lemma with awns. It takes 100-105 days for panicle initiation. The grain width is medium and decorticated grain shape is short bold, with medium amylase content in the endosperm. Variety is good under organic farming condition. It is fairly resistant to bacterial leaf blight, and is a purified landrace of rice. This variety was selected on the basis of uniformity in plant type, height, flowering and seed shape and other morphological characters. For *Tilak Chandan*, the reference variety was *Bimdli*, which is also an aromatic rice line and also grown in this area.

## Practical utility of innovation

Area is increasing owing to farmers' acceptability. It is a good aromatic variety with relatively harder stem. Fewer incidences of diseases and lodging are reported. *Tilak Chandan* is moderately resistant to neck blast disease.



Field performance of rice-*Tilak Chandan*



## Aromatic Rice-Hansraj

### Shri Arun Kumar Kamboj

Village Chakarpur, P.O Bazpur, Block Bazpur,  
District Udham Singh Nagar, Uttarakhand  
(Mobile: 09897049791)

#### Profile

Age	: 53 years
Education	: High school
Landholding	: 6 ha
Farming Experience	: 35 years
Crops grown	: Cultivation of paddy, wheat and sugarcane
Cropping system	: Paddy-wheat-sugarcane
Livestock	: Cows (4 crossbred) Buffaloes (4)

#### Recognition

##### Recipient of

National Innovation Foundation Award for energy harvesting from decomposed bio-waste in 2009

Best farmer award by the ATMA in 2010

Special farmer award by best practices for organic farming in Uttarakhand hills by Uttarakhand Organic Product Parishad in 2009

Second prize in zonal sugarcane competition in 2009 by Ganna Vikas Parishad, U.S.Nagar

#### Description of innovation

Aromatic tall variety of rice has been developed from mass selection by the farmer which has potential for export as basmati rice. The variety is tolerant against bacterial leaf blight. This variety is a purified landrace of rice. It was selected on the basis of the uniformity in plant type, height, flowering and seed shape and other morphological characters. It takes 110 days for panicle initiation. Grain is long, cylindrical with elongation ratio of 1: 1.7. The grain width is medium and decorticated grain shape is long, with medium amylase content in endosperm.

#### Practical utility of innovation

Area is increasing owing to farmers acceptability. It is a good aromatic variety, preferred by exporters under organic basmati. *Hansraj* attracts premium price in the market. Under organic farming condition, it yields 20 tonnes/ha. This requires less fertilizer compared to other high-yielding varieties. With high fertility, yield gets reduced owing to lodging.



Field performance of aromatic rice variety  
- *Hansraj*



# Varietal Innovation for Sustainable Crop Production

**Shri Chandra Shekhar Singh**

C-26/31, Jagatganj, Ramkatora Road, District Varanasi, Uttar Pradesh

(Mobile: 09454751419)

## Profile

Age	: 54 years
Education	: M.A., L.L.B.
Landholding	: 1.6 ha
Farming experience	: 34 years
Crops grown	: Sugarcane, potato, wheat, paddy and vegetables
Cropping system	: Paddy-wheat-mung, Dhaincha (GM)-potato/pea-sugarcane
Livestock	: Cow: 2 (Gangatiri)

## Recognition

### Recipient of

Progressive farmer award, IARI-2008  
Best farmer stall award-2008 of the IARI  
Best farmer stall award-2009 of the IARI  
Chief speaker award-2008 of the IARI  
Appreciation award, IARI  
2nd Green Revolution Sammelan award-2007  
Chandra Shekhar Kri Vid Upadhi, CSA, 2007

## Description of innovation

Shri Chandra Shekhar Singh developed variety of paddy namely Khusbu 1S in 2004. It is a short duration variety, which matures in 120 days with yield performance of 5.0-5.5 tonnes/ha. He also developed pigeonpea (*Vasundhara Badshah*) in 2003. Pigeonpea variety gives 50% flowering at about 120 days 242 pods per plant, and its 100 seeds weight is 11.2 g colour and plant type is compact. 3.0-3.2 tonnes/ha and it matures in about 230 days and its seed is being bought by farmers @ Rs 100 per kg. Besides, he has developed number of wheat varieties Baba Vishvanath, Kashi Vishvanath, Ganeshan, Devnandan. Shri Singh is distributing these varieties seeds to farmers of Uttar Pradesh and other states. The Wheat Baba Vishvanath yielded the 6-6.5 tonnes/ha.

## Practical utility of innovation

The certified and foundation seeds are produced by the farmer and are being sold to farming community. About five lakh farmers have been benefited by these innovations Uttar Pradesh and the country. Pigeonpea variety *Vasundhara Badshah* is wilt-resistant, of compact plant type and its seeds are in demand in the district and neighboring areas. The seeds being available locally, are to farmers advantage.



Field performance of *Vasundhara Badshah*



Profuse podding of *Vasundhara Badshah*



# Artificial Pollination in Pointed-gourd

**Shri Ajay Mandali**

MV-8, District Malkangiri, Odisha

(Mobile : 09438022045)

## Profile

Age	: 38 years
Education	: 6 std
Landholding	: 4 ha
Farming experience	: 26 years
Crops grown	: Paddy, groundnut, greengram, pointed gourd, sesame and vegetables
Livestock	: Buffalo and cow

## Description of innovation

Developed a technique for artificial pollination in pointed-gourd by planting male plants in separate beds. Artificial pollination was done by plucking male flowers, removal of petals, collection of pollens by hammering with a wooden stick in a glass, diluting with water, sieving using a net and pollinating female flowers by putting a drop of solution using dropper. In rainy season, plucking of male flower buds is done in the afternoon, and they are kept overnight in water and plants are pollinated in the morning when the weather is favourable.

## Practical utility of innovation

Yield is 2.5 times higher when artificial pollination is practised . Gross return is Rs 100,000 per acre with an additional cost of Rs 18,000 towards labour cost for artificial pollination( 5 persons/ family-members/children @ 1.5 hours per day per acre required for pollination). Fruit setting is better, size is good and weight of the fruit is more 70%, 18-20 fruits weigh one Kg.



Plucking and soaking of flower buds



Preparation of pollen solution



Pollinating female flowers



# Ananda Sagar : A regular bearer of Mango Graft

**Shri Ananda Garnayak**

Kureibahal, Tainsar, Purunagarh, District Deogarh, Odisha

(Mobile : 09438679189)

## Profile

Age	: 69 years
Education	: Matriculate
Landholding	: 18 acres
Farming experience	: 45 years
Crops grown	: Mango, litchi and greengram
Livestock	: A pair of bullock and three cows

## Recognition

### *Recipient of*

Best farmer award of the district-2009 from the Hon'ble Chief Minister of Odisha

Participated as a progressive mango grower in the State Level mango festival, 2009, at Bhubaneswar, organized by Directorate of Horticulture, Odisha.

## Description of innovation

Shri Garnayak collected the scion of the one of the rare at species of mango from Bamanda king's orchard and grafted it. He named the new plant with his own name as Ananda Sagar. This graft of mango is a regular fruit bearer, and its bearing starts from the main branches, emerging from the trunk. It ripens after 2<sup>nd</sup> week of July till mid August, and is sold at double the rate.

## Practical utility of innovation

Ananda Sagar is non fibrous, juicy, tasty and its ripening period coincides with demand of mangoes in the market. This grafted variety is superior to its contemporary varieties Fazli, Neelam. It is sold at about double rate, and the market demand is also high. There is a need of its popularization and Mr Garnayak has a plan to do it by establishing a small nursery.



Ananda Sagar emerging from main branches



Anada Sagar mango tree full of fruits



# Innovative Okra Breeding

**Shri Swapan Mandal**

Village Bhabanipur, Block Haringhata, District Nadia, West Bengal

## Profile

Age	: 55 years
Education	: Matriculation
Landholding	: 2 ha
Farming experience	: 38 years
Crops grown	: Jute, paddy and vegetables

## Recognition

Secretary of Farmers' Club

## Description of innovation

A wild line of okra with hard skin, long hails and resistant to YVMV was identified by Sri Swapan Mandal. He observed performance of the wild variety for three years, and decided to incorporate the trait of resistance against YVMV in the commonly grown Pusa Sawani. Pusa Sawani was selected as female for improvement following backcross method with an aim to interspecific transfer of simply inherited character of YMV resistance. In this method 1st generation breeding line was developed in 2007. Following the same technique, 4th generation breeding line was developed along with a sizeable quality of seeds of new breeding line of okra.

## Practical utility of innovation

Okra yield is reduced owing to acute YVMV problem (30%). In this innovative breeding by backcross method, the yield of okra increased up to 9 tonnes/ha. Moreover, infestation of YVMV recorded as low as 3-4%. The quality of okra has also been improved for higher market price. Seeds are being used in the district, particularly in the vegetable growing areas and provided same results.



Wild okra plants



Backcrossing in okra



Okra after successful cross



# Alternate Approach for Sapota Propagation

**Shri Harulal Mandal**

Village Srikrishnapur, P.O Sukdevpur, District South 24 Parganas, West Bengal  
(Mobile : 09733217226)

## Profile

Age	: 35 years
Education	: Matriculation
Landholding	: 1 ha
Farming experience	: 38 years
Crops grown	: Paddy and fruits
Livestock	: Duckery in paddy fields

## Recognition

Used as master trainer for KVK

## Description of innovation

Fallen sapota plants are used for grafting in this alternate method. In fallen plants, scion branches of pencil thickness remain nearer to around helping into non-hanging of rootstock upon the tree. Hanging of a rootstock (in a mud ball) on a large and high tree is not only labour intensive, but also costly affair. Grafting in fallen tree is easy and around 2,000 to 2,500 grafts can be prepared from a single plant per season. Observing the ease of making grafts, orchard growers have started felling sapota plant artificially/mechanically by digging one side of the plant and by cutting few roots. After felling tree, rootstock of *khimi* seedlings (in mud ball) are placed on the soil by the side of the pencil thickness branches of sapota mother-plant. Mud ball of *khimi* seedlings are placed within the soil by making small holes. In this way, a grafter can make 250 to 300 graft unions in a day. After removal of graft unions, mother plants are erected, properly nourished and then again made to fall in the opposite side to complete cycle of two grafting in a year.

## Practical utility of innovation

In this method, 4200 grafts per year can be produced with a profit of Rs 16,110 and 2.59 B:C ratio. In non-grafted plants, profit is only Rs 850 per year as the cost of seedling is 50 paisa against Rs 6.25 in the grafted seedling. This technique was first applied in Srikrishnapur village of the district by the group of farmers and now it is practised by the farmers of Amtala-Bishnupur region—the main nursery area of the district.



Grafting of sapota



Grafted sapota



# Innovative Mango Sapling Production

**Shri Hazi Sk. Yasin**

Village & PO Baharal, PS Ratua, District Malda, Maharashtra  
(Mobile : 09733217226)

## Profile

Age	: 61 years
Education	: Graduate
Landholding	: 18 acre
Farming experience	: 42 years
Crops grown	: Paddy, mango and vegetables
Livestock	: Poultry and duckery

## Recognition

Secretary of Farmers Ghosthi

## Description of innovation

In the conventional method of vegetative propagation of mango like inarching, two to three years old mango seedlings are attached to tertiary branches of mother plant for 2-3 weeks and then removed from mother plant and placed either in tubs or in soil for their growth. Waterlogging and livestock trespassing often damage seedlings farmers incur losses to a great extent. In this innovative way, farmers produce saplings in full grown tree by hanging it from the tree with an earthen tub. The seedlings are allowed to hang up to two years to attain 5-6 feet height. During excessive rain, tubs are covered by polythene jacket to store excess water for making surrounding cool.

## Practical utility of innovation

The grafted seedlings in this method are sold in the market at a high price. In this method, seedlings are saved from all external threats like scavenging by animals, theft etc. Moreover, seedlings are saved from flood and water stagnation also. As the seedlings are separated at mature stage, this survivability increases considerably.

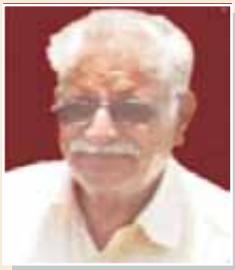


Mango grafting



THEMATIC AREA 2

**CROP PRODUCTION**



# In-situ Trash Composting

**Shri Subhash Divanchand Karir**

A/p Hasnapur, Taluq Rahata, District Ahmednagar, Maharashtra

(Phones. : 02422-273511, 09271940320)

## Profile

Age	: 62 years
Education	: Diploma (Engineering)
Landholding	: 4.8 ha
Farming experience	: 35 years
Crops grown	: Sugarcane, wheat, soybean and maize
Livestock	: Cows (200 ), buffaloes (100 ) and backyard poultry

## Recognition

Vice President of Farmers' Club

Member of Block Technology Team (Rahata)

Member of ATMA, Ahmednagar

## Description of innovation

Shri Subhash, a member of Innovative Farmers' Club, established by KVK, Ahmednagar, during 1996 has developed a method of in-situ trash composting. In ratoon sugarcane, he placed trash in between cane rows and then applied on spot chemical fertilizers in the form of briquette, 10-15 cm near the cane stumps followed by 10-12 tonnes of press-mud on the trash. After 15 days, 10kg decomposed microbial culture mixed with cow-dung was applied on trash and irrigated with sprinkler irrigation for 2 to 3 months. With the help of special type of tool called *Pahar* trash was placed. This tool is made from the porous MS pipe having 2 inch diameter and 5 feet length. The lower side of the pipe is pointed. The round MS plate was fitted 15 cm above the bottom side of the tool so that the placement is at 10 to 15 cm in the soil.

## Practical utility of innovation

The technology developed by the farmer is adopted by the sugarcane growers in the district as well as of the state. More than 250 farmers adopted trash mulching over 450 ha in the KVK operational area. The technology is economically viable, it reduces fertilizers cost by 35%. Further, it saves irrigation and increases yield of ratoon sugarcane from 80 tons to 95 tonnes per ha. Its benefit cost ratio is 3.92.



In-situ trash composting in ratoon sugarcane



Farmers observing in-situ trash composting



# Exotic Vegetables' Cultivation

**Mrs Vanita Murlidhar Gunjal**

At/post Kandli, Taluq Junner, District Pune, Maharashtra

(Mobile : 09860226085)

## Profile

Age	: 40 years
Education	: 8 std
Landholding	: 3 ha
Farming experience	: 25 years
Crops grown	: Exotic vegetables
Livestock	: Cows and buffaloes

## Recognition

Recipient of Prof. N G Ranga Award from ICAR for diversified farming

Member of SHG and Mahila Mandal

## Description of innovation

Mrs Vanita searching market for traditional vegetables got an idea of cultivating Chinese Vegetable. She searched some literature on Chinese Vegetable and found demand of this vegetable in Five Star Hotels in Mumbai. Based on the demand, she started cultivation of different exotic vegetables parsley, red cabbage, broccoli, Leek, cherry tomato, etc. and could achieved sustainable income from farming. She searched markets for these vegetables, and sold produce very effectively.

## Practical utility of innovation

Demand-driven exotic vegetables production is suitable for the farmers as they have assured market through contract with consumers. Exotic vegetables market is growing at the rate of 15 to 20% per annum is increasing day by day since India is importing more than 85% exotic vegetables. The innovative woman farmer is growing 25 vegetable varieties in 2.2 ha with an expenditure of Rs 6250/day/ha and obtained earnings Rs 8750/day/ha. Skilled labour is required for cultivation of these vegetables. Presently, a group of 100 farmers is cultivating these exotic vegetables from different villages in the vicinity.



Exotic vegetables cultivation





# Easy Line Planting Technique in Rice Cultivation

**Shri Jibon Kishor Nath**

Village Bashbari, P.O North Baitamari, District Bongaigaon, Asom  
(Mobile : 09854973914)

## Profile

Age	: 40 years
Education	: 12 std
Landholding	: 8 ha
Farming experience	: 20 years
Crops grown	: Rice, vegetables, coconut, arecanut, and pineapple
Livestock	: Dairy animals and chara chameli ducks

## Recognition

Secretary of Pathar Parichalona Samiti

Treasurer of Pathar Unnayan Samitee

## Description of innovation

Easy Line Planting Technique in rice cultivation developed by Shri Jibon Kishor Nath, of Bongaigaon District consists of two parallel rows of ropes and they are tied to bamboo pieces in both the sides with small pieces of coloured plastic tag at equidistance, and the seedlings are transplanted in the main field. This is not generally practised in farmers' fields as it is time consuming and labour expensive.

## Practical utility of innovation

The total cost of cultivation is Rs 15,500 per ha under modified line sowing method against Rs 16,200 per ha with the normal line sowing practice. Benefit was cost ratio under modified method and under normal practice was 1.5 and 1.41. In comparison to the existing method, this technique saves labour and time to a great extent. The percentage of adaptability of the technique is 25%.



line sowing technique in rice transplanting



# Paired-row concept for Cultivation of True Potato Seed

**Shri Rajmohan Debnath**

P.O Sonatala, District West Tripura, Tripura  
( Mobile: 09863626475)

## Profile

Age	: 52 years
Education	: 7 std
Landholding	: 3.5 Kani
Farming experience	: 34 years
Crops grown	: Potato, rice, tomato, brinjal, cabbage, chilli, ridge gourd, amaranthus and pumpkin
Livestock	: Cows

## Recognition

Member of Sonatala farmer club

## Description of innovation

Paired-row concept for cultivation of True Potato Seed (TPS) is the innovation in which. TPS are sown in narrow inter space of 10 cm  $\times$  10 with 5 cm for plant-to-plant distance. A total of 100 plants per m<sup>2</sup> were maintained in all cases. Two methods, transplantation and seedling tuber were used for producing of potato using TPS.

## Practical utility of innovation

This innovation is less laborious than a single row system, which need more time. Very high level of seedling maintenance is the major utility of this concept. Overall adoption is about 66% among potato-growers of West District of Tripura.



Paired row land preparation



TPS crop through paired-row planting



# Cost Minimization in Mushroom

**Shri Sushanta Naik**

Village Kandabahal, P.O Bhedabahal, District Sundargarh, Odisha

(Mobile: 09776775959)

## Profile

Age	: 37 years
Education	: 12 std, ITI
Landholding	: 4 ha
Farming experience	: 17 years
Cropping Pattern	: Paddy-groundnut-vegetables
Livestock	: Dairy (3 crossbred cows)

## Recognition

FAC Member, ATMA, Sundargarh

## Description of innovation

The developed a mushroom unit with humidity and temperature control facility and started preparing small paddy straw mushroom beds with only 3-kg straw, and did not use polythene sheets to cover beds; unlike traditional beds, which require 10-15 kg straw, costing Rs 20, one bottle of spawn costing Rs10 and polythene sheets costing Rs 4. Instead of pulse powder (*besan*) 250g, costing Rs 7.50 per bed as medium for mushroom cultivation, he formulated a mixture of *choker* + *chanachuni* in of 60:40 and used 150 g of this costing Rs 2.50 per bed. These two innovations mixed together gave good economic benefits significant and cost saving.

## Practical utility of innovation

With this innovation, fruiting time reduced by 3-5 days, polythene cost reduced by Rs 4 /bed, saving on food media Rs 5/bed and on straw Rs 16 . Using 2 bottles of spawn, 3 beds could be prepared, thereby, saving Rs 3/bed. Traditional method yielded 1.5 kg mushroom using 15-20 kg paddy straw, but innovative method yielded 400-500 gms using only 3 kg straw and straw-use efficiency was around 15% in innovative method as against less than 10% in traditional method.



Innovative (3 kg straw)  
uncovered bed of 8 days



Innovative mixture of *choker* + *chanachuni*  
(60:40)



# Watermelon Transplanting Technique

**Shri Monoj Kumar Pradhan**

At Bhejimal, G.P Bandhapathar, Block Harabhanga, District Boudh, Odisha  
(Mobile : 09937110582)

## Profile

Age	: 38 years
Education	: B.Sc.
Landholding	: 7.2 ha
Farming experience	: 15 years
Cropping Pattern	: Paddy, greengram, watermelon, brinjal, pumpkin, cabbage and cauliflower
Livestock	: Cows (10)

## Description of innovation

Shri Pradhan noticed high percentage of mortality of watermelon seedlings in early stage in traditional method of sowing. He also noticed that owing to slow growth of seedlings, weeds grow rapidly, which reduced yield drastically. The raised seedling of watermelon in poly bag in the backyard and transplanted them in the pit in the main field (with earth ball intact) after 15 days of sowing.

## Practical utility of innovation

Mortality in traditional seed sowing was 23% while it was 6% in sowing seeds in polybag. Thus it is economical for farmers who use hybrid seeds which are otherwise costly. Besides, weed population was reduced owing to faster growth of plant in the later stage. And it is easy to take care of young seedling in the backyard than in the main field, which is labour and time saving.



Sowing of seed in polybags



Transplanted watermelon in main field



# Intercropping Onion with Cabbage

**Shri Davinder Singh**

V. P. O. Nakodar, District Jalandhar, Punjab

(Mobile : 09872440130)

## Profile

Age	: 38 years
Education	: Matric
Landholding	: 0.72 ha
Farming experience	: 20 years
Crops grown	: Cauliflower, chillies, cabbage, tomato, cucumber, onion, potato and napier bajra
Livestock	: Dairy animals

## Description of innovation

Generally farmers grow cabbage and onion separately. But Shri Davinder Singh invented technology of intercropping cabbage with onion. In this practice, cabbage was transplanted in December and onion was transplanted in the 2<sup>nd</sup> week of January. Seed rate for cabbage was 375 g/ha and for onion @ 2 kg/ha. The cabbage was transplanted on both sides of beds of size 2 feet. The difference between consecutive beds was also 2 feet. The onion was transplanted in lines 15 cm apart in between cabbage lines. He used only 30 kg/ha urea in two split doses of 15 kg each through the drip lines. He applied weedicides, and only two manual weedings were done in the field.

## Practical utility of innovation

The farmer obtained about 300 tonnes/ha of cabbage (no yield reduction) and onion crop yield was the additional.



Intercropping onion with cabbage



# Chrysanthemum Nipping

**Shri Mallappa Shivappa Halli**

Post Lakkundi, Taluq and District Gadag, Karnataka

(Mobile: 09901415783)

## Profile

Age : 48 years  
Education : PUC  
Landholding : -  
Farming : 26 years  
experience

## Recognition

President of Organic Farmers' Association,  
Lakkundi village, Gadag block

Chrysanthemum is an important flower crop grown in Lakkundi cluster of villages in Gadag block of the district in Karnataka. It is being cultivated in about 1500 ha covering 12 villages. Nipping of terminal shoot is an important agronomic practice in *Chrysanthemum* to encourage growth of side suckers to get more flowers. The University of Agricultural Sciences, Dharwad, recommends nipping of terminal shoot by hand when sucker attains 15 cms height. Farmers are of the opinion that this method is not yielding desired results as sufficient number of suckers are not developed. This problem has been overcome by innovated improved method of nipping as it increases more number of side suckers.

## Description of innovation

Shri Mallappa Halli of Lakkundi village in Gadag district has improved method of nipping in *Chrysanthemum* for enhancing growth of side suckers for higher production. It is the method of heading back whole terminal shoot with sickle after 45-60 days after planting instead of just nipping terminal shoot as is recommended by the University of Agricultural Sciences, Dharwad, increasing number of side suckers.

## Practical utility of innovation

Improved method of nipping resulted in 25-30% increased flower yield (10 tonnes/ha) as compared to existing method (8 tonnes/ha) which gave an additional income of Rs 40,000/ha. It reduced incidence of sucking pest and diseases, reduced cost on pesticide, ensured more suckers and improved quality of flowers. This method is cost-effective and can be adopted very easily by the farmers. This method is widely practised by the farmers Gadag district. Improved quality of flowers fetched better price flowers.



*Chrysanthemum* with improved  
method of nipping



# Onion Cum Coriander Leaves Production Technology

**Shri Indrasan Kushwaha**

Village Ajirma, Post Raghavpuri, District Surguja, Chhattisgarh

(Mobile : 08103368996)

## Profile

Age	: 50 years
Education	: Primary School
Landholding	: 1.5 acres
Farming experience	: 30 years
Crops grown	: Maize, wheat, okra, cucurbits, onion, coriander, sweetpea, cabbage, cauliflower and other seasonal vegetables
Livestock	: Dairy cattle

## Recognition

Member of Farmer's Cooperative Society

## Description of innovation

Farmers grow onion as a sole crop, but Shri Kushwaha sowed one row of multi-cut coriander along the border of onion plot. He received 2-3 kg green coriander leaves from small size of 3mx4. plot. Thus, this combination harvest of 2.5 to 4.0 tonnes/ha as companion crop with onion gave an additional income of Rs 15,000/ha.

## Practical utility of innovation

There is shortage of coriander leaves in the market during late winter. Thus growing of multi-cut coriander hybrid variety along the border of onion beds can successfully give the 2.5 to 4.0 tonnes of leaves/ha without hampering growth of main crop. This innovation provides additional income without involving much cost. This is an ideal example of getting recurring benefit with amicable adjustment of companion crop without affecting profitability of main crop.



Multi-cut coriander on the border of onion (main crop)



# Relay Cropping in Vegetables Cultivation

**Shri Hrushikesh Giri**

Village Gopalpur, Block Bonth, District Bhadrak, Odisha

(Mobile : 09937780101)

## Profile

Age	: 51 years
Education	: M.A., M. Phil
Landholding	: 10 ha
Farming experience	: 35 years
Crops grown	: Jute, paddy, vegetables and pulses

## Recognition

Governing board member of the ATMA, Bhadrak

Member of Farmers Club

Organising Secretary of Jagannath Memorial Trust, Bhadrak

## Description of innovation

In the relay cropping in vegetables, vegetables cultivation is followed from October to May (eight months). In the beginning two or more crops of different durations are cultivated in the same field. When vegetable of shorter duration is harvested second vegetable gets better space to grow. When second vegetable enters fruiting phase, a third vegetable is planted, and like wise with modified principles of mixed and relay cropping the farmers took 3 to 7 crops in same patch of land over a period of 8 months.

## Practical utility of innovation

The innovated model of relay cropping not only achieved scientific objective of crop management but also gave higher returns to farmers through relative advantages in space and time utilization, particularly when the proportion of up/medium land for vegetable cultivation is less. The utility of such model cropping also covers risk of uncertainty, enhances utilization of natural (land, water) and external (fertilizer, pesticide) resources as well as some times support eco-friendly crop management practice (e.g. the allopathic effects of garlic reduces disease chance in other crops in the same field). This practice reduces cost of cultivation and increases net returns from the same piece of land. The main utilities in this model are continuous flow of vegetables to market from the same piece of land.



Giri explaining Agricultural Production Commissioner, Government of Odisha



Cabbage-Maize-Pumpkin together on the same land



# Innovative Sugarcane Cultivation

**Shri Jiblal Yadav**

Village Chehal, P.O Sarmatanr, Block Jainagar,  
District Koderma, Odisha

## Profile

Age	: 80 years
Education	: Illiterate
Landholding	: 12 acres
Farming experience	: 60 years
Crops grown	: Sugarcane, paddy, and vegetables
Livestock	: Poultry and piggery

## Recognition

Advisor to farmers

## Description of innovation

In this cane is cut into 2-3 pieces from the top and made in to bundle of 100 sets. Rest of the cane is used for jaggery purpose. A trench of 1-1.5 feet deep and sizable length and width is prepared in the field to place bundle of sets in the soil for sprouting. Ash and 10% Malathion or BHC or kerosene oil is applied in the surface of the trench in a single layer of bundle. The sets are covered with leaves and with trench soil. Irrigation is given after two days with cow-dung and mixture of Malathion dust and kerosene oil. After 2 weeks, sprouted sets are taken out and planted in a furrow by *desi* plough at about 1.5 feet (line-to-line) by end-to-end method. Sprouted sets are again treated either with Malathion or kerosene oil. While placing the sets, some soil is powered on the set by hand. After completion of planting procedure, planking is done.

## Practical utility of innovation

This method helps farmer save at least 2 weeks time, which can be utilized for making jaggery as well as for field preparation. Moreover, uniform set-setting is observed with higher yield and minimum insect-pest infestation. Farmers of entire Jainagar Block are practising this unique method in sugarcane.



Canes collection



Placing canes



# Sunflower Plant for Staking Tomato

**Shri Mahendra Sahu**

Village Amagawa, Post Peri, P.S Simariya, District Chatra, Jharkhand

(Mobile : 09931529250)

## Profile

Age	: 52 years
Education	: Graduate
Landholding	: 6 ha
Farming experience	: 31 years
Crops grown	: Paddy, wheat and sunflower
Livestock	: Poultry

## Recognition

Member of Farmers' Organization

## Description of innovation

More fruits in tomato leads to breaking of branches and falling of the entire plant causing nearly 40% of fruits damage. Tomato plants need staking for bearing fruits till harvesting. Mainly small pieces of sticks are used for this purpose. Sticks are made either from tree branches or bamboo. In this, seeds of sunflower are sown near the root zone of tomato after 20 days of transplanting. Tomato plants come into bearing after 55-60 days of transplanting when sunflower plants become healthy for stacking tomato plants.

## Practical utility of innovation

This alternate method of stacking does not require any additional input for which the entire process is affordable by the farmers. Cultivation of sunflower alongwith tomato increases the cropping intensity as well as provide additional income to the farmers. It has been observed that sunflower as stacking material performs better than sticks in keeping tomato plants erect.



Staking tomato by sunflower



# Short Duration Banana Ratooning

**Shri Ram Sharan Verma**

Village & P.O Daulatpur (Jaitpur), District Barabanki, Uttar Pradesh  
(Mobile: 09839376028, e-mail: vermaagri@gmail.com, Website www.vermaagri.com)

## Profile

Age	: 40 years
Education	: 9 std
Landholding	: 2 ha
Farming experience	: 20 years
Cropping systems	: Banana-potato-tomato- <i>mentha</i> , banana-potato-tomato- <i>dhaincha</i> (green manuring), paddy-wheat- <i>mentha</i>
Livestock	: Cattle (1) Buffalo (1)
Other enterprises:	Vermicompost Unit 1, NADEP Compost Unit 1, modern nursery and supply of tissue-culture banana saplings

## Recognition

### Recipient of

Sri Jag Jeevan Ram Purashkar 2007 of ICAR

Uttar Pradesh Gaurav Puraskar 2008

Ch. Charan Singh Award 2007

Pragatisheel Kisan Samman 2007

Udhyan Pandit Puraskar 2006

Best Farmer Award 2006

Mentha Production Purashkar 2006

## Description of innovation

Shri Ramsharan Verma is able to determine banana crop needs by simply observing symptoms and status. In 1990, he started banana cultivation on 2.40 ha personal land and today plantation is spread across 36.0 ha on leased land of the fellow farmers. Tissue culture banana plantation at 1,100 plants per acre with a distance of 6'x6' has been perfected by him. Per plant expenditure comes around Rs 60-70 and gross income is of Rs 300. One of the technique perfected in managing banana plants is cutting of plants at neck height after first harvest and reducing fertilizer application to half against recommended doses. This practice hastened crop harvest by two-and-half months. Secondly, the standing tree provided food to suckers at much higher rate as could be synthesized by suckers for growth and development. The observations indicated about 10 kg per plant higher fruiting than the plots from where the trunks were removed from the base of the harvest. Thereby additional gain of about Rs 1.00 lakh per ha was attained. The farmers earned Rs 4.40 lakh/ha from banana cultivation.

## Practical utility of innovation

The consultancy services are rendered by Shri Ram Sharan Verma to other farmers to enhance their living standards. He provides information regarding seed, fertilizer, crop cycle and modern instruments. He is harnessing 20% extra production from every crop. About 15,000 farmers/ Govt/Non-Govt officials visit his farm every year. About one lakh farmers have adopted his innovation. He is providing employment to 50,000 persons per year and his turnover is Rs 1 crore per year.



Farmers interaction at banana field



Tissue culture Banana

Short-duration banana ratooning



# Peach Based Farming System

**Shri Rajpal Singh**

Village Jagaita, P.O Fendpuri, Block Nakur, District Saharanpur, Uttar Pradesh

(Mobile: 09412558235)

## Profile

Age	: 50 years
Education	: Graduate
Landholding	: 7 ha
Farming experience	: 20 years
Crops grown	: Brinjal, chilly, okra, mango, peach, litchi and wheat
Cropping systems	: Peach+brinjal + chili Peach + cucumber - cucumber - blackgram - spinach
Livestock	: Cow: Jersey (3) Buffalo: Murrah (2) Mushroom, beekeeping and vermicompost units

## Recognition

*Felicitated by*

NHM for quality fruit production.

KVK for organic farming.

Khadi and Gramodyog Commission for beekeeping

First prize by NRC on Litchi for Litchi cultivation

## Description of innovation

Shri Rajpal Singh has introduced peach based system for the first time in the district an alternative to sugarcane dominated cropping system in the district. Three horticulture + vegetables based systems are practised in 4 ha. They are peach (Saharanpur prabhat) + Brinjal (Navkiran) + chilly (AK 47); Peach (Saharanpur prabhat) + spinach (rajdhani) and Peach (Saharanpur prabhat) + Cucumber-cucumber (Alamveer) - black gram (PU 35). Peach based system peach + cucumber-cucumber-blackgram-spinach provided highest net profit of Rs 3.43 lakh/ha, followed by peach+brinjal+chilly of Rs 3.39 lakh lakh per ha.

## Practical utility of innovation

Horti-vegetable system provides cash flow throughout the year as compared to sugarcane based system where farmers get returns after one year. The system is sustainable and there is no problem of marketing. This system adopted by farmer is profitable and is being used as a model for other farmers and extension personnel. The system is environment-friendly and provides higher returns.



Interaction with farmers



Peach based system



# Alternate Year Pruning in Roses

**Shri Gopal Krishan Saini**

Mohalla Choudharan, Makarandnagar, Near Rajshri Talkies

District Kannauj, Uttar Pradesh

(Mobile: 09936986805)

## Profile

Age	: 54 years
Education	: Post Graduate
Landholding	: 1.6 ha
Farming experience	: 30 years
Crops grown	: Rose, mehandi, bela, chameli and marigold
Cropping system	: Maize-potato-latesown Wheat/ sunflower/ greengram/ blackgram Bela-potato Marigold-maize
Livestock	: Buffalo (1)

## Recognition

SAC Member of KVK

## Description of innovation

Training and pruning of crop is one of the most important practices which influence flower production significantly. In roses, this practice is recommended each year during mid December to mid January in which farmers get 120-140 q/ha flower yield per year. But Shri Gopal Krishna Saini has adopted an innovative practice of "alternate year pruning". In this practice, the crop is trained and pruned one year and kept unpruned in second year. Through this practice, second year crop gives higher number of branches and flowers. Shri Saini is achieving 120-130 q/ha flower yield in first year after pruning and 240- 260 q/ha yield in second year from this practice. The innovative practice has reduced the pruning cost and doubled the yield of flowers with additional economic gain of Rs. 2.70 to 3.00 lakh in two years.

## Practical utility of innovation

This technology is cost effective and more remunerative in the areas like Kannauj where distillation of flowers is commercially done for extracting essence and its marketing. The farmers could save the money and increase his profit.



Each year pruning of rose



Crop view at alternate pruning of rose



## Cost Effective Shade Net House

**Shri Jagannath Gangaram Tayade**

A/P Ladsavangi, Taluq & District Aurangabada, Maharashtra

(Mobile : 09421313616)

### Profile

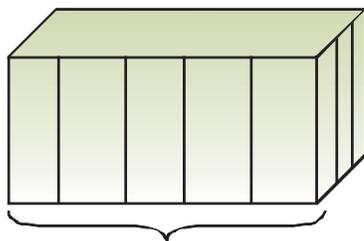
Age	: 50 years
Education	: 10 std
Landholding	: 7.2 ha
Farming experience	: 27 Years
Crops grown	: Cotton, maize, sweet orange seed production of capsicum, tomato and water melon
Livestock	: Cow and buffaloes

### Description of innovation

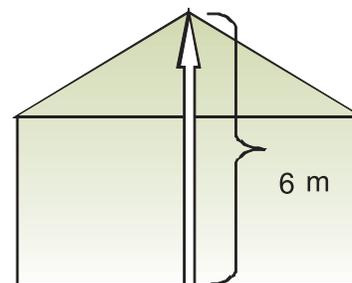
Shade net house was developed by Shri. Jagannath Tayade from locally available iron material. Total height of the shade net house is 6m from center place, Length is 36 m and width is 24 m. The shade net house requires wire ropes. Here the obstacles within shade net are negligible which helps for smooth intercultural operations and easy movement of labour as compared to recommended one.

### Practical utility of innovation

This type of shade net house is suitable for growing heighted crops like capsicum, tomato, chili, etc. This shade net house sustains wind speed up to 80 km/hr and is economically viable as the total cost required to construct is Rs 60000 which become 30% less than the recommended technology and rain water is drained easily due to doom shape structure. At present 15 farmers had adopted this type of structure on 0.10 ha each and are taking seed production programme of capsicum and tomato.



Recommended shade net



Farmer shade net



THEMATIC AREA 3

## CROP DIVERSIFICATION



# Additional Crop of Rajmash with Tomato

**Shri Nain Prakash**

Village Bari Katrain, P. O Manali, District Kullu, Himachal Pradesh

(Mobile : 09817081382)

## Profile

Age	: 41 years
Education	: Middle
Landholding	: 1.6 ha
Farming experience	: 25 years
Crops grown	: Wheat, oat, maize, rajmash, sarson, tomato, pea, potato, garlic, apple, and pomegranate
Livestock	: Cattle, sheep and goat

## Recognition

Executive Member, Upper Valley Fruit Grower Association

## Description of innovation

Sowing of trailing (indeterminate) varieties of rajmash or beans along the tomato rows either at first earthing up or at the time of first fruit picking. If sown early it behaves as inter crop but sowing is done along the earthed up ridge, not in the inter row space. When sown late it behaves as relay crop. The trailing legume uses the same staking as prepared for tomato as indeterminate tomato varieties are cultivated in the area.

## Practical utility of innovation

Rajmash being the legume grows better under drought and adds towards the soil fertility and uses the same staking which is erected for tomato. Thus, it uses the natural resources more efficiently and crops do not compete for resources. Under favourable conditions tomato gives benefit cost ratio ranging from 3.5 to 4.0 with additional yield of 8-12 q/ha of rajmash without any extra cost of cultivation.



Additional crops of Rajmash with Tomato



# Jhaar Karela-A Selection of Wild Bitter Gourd

**Shri Dalip Singh**

Village Kothe Ramsar, P.O Dhilwan Kalan, Kotkapoora District Faridkot, Punjab

(Mobile : 09417929149)

## Profile

Age	: 45 years
Education	: Matric
Landholding	: 4 ha
Farming experience	: 32 years
Crops grown	: Wheat, paddy, basmati, chilli, cauliflower, cucurbit, kinnow and jamun
Livestock	: Cattle and poultry

## Recognition

Vice-president of Vegetable Growers Association, Faridkot

## Description of innovation

A local type of bitter gourd known as 'Jhaar Karela' is found climbing on bushes in sandy area as a wild plant. It is known for its medicinal value for diabetic patients. This farmer has adopted the wild cultivar and brought it under commercial cultivation. He has collected the seed from a wild plant growing as weed from south-western districts of Punjab. He had even travelled to Rajasthan to collect the seed. He made the selection and developed a variety of his own. He has been growing 'Jhaar Karela' for the past 5 year on an acreage of 0.5-1.5 ha annually. It is a vine type crop and requires staking for successful cultivation. Mr. Dalip Singh has developed a system of bamboo staking on concrete foundation to trail the vines.

## Practical utility of innovation

He is getting an average yield of 75 qtls/ha from the crop. He had been marketing the produce himself with his own conveyance. He made a packing size of 1, 2 and 5 kg and sold them in the adjoining markets. The average price of his produce (2009-10) was Rs. 5000/- per qtl and thus from an area of 1 ha, he earned Rs. 375000/- as gross income. With net return of about Rs. 200000/- per ha.



Bamboo staking of wild bitter-gourd vines



Harvested produce from Jhaar Karela



# Crop Diversification with Oil Palm

**Shri P. Subba Rao**

Village Remalle, Bapala Padu (Mandal), District Krishna, Andhra Pradesh  
(Phones: 9848509326, 08654-242003)

## Profile

Age	: 67 years
Education	: Matriculation Rashtra Bhasha Praveena (Hindi)
Landholding	: 4.5 ha
Farming experience	: 48 Years
Crops grown	: Rice, cotton, chillies, groundnut and oil palm
Livestock	: Buffaloes (12), back yard poultry and vermicompost

## Recognition

Sarpanch, Remalle Village (1981-87)  
President, Krishna District Oil Palm Farmers Welfare Association. (1992-94)  
Member AP State Agriculture Development Board (1994).  
President AP State Oil Palm Farmers Welfare Association (1995- 2008)  
President National Oil Palm farmers Association (2008 till Date) etc.

## Description of innovation

Shri P. Subba Rao an innovative farmer diversified the crops like rice, cotton and chilli in red loamy soils having filter points as irrigation source to oil palm cultivation. Introduction of inter cropping with groundnut in oil palm facilitated him to achieve an additional income in the early stages of oil palm up to 5 years. He saved 30 per cent of irrigation water through drip irrigation. A substantial increase in girth of oil palm was observed while using vermicompost @ 50 kg/palm in two split doses at 6 months interval besides an increased yield of 20 per cent as compared to the farmers who applied chemical fertilizers.

## Practical utility of innovation

Groundnut was grown as an inter crop in the early stages of oil palm up to 5 years using sprinkler irrigation. An average yield of 30 q/ ac was recorded. The additional income realised from groundnut helped the farmer to meet the expenditure towards maintenance of oil palm garden till the bearing of productive bunches. The innovative practice of inter cropping groundnut in oil palm motivated the farmers to raise other crops like chilli, vegetables in early stages of oil palm. Drip irrigation is adaptable and increases water use efficiency there by decreasing the cost of irrigation. The farmers can save 30 per cent of irrigation water besides fertigation. Weed infestation around the base of the palm was found to be low. An average yield of 8 t/ac was recorded as compared to flood irrigation (4-5 t/ac) done by other farmers. The residue of groundnut crop was used for the preparation of vermicompost. Application of 50 kg of vermicompost helped in increasing girth of the palm and weight of bunches. With the service and guidance rendered by Shri P. Subba Rao, Remalle village, Bapulapadu Mandal, Krishna District the oil palm cultivation has gone up to 3500 ha in red loamy soils of Krishna District under filter points.



Oil palm with bunches

# Pomegranate Promoted Crop Diversity and Sustainability



## Shri Hanumat Bhanudas Gajare

A/P Aran, Taluq Madha, District Solapur, Maharashtra

(Mobile : 3423332879)

### Profile

Age	: 67 years
Education	: Matriculation Rashtra Bhasha Praveena (Hindi)
Landholding	: 4.5 ha
Farming experience	: 48 Years
Crops grown	: Rice, cotton, chillies, groundnut and oil palm
Livestock	: Buffaloes (12), back yard poultry and vermicompost



Pomegranate crop

### Description of innovation

Mr. H.B. Gajare started pomegranate farming from the year 2001 in 2.80 ha of land, which is shallow rainfed land. Previously he was cultivating Cereals and Vegetables but not getting more income from these crops, then he tried fruit cultivation i.e. Plantation of Pomegranate. Due to shortage of water for irrigation, he changed the cropping pattern and now only Phule Bhagwa Pomegranate for export purpose is grown by him. Every year there is increasing trend of income and specially during January, 2009, 60 tons of Pomegranate @ Rs. 62 per kg. has been sold. Out of total production 70% produce has been exported to the European country. The total expenditure for 1.2 ha was Rs 300000 while the total income of Rs 3720000 has been obtained by him. Mr. Gajre developed good agricultural practices for pomegranate like refilling of Borewell with rainwater harvesting every year, use of Azotobactor, Rhizobium and PSB. He used Dashparni ark to control insects and pests in order to have minimum level of pesticidal residues. To increase fruit weight, improve colour and quality of fruits the Biological products i.e. Madhulexin @ 7 ml. / litre of water is sprayed at 21 days before harvesting. The special pruning practices, integrated nutrient management and integrated pest & disease management practices are followed. Presently these practices are followed on 700 to 750 acre by the farmers of Aran cluster.

### Practical utility of innovation

He is giving knowledge about Pomegranate cultivation and group dynamics to other farmers through Shri Babanrao Shinde Krishi Phalotpadak Sahakari sanstha, Aran which was established during 2006. Through this co-operative sanstha they purchased fertilizers, pesticides and marketing activities were implemented. During 2001, the area under pomegranate was only 1.7 ha while in 2010 it is about 280 to 300 ha which gave 150 to 175 % more yield and Benefit Cost Ratio is 11.4. He formed pomegranate growers group with 40-50 members and marketing is being done through this group.



# Sustainability Through Crop Diversification

**Patil Vishwasrao Anandrao**

Post Lohara, Taluq Pachora, District Jalgaon, Maharashtra  
(Phones. : 02596- 272240, 0257-2233325, 9763475764)

## Profile

Age	: 65 years
Education	: M.A.
Landholding	: 31.25 ha
Farming experience	: 33 Years
Crops grown	: Rainfed sugarcane, urdbean, soybean, maize, gram, wheat, cotton, mungbean and jowar
Livestock	: Buffaloes(12), back yard Poultry and vermicompost

## Recognition

Council Member of Bharat Krushak Samaj, New Delhi

Member of Extension Council of Mahatma Phule Agricultural University, Rahuri (M.S.) (from 2001-2005)

## Description of innovation

Before 1998 the agriculture production was totally dependent on pesticides and chemical fertilizers. Due to this cost of production was more. Slowly yield began to reduce in all crops and health of the soil found deterioration in fertility status and physical characters. The soil became hard, difficult for cultivation, labour problem arised. It gave a ray of thought to find alternative farming system. Mr. Patil read lot of books, had discussion with successful organic farmers and took decision to shift from chemical to organic agriculture.

The decision was very tough and risky but as an innovative farmer, with full confidence he started organic agriculture which has a spiritual depth, created by Rishis in the ancient times. He followed crop rotation, with pulse crops, Inter Crop/Mix cropping pattern, Trap cropping for Insect and Disease management; Mulching, Integrated nutrient management, Use of PSB, Rhizobium, Azotobactor, Green Manuring, developing own seed bank, evolving ITKs, use of Vermi Compost and use of Earth worms, Irrigation management always in saturated point, use of silt from river, nala, basins and MI tanks, use of wind breaks of Bamboo plants from 18 years. Sheep & Goat penning in the farm regularly in summer, recycling of agro bio-mass through composting, In situ moisture conservation.

## Practical utility of innovation

The crop yields are not only maintained but increased. The cost of production has reduced by 40% especially the cost of chemical fertilizers and pesticides have come to nil. Results of organic practices especially for Sugarcane and Mosambi was excellent in yield as well as quality also. The keeping quality and taste was good. He gets higher price in the market. Organic cultivation has been certified by Eco-cert through Nisarg Sheti Mandal, Jamner. This Mandal has exported organic Jaggary to Europe prepared from organic sugarcane. He exported organic cotton to Japan. Farm is recognized as 'Organic farm'. Large no of farmers from Maharashtra, Madhya Pradesh, Govt. Officials and Local Officers also visited the farm. This farm has proved that organic farming works for all crops in drought prone situations.



# Gladiolus as Intercrop with Sugarcane

**Shri Dheer Singh**

Village Noonikhera, P.O Ghatain, Block Jansath, District Muzaffarnagar, Uttar Pradesh  
(Mobile : 9759847691)

## Profile

Age	: 56 years
Education	: Graduate
Landholding	: 2.5 ha
Farming experience	: 32 years
Crops grown	: Potato, sugarcane, gladiolus and wheat
Cropping system	: Sugarcane-Gladiolus
Livestock	: Cow: Jersey (2) Buffalo: Murrah (2) Bullock: (2)

## Recognition

1<sup>st</sup> prize for sugarcane cultivation by KVK  
President of Dairy Society

## Description of innovation

Muzaffarnagar is the main sugarcane growing area. Cost of cultivation of sugarcane is increasing day by day and net profit is decreasing. Gladiolus has been introduced as intercrop on ridges as additional crop without disturbing the population of sugarcane in furrows and has been found to be profitable. Gladiolus is planted in the month of October on ridges as additional crop and the spikes are harvested upto February. The bulbs are left in the field for one month for hardening and removed in the end of March. This intercropping gave a net profit of Rs. 3.08 lakhs per ha as compared to Rs. 0.93 lakh of sole crop. The average yield of intercropped sugarcane was 1000 q/ha in addition to 150000 spikes, 75000 bulbs and 5q bulblets of gladiolus from 1.0 ha land.

## Practical utility of innovation

Gladiolus as additional intercrop may be planted in the month of October with autumn sugarcane and is feasible in the district because of marginal and small land holding.



Gladiolus on ridges intercropped with sugarcane  
var. COS-8436



Farmer harvesting spikes of Gladiolus



# Banana Intercropping with Sugarcane

**Shri Ram Kishan**

Village Baseda, P.O Baseda, District Muzaffarnagar, Uttar Pradesh  
(Mobile : 09917360723)

## Profile

Age : 46 years  
Education : Graduate  
Landholding : 2 ha  
Farming experience : 26 years  
Crops grown : Sugarcane, wheat, banana and vegetables  
Cropping system : Sugarcane- banana  
Livestock : Cow: cross bred (3)

## Recognition

State level first Prize for Diversification in 2004  
District level first Prize in Organic farming in 2008-09  
District level prize for SHG in 2007  
District Progressive Farmer

## Description of innovation

Shri Ram Kishan planted sugarcane variety COS-8432 in April and intercropped with banana variety Nanden/Hari Chhal in July in 6:1 row ratio accommodating 950 plants of banana per hectare. Crops were fertilized with 350 q/ha FYM and 180:80:160 NPK per ha with 25 kg/ha Zinc. Banana intercropped with sugarcane is more profitable (Rs. 2.67 lakh/ha) in comparison to sole crop of sugarcane (Rs. 0.85 lakh/ha). The average yield of sole sugarcane was 800 qt/ha while 500 qt sugarcane and additional 300 quintal yield of Banana with this technology.

## Practical utility of innovation

Intercropping of Banana in Sugarcane was found profitable with late spring Sugarcane. It is feasible in the district because of marginal and small land holdings.



Banana intercropping with sugarcane



Banana bunch with sugarcane crop



# Enhancing Guava Production Through Canopy Management in Summer

**Sri Gulab Maurya**

Village Kadipur Post Imelo, Block Dharmapur, District Jaunpur, Uttar Pradesh

(Mobile : 09918120227)

## Profile

Age	: 44 year
Education	: Intermediate
Landholding	: 1.8 ha acre
Farming experience	: 20 years
Crops grown	: Guava orchard, potato, brinjal, tomato, chilli, cauliflower early rice and wheat
Livestock	: Cow: Jersey (1) Buffalo: Murrah (1) Bullocks (2)

## Recognition

Guava Orchard award  
Award for organic farming  
Progressive farmer award by KVK

## Description of innovation

In old and dense guava orchards the production was reduced drastically due to poor orchard management practices and improper rejuvenation technique i.e. hard and semi hard pruning in the month of December and May. The farmers were not able to get economic yield up to one and half years and also involved the risk for drying of some plants. Mr. Gulab Maurya innovated pruning technique instead of hard and semi hard pruning. Refinement was done by using light canopy management in summer only .

## Practical utility of innovation

By using light canopy management in summer along with cultural and nutritional management, farmers are getting more number of bearing and quality produce up to 40-50% and gain of Rs. 35000-42000/ha. as additional profit. Over pervious technique of guava rejuvenation, 16 more guava orchard farmers are adopting light summer pruning technique in the district.



Flowering and fruiting after summer pruning



Healthy fruiting



THEMATIC AREA 4

## CROP PROTECTION



# Panchagavya-A Bio-pesticide

**Shri Umesh Sood**

Village Bashing, P.O Babeli, Tehsil/District Kullu, Himachal Pradesh

(Mobile : 09816254302)

## Profile

Age	: 45 years
Education	: M.A. (Economics)
Landholding	: 15.4 acres
Farming experience	: 20 years
Crops grown	: High value vegetable and fruit crops

## Recognition

Convener of Bharat Vikas Sangum

Advisor of District Organic Organization

## Description of innovation

500 ml Panchgavya (milk, curd, ghee, dung and urine of cow) + 150-200 ml extract of Ritha fruits and Neem leaves [ 50 ml Neem leaves extract + small quantity of gur + fermented wheat flour + 100 ml extract of Ritha] + 300 ml cow urine (collected earlier) to make 1 lt biopesticide. Apply 1 lt/100 lt of water 30-45 days after transplanting.

## Practical utility of innovation

The product exhibits action against insects as antifeedant, growth regulator, fecundity suppression and sterilization, oviposition repellency or attractancy, changes in biological fitness, and weaken the pests. All the ingredients of this bio-pesticides are natural and available on farm, eco-friendly, economically viable and leading to sustainable production system as a whole. It is a low cost and environment friendly bio-pesticide.



Process of bio-pesticide preparation



# Vermicompost Sieve

**Shri Brijesh Vishwakarma**

Village Jatwa, Block Panagar, District Jabalpur, Madhya Pradesh

(Mobile : 0930038612)

## Profile

Age	: 27 years
Education	: Post Graduate
Landholding	: 2.8 ha
Farming experience	: 7 years
Crops grown	: Paddy, and vegetables
Livestock	: Small dairy

## Recognition

President of Hari Om Vermiculture Society

## Description of innovation

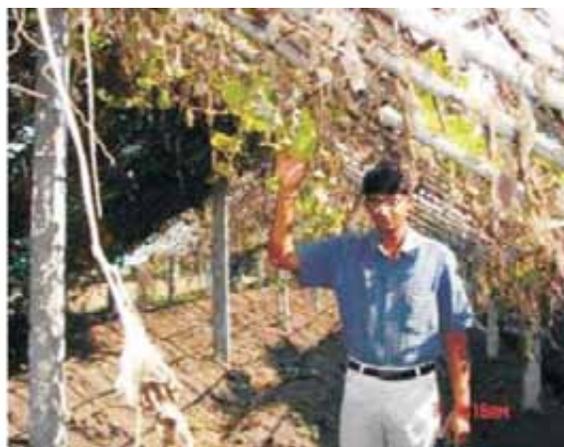
Vishwakarma established a vermi-compost unit in which he get converted the farm and animal waste into quality vermicompost by using worms without constructing permanent structure and floor (used ground open surface by making of heaps). He also utilizes the space between shades for cultivation of cucurbits which helps to protect the worms from sunlight besides giving additional income and developed a hand operated device for sieving of vermicompost without damaging the worms.

## Practical utility of innovation

Minimize the input cost in making of floor and structures. It become easy and feasible for farmer, hence any farmer can adopt the same technology without much investment and efforts. Farmers can earn an additional income from cultivation of cucurbits.



Sieving Machine



Cultivation of cucurbits space between shades



# Yellow Sticky Pot Trap

**Laxmidhar Mohanta**

Village Basudevpur, Block Sadar, District Keonjhar, Odisha

## Profile

Age	: 52 years
Education	: Matriculation
Landholding	: 2 ha
Farming experience	: 33 years
Crops grown	: Paddy, brinjal, okra, tomatoto and cucurbits
Livestock	: Poultry, goatery, piggery and duckery

## Recognition

Secretary of Grama Krusaka Mancha, Basudevpur

## Description of innovation

Developed yellow sticky pot trap by using locally available material i.e. earthen pot and mahua oil (*Madhuca Indica*). The outer part of the earthen pot was painted with enamel yellow paint and smeared with mahua oil. The pot was placed with wooden tag in the field @ 20 numbers per ha. The colour attracts insects and sticks to the pot due to stickyness of mahua oil.

## Practical utility of innovation

The performance of yellow sticky pot trap is at par with the trapping efficiency of white fly to commercial yellow sticky trap. It is cheaper, easy to prepare and eco-friendly; which controls significantly the viral diseases like little leaf in brinjal, leaf curl in tomato, YVMV in okra and mosaic in cucurbits, Further, it solves the problem of market unavailability of commercial trap.



Yellow sticky pot trap in Okra field



Yellow sticky pot trap in tomato field



# Sing Ki Khad and Amrut Pani

**Dr Shiv Shankar Choure**

Village Rajoor, Tehsil Khalwa, District Khandwa, Madhya Pradesh

(Mobile: 098266 57176)

## Profile

Age : 60 years

Education : BHMS (Homeopath Doctor)

Landholding : 7.2 ha

Farming experience : 15 years

Cropping pattern : Cotton+ soybean and wheat+ gram

Livestock : 6 animals

## Recognition

President of NGO Sankalp Biotech Society, Rajoor

## Description of innovation

**Sing ki Khad (Compost of Horn):** Dr. Choure has 40 horns of cow. He fills cow dung of milking cow on Nav Durga in Kunwar month in these horns and buries for six months. After that, infinite bacteria developed in this compost. He has applied 30 g of this compost in one acre by preparing solution in water and spraying in the field with the help of sweep in moist condition . It has given very good results in soybean and cotton crops. Afterwards, these horns were filled with silica quartz stone powder and same procedure was applied for next six months. Spray of thus processed powder @3 g in one tank of sprayer will work as an excellent tonic for all the crops.

**Amrut Pani :** 5 kg cow dung of milking cow in a “Matka” along with 3-4 litre of cow urine and 100-150 ml honey or 250g gud. This solution is kept for six days for better fermentation and then sprayed in field which works as a growth enhancer.

## Practical utility of innovation

Sing ki khad is being prepared and supplied by Dr.Choure to the farmers and is very popular among farmers as basic nutrient supply and tonic to the crop. Some of the farmers have come forward for making such compost.

Amrut Pani, innovated by Dr. Choure is, now, being practiced by many farmers of Khandwa for Chilli & Cotton crop. It gives instantaneous crop growth.



Dr. Choure with his exhibition of Bio-products in a Kisan Mela



Explaining the bio-products to District Collector & M.L.A.



# Leaves Decoction as Bio-pesticide

**Shri Anand Singh Thakur**

Village Umariya Khurd, Post Doodhia, Tehsil & District Indore, Madhya Pradesh  
(Mobile: 09301301901)

## Profile

Age	: 36 years
Education	: M.A. (Political Science)
Land-holding	: 8 ha
Farming experience	: 10 years
Crops grown	: Soybean, maize, arhar, vegetables, wheat, gram, potato, garlic and onion,
Livestock	: Dairy with farming

## Recognition

*Treasurer of*

Bhartiya Kisan Sanghathan, of Indore district

Recipient of highest soybean productivity achiever in 2003 from SOPA

## Description of innovation

Shri Anand Singh Thakur has developed a bio-pesticide. It is decoction of different type of leaves and other bio-materials, The components used were 5 kg leaves of Neem, Pongamiya, Custard apple, Ipomia, and Caiotropsis gigantia(Commonly known as Madar) [1 kg each] + 250 gm Garlic (mashed) +10 litre water + 10 litre Cow urine. He boiled it till it remains half of the total quantity (approx. 10 litre) and filtered. This decoction of 10 litres is dissolved in 600-700 litres of water and applied (sprayed) for 1 ha.

## Practical utility of innovation

Decoction is very simple to prepare and use. All the components are easily available at village level free of cost. Use of this bio-pesticide is very good to control the insect-pest (sucking pest, leaf feeders, etc.) of soybean and other crops. The use of this bio-pesticide does not harm beneficial insects and it helps the farmer to reduce the cost of cultivation also.



Visit of Foreigners



Farmers visit



# Technique to Reduce Contamination in Mushroom Spawn Production

**Sri Sanjeet Kumar Mohanty**

Village Jaisapatna, P.O Pipili, Distt. Puri

(Mobile: 9437278721)

## Profile

Age	: 33 Years
Education	: M.A (Economics) Diploma in Agri-Business
Landholding	: 6 AC
Farming experience	: 5 years
Crops grown	: Paddy, vegetables and mushroom
Livestock	: Cow and poultry

## Recognition

Guest faculty for APICOL

Secretary of Farmer's club (Jai Kissan) at Jaisapatna, Pipili (Odisha)

## Description of innovation

Disinfection of the inoculation chamber floor using heating torch connected with gas cylinder with spirit spray and camphor for 15 minutes. Disinfection is done in two days interval in rainy season and weekly interval in other seasons. Culture transfer is done above gas lamp instead of spirit lamp to reduce the cost of spawn production. Rs 60 is spent towards LPG for culture transfer instead of Rs 3000 in using spirit for producing 45000 spawn bottles (each bottle has a capacity of 200 gm spawn) over a period of 3 months. Thus there is a saving of Rs. 2940 per three months. Cotton of contaminated bottle are reused after sterilization in the autoclave at 15lb pressure at 121°C for 15 min.

## Practical utility of innovation

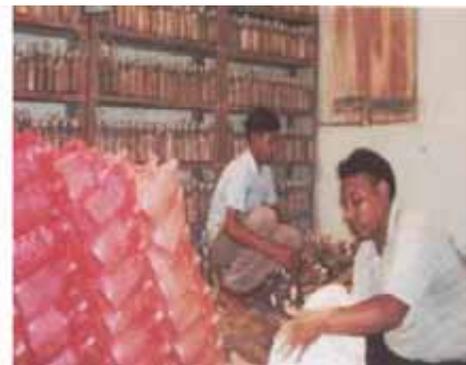
After adopting the above technique the contamination of the spawn bottle was reduced from 25% to 3%. We could get an additional income of Rs. 29250 per month after following the above technique.



Disinfection of the inoculation chamber wall with heating torch with spirit spray



Disinfection of the inoculation chamber floor with heating torch connected with gas cylinder



Packing of the mushroom spawn bottle



# Red Ants for Control of Tea Mosquito

**Shri N. Vasavan**

Kizhakkambath House, Post Kottayampoyil  
Pathayakunnu, District Kannur, Kerala (Mobile : 09847871575)

## Profile

Age	: 54 years
Education	: 6 <sup>th</sup> class
Landholding	: 7 acres
Farming experience	: 35 years
Crops grown	: Cashew, coconut, areca nut, pepper, banana, tuber crops, upland paddy
Livestock	: Dairy and poultry

## Recognition

Director (PP), NABARD-KVK Federation of Farmers clubs, President of Samrudhi farmers club, North Malabar Gramin Bank.

## Description of innovation

Red ant colonies are established in cashew garden by bringing the colonies from other trees to cashew and connecting the trees with jute or plastic ropes to facilitate ant movement. Pieces of meat or fish should be kept in the other end of rope in the tree which needs to be invaded. Ant colonies should be kept in the evening time and provide food in the form of pieces of meat or fish for successful colonisation.

## Practical utility of innovation

Red ants (*Oecophylla smaragdina*, Hymenoptera) attack nymphs of tea mosquito, eggs and even adults and control the pest effectively so that no pesticide application was needed in the gardens with ants' invasion. This innovative way of biological agents (red ants) gave 100% control over tea mosquito. It is highly effective, safe to environment, no need of repeated application, no expenditure towards labour. Farmer states that they got Rs 5.47 from a rupee invested on this, whereas return from pesticide application was Rs. 1.59 for one rupee invested.



Red ants served as biological agents against tea mosquito in cashew crop



## Rat Control Method in Coconut

**Shri S.R. Arun Kumar**

Shettikere, Taluq Chikkanaikanahalli, District Tumkur, Karnataka  
(Phones. : 08133-269564, 09900824420)

### Profile

Age	: 33 years
Education	: B.Sc (PCM)
Landholding	: 9 acres
Farming experience	: 11 years
Crops grown	: Coconut, arecanut, cocoa, vanilla, pepper

### Recognition

Member in BAIF, Farmers Association, Shettikkere

### Description of innovation

Developed method of rat control includes an old bamboo basket, binding wire, plastic thread, snap trap and desiccated coconut pieces. An old bamboo basket is tied at four corners with binding wire. All these four binding wires are connected to a single plastic thread and put on a coconut frond which can be pulled up or down. Desiccated coconut piece is attached to a snap trap and placed inside the bamboo basket. Rats get attracted to desiccated coconut and they get locked inside the trap. Dead rats are removed and buried in the soil so as to prevent the spread of diseases.

### Practical utility of innovation

Rats damage tender coconuts as well as arecanuts. Existing rat control measures are not cost effective. The innovative farmer is using 25 units in an area of 8 acres. Developed method catches 15-25 rats daily and 3000 to 4000 nuts saved from damage from 8 acres. This method is eco-friendly and low cost. Around 300 farmers have adopted this method in their coconut gardens and 1000 rat scissors/traps have been sold at Krishi Mela, GKVK, Bangalore at the rate of Rs. 35 per trap.





# Bordeaux Mixture-Spraying Technique

**Shri P. Kumara Pernaje**

Village Muddur, Post Pernaje, Taluq Puttur, District Dakshina Kannada, Karnataka

(Mobile : 08251-289163)

## Profile

Age	: 42 years
Education	: Intermediate
Landholding	: 3 ha
Farming experience	: 30 years
Crops grown	: Arecanut, coconut, cocoa, banana, pepper, cashew, ananas
Livestock	: Desi cows

## Recognition

Member of SHG

## Description of innovation

Innovative spraying technique of Bordeaux mixture consists tying one thread to pumping handle and other end tying coconut shell with a small stone inside. It looks like bell shaped with a long thread tied to the handle. When solution is pumped, coconut shell immerses inside solution and thoroughly mixes the solution. This is very important action need to be done, otherwise the pump will spray only diluted solution and thick portion may settle down at bottom. So this methodology helps in spraying thoroughly mixed spraying solution which will be effective in controlling disease.

## Practical utility of innovation

Spraying of Bordeaux mixture for controlling Koleroga disease is age old practice but still holds good. Farmers normally take up 2-3 times spraying the same chemical after first rain. Modified spraying method of Bordeaux mixture not only saves one skilled labour (\*250/day) but also mix the solution thoroughly. Farmers in the surrounding villages have adopted modified method of spray in their arecanut gardens.



Modified spraying technique



# Stethoscope-Now in Agriculture

**Shri Chakradhar Pradhan**

Janhapada, Block Attabira, District Bargarh, Odisha

(Mobile : 09861697336)

## Profile

Age : 52 years  
Education : 7 std  
Landholding : 2 ha  
Farming experience : 39 years  
Cropping Pattern : Paddy, vegetable farming, lemon orchard, coconut, ginger and turmeric

## Recognition

Awarded by International American Agency 'Trees for Life'

## Description of innovation

In medical science stethoscope is generally used to detect the heart beat of human beings and animals. Now it is used in agriculture sector by Shri C. Pradhan. The "Root borer" pest inside the plant could be detected through stethoscope. One can easily able to hear the cutting sound of the pest by keeping the stethoscope on the outer region of plant. It requires keen attention and a little patience. Accordingly the needful curative measures like uprooting, soil drenching with pesticides are taken after detection of pests for protection of the affected plants.

## Practical utility of innovation

Stethoscope is used to detect the "Root borer" pest inside the plant. As a stethoscope is available in cheaper price (Rs 400/- only) and simple to operate, one farmer can easily use this. The farmers will definitely be benefited by practising this innovative method. They will easily find out the pests inside the affected plant by stethoscope. Then the pests can be controlled by taking the timely curative measures. Hence, now the use of stethoscope in plant sector is highly appreciated and widely accepted by the farmers.



Use of stetho to identify root grub affected plants



# Low Cost Practice for Control of Case Worm in Paddy

**Shri Bhupen Singh**

Dalapchand Busty, PO Dalapchand, Kalimpong II, West Bengal  
(Mobile : 08101215689)

## Profile

Age	: 27 years
Education	: Matriculation
Landholding	: 1.2 ha
Farming experience	: 6 years
Crops grown	: Paddy, maize and pulses
Livestock	: Poultry and cattle

## Recognition

Known as advisor in the society

## Description of innovation

In this method a rope of desired length is fully soaked into kerosene and run by two persons from both ends of the paddy field over the standing crop with adequate care that almost all the plants are shaken by the rope. Rice case worms are fallen down in the stagnant water and immediately the water is drained out. These worms are washed out of the paddy field with the flow of water. Kerosene oil acts as repellent to drive away the pests.

## Practical utility of innovation

Requirement of this technique is height of the paddy plants of 1-1.5 ft, stagnated water in the paddy field, kerosene oil and coconut fibre rope. The success of this innovation depends on the ability to shake the standing paddy plants without making them lodged. The innovation is fully eco-friendly as it does not require any chemical. However, the timing of application of this technique is crucial as the proper stage of caseworm attack needs to be identified and accordingly the technique should be applied. Over matured stage of paddy may lead to lodging as well as shattering of grain.



Preparation for soaking cotton



Close view of case worm



Draining out water



# Chaur Soil for Cauliflower Seed Production

**Shri Bindeshaw Pd. Singh**

Village Hariharpur, Post Rajauli, Hajipur, District Vaishali, Bihar

(Mobile : 09835271511)

## Profile

Age	: 72 years
Education	: Illiterate
Landholding	: 7.5 ha
Farming Experience	: 53 years
Crops grown	: Oilseeds, maize and pulses, vegetables
Livestock	: Piggery and cattle

## Recognition

Member of Farmers Club

## Description of innovation

Replacing the top soil of land (306 cm) with *chaur* soil during summer and before cultivation of cauliflower for seed production was the key to innovative seed production technique. The replacement of soil reduced the oxidation of organic matter besides increasing the nutrient and water holding capacity. With this practice nearly 580 kg/ha cauliflower seeds were produced, nearly 47% more than the traditional practice.

## Practical utility of innovation

Existing soil was not suitable for cauliflower seed production. The soil being heavy in nature reduced water holding capacity besides enhancing oxidation of organic matter. The soil of *chaur* area had the quality of reduced oxidation of organic matters and water holding capacity conducive for cauliflower seed production. The method needed only transportation cost of soil. The method is being practiced in nearly 100 ha of Vaishali district exclusively for vegetable seed production.



Chaur soil



Performance of cauliflower



# 'Amulya Amrit' for Pest and Disease Management

**Shri Surya Prakash Bahuguna**

Village & P.O Haripur, Near Harbertpur, District Dehradun, Uttarakhand

(Mobile : 09412147702)

## Profile

Age	: 48 years
Education	: Graduate
Landholding	: 4.8 ha
Farming experience	: 20 years
Crop grown	: Maize, vegetable pea, wheat, paddy, mungbean, urdbean, rajma and okra
Cropping systems	: Maize-veg. pea-wheat Paddy-wheat-summer mungbean/urdbean Paddy-rajma-okra
Livestock	: Cow: 12 (4 cross bred)

## Recognition

Best Farmer Award by Department of Agriculture, Uttarakhand

Secretary of Farmers' Field School

## Description of innovation

A mixture of cow urine (5 litre), cow milk (0.5 litre), curd (0.5 litre), honey (200 g), green banana (5), coconut paste (1 coconut) and Ghee (50 g) are kept in sealed container. This mixture is kept in shade covered with wet gunny bag for three days. After three days, the gunny bags are removed and the container is opened to release the gas and stirred with stick. After stirring and releasing the gas for another 3-4 days, the fermented solution is filtered through muslin cloth. This solution is named as "Amulya Amrit" and used effectively against foliar fungal diseases and *Lepidopterous* borers in rice, mango, litchi, wheat, etc. The farmer is using one litre mixture in 5 litre of water in above crops for last 5 years.

## Practical utility of innovation

This mixture is used against foliar diseases in paddy, pulses, oilseeds and vegetables. It is very effective in these crops as compared to use of conventional insecticides. If this is used at lower level of incidence then further multiplication of diseases are checked.



Use of Amulya Amrit improves quality and production



Amulya Amrit ready for use



# Seed Bio Priming for Early Germination in Cucurbits

**Shri Narayan Singh Rawat**

Village & P.O Gwaldam, Block Tharali, District Chamoli, Uttarakhand

(Mobile : 09568505973)

## Profile

Age	: 50 years
Education	: High school
Landholding	: 0.5 ha
Farming experience	: 10 years
Crops grown	: Paddy, wheat, ragi, potato and other vegetables
Cropping system	: Paddy-wheat-ragi-fallow  Summer squash / tomato – chilly / capsicum- cabbage
Livestock	: Buffalo (2)

## Description of innovation

In the mid to mid-high hills, it is very difficult to germinate the seeds in the Poly-tunnel up to February due to low temperature. The farmer places the cucurbit seeds tied in muslin cloth bag in raw cow dung heap for 5-6 days in last week of January. The heat and moisture of cow dung compels the seed to germinate early. Then these germinated seeds are sown in poly-bags and these poly-bags are also buried in raw cow dung up to 1/3 to 1/2 of the length. Poly-tunnel is also covered over the heap. This practice leads to early germination of cucurbit seeds in the month of February and is transplanted in the first to second week of March under open field condition when the chances of frost is over.

## Practical utility of innovation

Other farmers of nearby areas, are also using the technology for early season cucurbit production. It is highly feasible for early production of cucurbitaceous vegetables under mid to mid-high hill condition, where low temperature in late winters inhibits cucurbit seed germination.



Placing cucurbit seeds tied in muslin cloth in raw cow dung heap



Sowing of bio-prime cucurbit seeds in poly bags



THEMATIC AREA 5

**FARM MACHINERY**



# Intertyned Blade of Weed Control in Cotton

**Shri Subrat Panigrahi**

Village Anandpur, District Subarnapur, Odisha

## Profile

Age	: 28 years
Education	: B.A.
Landholding	: 11.2 ha
Farming experience	: 8 years
Crops grown	: Cotton, arhar, paddy and green gram

## Recognition

Awarded with best farmer of the district during University Foundation day

## Description of innovation

High cost of weeding coupled with timely unavailability of labour has become the problem for the cotton farmers. Shri Subrat Panigrahi put some idea to solve the weed menace mechanically and designed a blade by taking the help of local black smith. The blade is 45cm length and 10cm width having fair sharpness at the front side. The blade was fitted with two tyne with the help of knot and bolt. While cultivating by using the nine tyne and the intertyne blade there was no weed in the intertyne space. The blade cuts the weed from the ground level and leaves left the grass on the field which acts as mulch. This activity/operation is to be drawn twice at an interval of 15-20 days during initial stage of crop growth. During late vegetative stage the full grown cotton canopy covers the ground and has smothering effect on weed.

## Practical utility of innovation

Mechanical weeding by use of nine tyned cultivator along with inter tyned blade saves Rs 8000 per ha towards weeding. It is very much farmer's friendly, convenient, time saving and easy to adopt. The device can easily be made by the local black smith, which encouraged the farmers to adopt the innovative technology. The farmers are cultivating more than 200 ha of cotton following the mechanical weeding practice and are able to get very good net return.



Locally made intertyned blade



Use of blade in cultivator for weeding



# Disc Bund Maker with Pressing Roller

**Shri Prabhpal Singh**

VPO Kasel, Block Gandiwind, District Tarantaran, Punjab

(Mobile : 09815858510)

## Profile

Age	: 55 years
Education	: M.A (Economics)
Landholding	: 6.9 ha
Farming experience	: 41 years
Crops grown	: Wheat, gram, sarson, berseem, paddy and green gram
Livestock	: Dairy animals

## Recognition

Member of Scientific Advisory Committee, PAU, Ludhiana; Farmers Advisory Committee, GADVASU, Ludhiana

## Description of innovation

The Disc Bund Maker with pressing roller consists of two disc of 67 cms diameter. Each disc is connected with vertical shafts and it sets angle of disc, hence deciding width of bunds. These two disc are joined to horizontal bar which connects both the discs with each other. There is provision of putting weight on each disc by providing a carrier on top of each disc. A pressing roller attached with disc with a spring presses the bunds made by disc and give proper shape to the bunds. It comprises of two heavy disc of 63 cm diameter each and attached to a drum of 20 cm length. The pressure of moving roller is controlled by a screw attached on horizontal bar. It can be linked to any type of tractor. With the pressure and weight of pressing roller, bunds become compact. It is easily adaptable in fields.



Back view of Disc Bund Maker with pressing roller



Side view of Disc Bund Maker with pressing roller



# Sugarcane Seed Setts Cutting Tool

**Shri Gurnam Singh**

Village Landha, Post Saha, District Ambala, Haryana

(Mobile : 09416780402)

## Profile

Age	: 69 years
Education	: Middle
Landholding	: 1 ha
Farming experience	: 40 years
Crops grown	: Wheat, paddy, onion, garlic and sugarcane
Livestock	: Cows and buffaloes

## Recognition

Member of Kisan Club

## Description of innovation

The cutting tool is fitted with very small cutting bar made up of stainless steel with smooth and sharp edge slightly concave in shape bolted to a handle, which is made of G.I.Pipe. At the lower end of cutting tool, a cane holding pipe is provided, which has cut across the length. At one end of cane holding pipe a very small space is left to move the cutting bar inside for complete cutting of cane. The frame is made of angle iron while the seat is made of M.S. Sheet. The leaf spring is made up of high carbon steel which makes it strong and elastic, thereby, resisting the forces applied during its operation.

## Practical utility of innovation

In traditional system of sugarcane planting, the farmers generally use seed of 4-5 bud setts at one time. By using this innovative technology 2 to 3 bud setts can be prepared and good population of plants can be achieved. As mentioned above 12.5 -25 q/ha of sugarcane can be saved. It can be operated both by men and women. It costs only Rs 1100 per tool. Seed requirement per acre is less as compared to traditional method.



Demonstration on Sugarcane Seed Cutter



Sugarcane Nursery in Poly Bags



# Modified Paddy Transplanter

**Shri Didar Singh Dhillon**

VPO Mahalon, District S.B.S. Nagar, Nawanshahar, Punjab

(Mobile : 09815118291)

## Profile

Age	: 65 years
Education	: Diploma in Mech./ Elect. Engg
Landholding	: 9.6 ha
Farming experience	: 42 years
Crops grown	: Wheat, paddy, potato, maize and vegetables

## Recognition

Member of POSCON

## Description of innovation

The float bed of transplanter was modified by removing float strips and fixing 1.5" angle-iron section of proportionate length for making passageway for mud underneath the float bed of transplanter. It was conceptualized that supporting plates attached beneath the float bed of machine were bigger/wider in size, thereby restricting mud flow beneath the float bed. So, narrower angle iron section can serve the purpose.

## Practical utility of innovation

Narrow plates attached beneath the float bed of machine offer less resistance to flow of mud. As a result, mud splashing and burying of planted seedlings while transplanting of seedlings in puddled field is restricted.



View of Modified Paddy Transplanter



# Hand Operated Single Cow Milking Machine (*Valarpirai Milker*)

**Shri S. Muthusamy**

Post Thalampady, District Namakkal, Tamil Nadu  
(Phones. : 04286-224459,04286-244203, 09443825812)

## Profile

Age	: 44 years
Education	: 9 std
Landholding	: 2 ha
Farming experience	: 10 years
Livestock	: Dairying

There is huge demand for milking machines to overcome the labour shortage and also reduce the drudgery on milking women/men. Initially innovator assembled milking machine by purchasing component parts from JSM, Kerala and Universal Company, Coimbatore, but the cost ranges from '25000 to '42000 which is not affordable to small and marginal farmers. Then, he modified existing commercial single cow machine with low cost.

## Description of innovation

The accessories like milking cup and teat, non return valve, pressure pump, private plastic moulders etc., are used for designing hand operated single cow milking machine (*Valarpirai Milker*). The principle of operation of this machine is as same as existing commercial single cow milking machine. Replaced the metallic clutches with highly durable plastic and inner liner with locally fabricated material. The junction and tubes are also locally fabricated. The motor and pulsator of commercial milking machine is avoided in this machine.

## Practical utility of innovation

Innovated machine operates through vacuum pressure created through hand operated pump. It reduces the dependency on vender for milking especially to small farms having 2 to 3 animals. It is low cost, easy to maintain and operate, self repairable, portable and women friendly. No injury on teats and udder while milking by using this machine. Milking time is 6 to 8 minutes. Cost is Rs 4500/unit. So far 92 machines are sold.



A view of hand operated single cow milking machine (*Valarpirai Milker*) and milking by using it



# Modified Pulverizing Roller

**Shri Avtar Singh**

VPO Kangrod, District S.B.S. Nagar, Nawanshahar, Punjab

(Mobile : 09463180285)

## Profile

Age	: 37 years
Education	: 10 std
Landholding	: 5 ha
Farming experience	: 18 years
Crops grown	: Wheat and paddy
Livestock	: Dairy animals

## Recognition

Farmer and village level artisan

## Description of innovation

While observing pulverizing roller attachment to cultivator attached to the tractor having cage wheel fixed to tyres, it was conceptualized that big size pulverising roller could be attached directly to tractor for better puddling and ease of operation. Accordingly, mild steel angle-iron were welded in four different sections on circular mild steel rectangular section with 50 mm mild steel axial shaft. Wooden bearings were used and mild steel frame was made for tractor hitching.

## Practical utility of innovation

The original pulverizing roller takes more time for cultivation operation and planking. Modified machine with larger diameter roller are convenient to operate as its depth of penetration is less and their is more area for churning of puddle. Thus, it takes less time and consume less diesel in puddling operation. The innovator has sold more than 55 machines and is earning Rs 15000 per machine.



View of Modified Pulverising Roller



# Engine Operated Sprayer

**Shri Mohan Singh**

VPO Sadhra, District S.B.S. Nagar, Nawanshahar, Punjab

(Mobile : 09463692244)

## Profile

Age	: 34 years
Education	: B.A.
Landholding	: 5.2 ha
Farming experience	: 12 years
Crops grown	: Wheat, paddy, poplar/eucalyptus plantation, kinnow and guava orchards

## Description of innovation

Observing the tractor operated boom sprayer, it was conceptualized that a long pipe attached to pump make it versatile and a small diesel engine can run the pump and make tractor free for other farm operations. Accordingly, a 750 litre plastic tank was fixed on the frame having tyres attached on two sides and hook for towing with tractor. An ASPEE-HTP triplex plunger pump was used and operated with 5.6 hp 3600 rpm Greaves diesel engine.

## Practical utility of innovation

The tractor operated boom sprayer was having low application efficiency of pesticides along with excessive labour requirements. The engine operated sprayer has auto tank filling option and manual winding reel for managing the spray pipe. Thus, filling of tank and winding of pipe on reel increase the overall efficiency of the machine. It is very handy machine for insecticides/pesticides application in orchards and saves labour and time.



Engine Operated Sprayer



# Junk Refrigerator Modified as Homestead Incubator

**Shri G.M. Subramaniyam**

10/21, Ganapathipalayam, Post Oruvanthur, District Namakkal, Tamil Nadu

(Mobile : 09842749048)

## Profile

Age	: 21 years
Education	: Diploma in Refrigerator and Air Conditioning Mechanic, Diploma in Mechanical Engineering
Landholding	: 2.4 ha
Farming experience	: 5 years
Livestock	: Poultry farming with desi birds, turkeys and Bengal goose

## Description of innovation

Junk refrigerator is converted as incubator for hatching out eggs. The principle of operation, maintenance of required temperature, humidity etc., are similar to the commercial incubator. Necessary humidity is obtained from evaporation of water that is kept in the refrigerator. Temperature is controlled automatically through capsule relay (Methane Gas Pack). Uniformity of temperature and humidity across the machine is maintained through 12 watt three inch fan. In addition for cross checking temperature and humidity, a digital thermometer is also fixed. For air circulation, few holes are made in the front portion of refrigerator.

## Practical utility of innovation

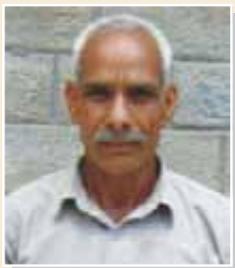
Innovated incubator is easy to operate, less maintenance and gender friendly. Hatchability on an average is 75%. Hatching of 100 eggs in this incubator consumes 21 units of electricity that costs Rs 84. One chick production cost is Rs 1.10. Cost of incubator is Rs 5000. So far 9 incubators have been sold to the desi chicken farmers across Tamil Nadu. All those farmers expressed their satisfaction on this low cost incubator.



A view of innovated incubator



Keeping eggs in a tray for hatching in innovated incubator



# Multi Purpose Tiller Cum Puddler

**Shri Parma Ram Chaudhary**

Village Chhatter, P.O Jughahan, Taluq Sundernagar  
District Mandi, Himachal Pradesh (Mobile: 09805756261)

## Profile

Age	: 58 years
Education	: 10 std
Landholding	: 2 ha
Farming experience	: 40 years
Crops grown	: Wheat, paddy, maize, vegetables, oilseeds and pulses
Livestock	: Dairy Animals

## Recognition

Non-official member of Governing Board  
ATMA, Distt. Mandi

## Description of innovation

Multi-purpose tiller cum puddler has been developed using the engine of an abandoned scooter (Lambretta) in the year 2009. The innovator has also fabricated puddler tines, tillers, ridge makers and a weed scraper for use in puddling, ploughing, ridge and channel making and weed scraping in wider spaced crops, respectively. The fabrication of this equipment along with different attachments was done at the cost of Rs 21000 only.

## Practical utility of innovation

The equipment resulted in higher efficiency of 0.064 ha/day in ploughing operation, 1.92 ha/day in puddling operation, 1.28 ha/day in ridge and channel making and 0.64ha of weed scraping operation in spaced crops. It can be efficiently operated using kerosene oil after initial ignition with petrol. This equipment uses 50 ml petrol and 1 litre Kerosene per hour covering 0.024 ha area for puddling, 0.08 ha for ploughing, 1 ha for ridging and channel making and 0.08 ha for weed scraping operations. The equipment is economically viable as it saves huge manual labour as well as draft power.



Multi-purpose tiller cum puddler



Different attachments of the machine



# Manually Operated Weeder-Halodu

**Shri Raj Kumar**

Village, Dalchera, P.O Nain, Tehsil Barsar, District Hamirpur, Himachal Pradesh  
(Mobile : 09218723125)

## Profile

Age	: 42 years
Education	: Primary
Landholding	: 0.4 ha
Farming experience	: 25 years
Crops grown	: Maize and wheat

## Description of innovation

Farmers of the area use draft power for inter-cultural operations in maize. Due to diminishing practice of bullock rearing by the farmers, there was need of some low cost technology as inter-cultural operations by tractors are costly and less effective in sloppy areas. Accordingly, the farmer developed the machine using second hand wheel and chimta of bicycle locally available in the area.

## Practical utility of innovation

Halodu is not only useful for weeding operation in maize crop but also for line sowing of maize as well as crops like spinach, sarson and coriander sown in kitchen gardens. Line sowing of maize with halodu takes only 3-4 hours per kanal area which is just one fourth compared to same operation with Kuddali or other manual implement. Halodu is also suitable for furrow opening in which fertilizer and seed can be put in lines manually.



Full view of Halodu



Halodu in operation



# Modified Maize Sheller

**Shri Surjit Singh**

Village Chagran, Tehsil & District Hoshiarpur, Punjab

(Mobile: 09815082477)

## Profile

Age	: 48 years
Education	: Graduate
Landholding	: 14 ha
Farming experience	: 20 years
Crops grown	: Maize, wheat, paddy, vegetables and forest crops
Livestock	: Buffaloes and cows

## Recognition

Member of ATMA

## Description of innovation

S. Surjit Singh of village Chagran has modified the maize sheller by mounting it on a small stand. It enhancing the efficiency of the tool by 20%. This very simple and handy device is useful for removing maize grains from the maize cob very easily and effectively. This tool is made of iron and other locally available accessories.

## Practical utility of innovation

This innovation is highly beneficial for small farmers having marginal land holdings or the farmers who are going to use the maize for seed purpose. This modified maize sheller is very economical, handy and efficient in working. Only a single person is required for operating this sheller. Maize being the major crop of the area, it is almost mechanized for shelling but this tool is gaining popularity amongst the marginal farmers and farm labourers who take their wage in the form of maize cobs.



Side view of maize sheller



Maize sheller in operation



# Vermi-compost and Worm Separator

**Sh Amrik Singh**

Village Chagran, Tehsil & District Hoshiarpur, Punjab

(Phone: 01882-274313)

## Profile

Age	: 52 years
Education	: Matriculation
Landholding	: 11.2 ha
Farming experience	: 22 years
Crops grown	: Maize, wheat, paddy and vegetables
Livestock	: Buffaloes and cows

## Recognition

State award in vermi-composting, member of school committee

## Description of innovation

Farmer has developed a small machine which can separate vermi-compost from worms very easily. This is having meshes of different sizes and there are two separate outlets for vermi-compost and worms. Machine is simple in design, low cost as well as labour and time saving. This machine is made of iron, pulleys, small motor and other locally available material.

## Practical utility of innovation

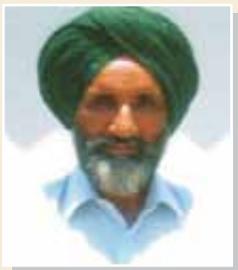
The machine is very useful for separating vermi-compost from worms very easily and effectively. As this saves time and labour, it can help in promoting vermi-culture in the farming community. It is new concept and with the popularization of vermi-culture, there is scope of its adoption by other farmers.



Vermi-compost and worm separator



Side view of the machine



# Manually Operated Plastic Paper Roller

**Shri S. Amar Singh**

Village Manuke, District Moga, Punjab

(Mobile : 09464217128)

## Profile

Age	: 50 years
Education	: Illiterate
Landholding	: 0.8 ha
Farming experience	: 20 years
Crops grown	: Vegetable and paddy
Livestock	: Buffaloes

## Recognition

Recipient of S Ujjagar Singh Dhaliwal Memorial Best Vegetable grower award for 2009 at Punjab Agricultural University Kisan Mela

## Description of innovation

This farmer has designed a simple machine with iron stand to wrap plastic sheets used in low tunnel technology of vegetable cultivation in less time. Roller has three revolving iron rods with gears operated manually with the half of a handle. The overall size of the roller is 5'X4'X4' and approximate cost is Rs 1500.

## Practical utility of innovation

This roller is adaptable to wrap all plastic sheets used to cover vegetable crops. This task usually require a lot of labour, moreover the plastic wrapped by the labourer get damaged in many cases. With this roller quick rolling of the plastic sheets is possible as it rolls about four quintal plastic in a day. It automatically sweeps the dust stuck on the plastic sheets and ensures cleanliness. These plastic sheets can be used easily in next year.



Manually operated plastic paper roller



## Seed Sowing Drum in Nursery Bed

**Shri S. Amar Singh**

Village, Manuke, District Moga, Punjab

(Mobile : 09464217128)

### Profile

Age	: 50 years
Education	: Illiterate
Landholding	: 0.8 ha
Farming experience	: 20 years
Crops grown	: Vegetable and paddy
Livestock	: Buffaloes

### Recognition

Recipient of S Ujjagar Singh Dhaliwal Memorial Best Vegetable grower award for 2009 at Punjab Agricultural University Kisan Mela

### Description of innovation

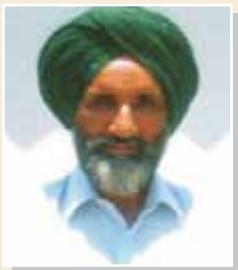
The developed nursery sowing drum consists of a heavy metallic drum attached to an iron stand. The metallic drum is deeply grooved all over. When a farmer pulls or pushes this drum on a well prepared nursery bed, it makes definite grooves on the surface, in which seeds of any vegetable crop can be sown. The diameter of drum is 1.5' and length of drum is 2.5', handle is usually 3'. The apparent cost is Rs 2000.

### Practical utility of innovation

Drum sown seed were in straight lines, in controlled depth, improved germination of seeds and easily weeded in nursery beds.



Nursery sowing drum



# Nursery Transplanting Machine

**Shri S. Amar Singh**

Village Manuke, District Moga, Punjab

(Mobile: 09464217128)

## Profile

Age	: 50 years
Education	: Illiterate
Landholding	: 0.8 ha
Farming experience	: 20 years
Crops grown	: Vegetable and paddy
Livestock	: Buffaloes

## Recognition

Recipient of S Ujjagar Singh Dhaliwal Memorial Best Vegetable grower award for 2009 at Punjab Agricultural University Kisan Mela

## Description of innovation

Machine resembles hand driven wheel hoe. Similarly it has a wheel base fitted with solid cups. When this machine is moved on well prospered fields, it helps in making small pits to tram plant seedlings. This machine is especially helpful in transplanting seedlings raised in conical plastic trays. The approximate cost of the machine is Rs 1000.

## Practical utility of innovation

Helps in transplanting seedlings in fields at faster rate. By making adjustments at wheel base the same machine can be used for adjusting plant to plant distance in different crops. It saves labour in transplanting of crops.



Nursery transplanting machine



# Carrot Washing Machine

**Shri S. Rachpal Singh**

Village Killi Gandharan, District Moga, Punjab

(Mobile : 09914161193)

## Profile

Age	: 44 years
Education	: Middle School
Landholding	: 3.6 ha
Farming experience	: 30 years
Crops grown	: Carrot, vegetable and paddy
Livestock	: Buffaloes

## Recognition

Ex member Punjab Young Farmers Association , Jalandhar

## Description of innovation

Machine consists of large hollow drum fitted with inlet and outlet water pipes. Machine is engine operated. Carrots are put into the drum and the drum is rotated with the help of an engine. This machine helps in getting good quality carrots for market sale. The approximate cost of the machine is Rs 6000 excluding engine cost. It washes 2.25 quintals of carrots in 15-18 minutes.

## Practical utility of innovation

Washing of carrots through this machine is very easy. The machine removes the hairy growth on the carrots resulting in higher market price of the product. Besides, it saves labour in the cleaning process.



Carrot washing machine



# Modified Honey Extractor

**Shri Priya Bandhu Pal**

Village Kariamora P/S. R. K. Pur, R.D. Block Matabari, South Tripura, Tripura  
(Mobile : 9612751652)

## Profile

Age : 40 years  
Education : 6 std  
Landholding : 0.5 ha  
Farming experience : 15 years  
Crops grown : Rubber and apiculture  
Livestock : Cow and duck

## Recognition

Famous honey extractor

## Description of innovation

A honey extraction method developed to avoid the regular problem in manual extraction of honey as the commercial extractors are costly. The main features of the machine are that it is made of wood instead of iron as found in commercial machine. It consists of two gears, a bin made up of tin, wooden comb stand, GI wire net and a handle to rotate the comb stand. This honey extractor is cost effective and can be manufactured by using locally available materials like tin, wood, GI nets etc.

## Practical utility of innovation

By the new extraction method the two major problems namely frequent damage of the comb and time consumed could be minimized up to a great extent. With this machine farmers are harvesting about 1.5 kg of honey per hour, farmers are harvesting about 25 kg of honey per year per colony costing about Rs 7000 as per local market rate. The cost benefit ratio in the first year is 1:2

and in the subsequent year expenditure is almost negligible and profit is about Rs 6000 per year per box with B:C Ratio 1:6. Only family members of the farmers are involved in honey extraction and the cost of extra labour is zero. Farmer can do the extraction without engaging any additional labour. Hence extraction of honey can be done when honey is ready for harvesting. Labour saving is about 80%.



Modified honey extractor



# Cocoon Deflosser

**Shri Malayya**

Alambur Munti, Taluk Nanjangud, District Mysore, Karnataka

(Mobile : 09343871990)

## Profile

Age	: 63 years
Education	: Diploma in Mechanical Engineering
Landholding	: 7.2 ha
Farming experience	: 25 years
Crops grown	: Paddy, sugarcane, sericulture, banana and coloured capsicum
Livestock	: IFS model and poultry

## Recognition

President of Organic Farmers' Forum

## Description of innovation

The Cocoon Deflosser developed by Shri.Mallaya had a mesh to glide the cocoons in front of the mesh. A rod of 6 mm is fixed and for easy operation of the device a universal joint is fixed. Operates with 0.25 hp motor. It removes outer layer of cocoon called floss which hides the cocoons beauty that makes it accepted in the cocoon market for premium price.

## Practical utility of innovation

Removal of floss layer is an important process before farmers take cocoons to the market, which is laborious, time consuming and incurs high cost. This innovation by the farmers is simple to operate and portable. The cocoon deflosser could remove floss about 80 kgs per day which is double the capacity of machine introduced by research institute. It saves labour, time and is cost effective. Many sericulture farmers attracted to, this device and lot of demand is there for this device. The farmer could sell 400 such devices. Cost of the device is Rs 5000.



Cocoon Deflosser in operation



A Cocoon Deflosser



# Multi-Purpose Food Processor

**Shri Dharmbir**

V. P. O. Damla, District Yamunanagar, Haryana

(Mobile : 09896054925)

## Profile

Age	: 42 years
Education	: 10 std
Landholding	: 0.8 ha
Farming experience	: 12 years
Crops grown	: Paddy, wheat, aloe vera and stevia
Livestock	: Buffaloes

## Recognition

Recipient of State Award by National Innovation Foundation, India

## Description of innovation

A multipurpose food processing machine was developed by Sh. Dharmbir which works as juicer, grinder, mixer, steamer and boiler. Height of the drum is 3 feet, Diameter 7½ feet and height of the leg from the ground 1½ feet. Its capacity is 1.5 q leaves per hour.

## Practical utility of innovation

The machine developed can crush and extract juice or oil from herbs, fruits and vegetables. This machine can extract 100 l Aloe vera juice per hr. The innovator is selling the Aloe vera juice bottle of 1 l @ 200. He is selling Aloe vera Shampoo and gel, Aonla juice and other herbal products too. He is earning Rs 60000 per month and providing employment to 25 BPL farm women of village Damla, who help him to grow Aloe vera and Stevia in the field and for peeling of Aloe vera leaves and packaging etc. at his processing unit.



Innovator interacting with the President



View of the food processing unit



# Marking Roller

## Master Nisan Singh

V. P. O. Kalyan, Tehsil. Malerkotla District Sangrur, Punjab

(Mobile: 09814577999)

### Profile

Age	: 54 years
Education	: B.A.
Landholding	: 3.6 ha
Farming experience	: 11 years
Crops grown	: Paddy, wheat, seasonal vegetable and banana

### Description of innovation

The roller is of five inch diameter of MS pipe with width of three feet. On the circumference of the pipe, angle iron of size one inch and length three feet are fitted to break the small clods on the bed. On both sides of the roller, plain iron sheet of six inch width is attached to make transplanting of nursery within the bed. This makes the manual as well as chemical weeding easy and safe. Two rings of six inch diameter are fitted separately at distance of six inch from both ends of the roller. For marking equal distances on the bed, two pointers are welded on the circumference of rings in opposite direction.

### Practical utility of innovation

This is an equipment for sowing the vegetable nursery at accurate spacing. It is also used for transplanting the vegetable seedlings at accurate spacing. The equipment saves the labour leading to reduced cost of cultivation. It also reduces the drudgery.



Marking Roller



Marking done by the marking roller



# Mushroom Compost Turning Machine

**Shri Jitender Malik**

Village Seenkh, District Panipat, Haryana

(Mobile : 09813718528)

## Profile

Age	: 30 years
Education	: 10 std
Landholding	: 2 ha
Farming experience	: 14 years
Crops grown	: Paddy, wheat cropping system integrated with mushroom production
Livestock	: Cow and Buffaloes

## Description of innovation

Good quality compost is critical for a good harvest. The Mushroom Compost Turning Machine breaks all the clots in the compost, throws inner layer outside and outer layer inside and thereby facilitating the escape of Ammonia. It also facilitates the expansion of the unit/trays leading to large scale mushroom production possible.

## Practical utility of innovation

This machine turns 100q of compost material in 20 minutes substituting 50 labours/day. Consequently, it also saves time. The water sprinkled over the compost is evenly distributed by spray nozzles. It makes homogenous mixture resulting in better quality compost. The quality compost ensures high yield, better quality of mushroom and reduces chances of failure. Also the machine is easy to operate. Two persons can easily push the machine and set it into operation with power. The present cost is Rs 1.7 lakh, likely to reduce if adopted largely and fabricated locally.



Mushroom compost turning machine



# Cost Effective Improvised Hole Making Machine

**Shri Jitender Malik**

Village Seenkh, District Panipat, Haryana

(Mobile : 09813718528)

## Profile

Age	: 30 years
Education	: 10 std
Landholding	: 2 ha
Farming experience	: 14 years
Crops grown	: Paddy, wheat cropping system integrated with mushroom production
Livestock	: Cow and Buffaloes

## Description of innovation

Low cost mushroom production technology involves the use of thatched houses erected on bamboo sticks drilled in the ground by making holes. The mushroom shed of 100 q compost capacity is erected by making 80 holes. The holes made by the machine which operates with the help of 3 HP electric motor are of even depth and diameter of the holes exactly match with the diameter of the bamboo sticks. This gives greater stability to the thatched house which makes it possible to increase the spacing between two adjacent holes.

## Practical utility of innovation

This machine has the efficiency of 8 man days. Such efficacy is of great practical utility as the labour is scarce and costly. The machine ensures greater stability of the mushroom shed. The shed can bear the torque generated by the rainfall accompanied with high speed wind. Otherwise, the collapse of mushroom sheds under such weather does happen in the district. The cost of this improvised machine is Rs 11000 which is recoverable in one season.



Cost effective improvised hole making machine



# Manually Operated Line/ Row Marker

**Shri Chakreswar Bora**

Dachamua, Golaghat, Asom

(Mobile: 9854585032)

## Profile

Age	: 66 years
Education	: Lower primary
Landholding	: 60 bigha
Farming experience	: 40 years
Crops grown	: Cabbage, cauliflower, knolkhol, raddish, brinjal, tomato, potato and chilli
Livestock	: Pigs, goats, ducks and cows

## Recognition

President of Bahumukhi SHG

## Description of innovation

Shri Chakreswar Bora has made an innovation in line/row marking. The farmers call it as computer technology because they are able to make lines at proper distance for sowing and planting of seeds and planting materials respectively particularly in *Rabi* crops. The structure is made up of wood and bamboo. There is flexibility in adjusting the distance depending on the crops and varieties. It is manually operated and 4 to 6 lines may be made at a time. There are three models, two types of which are used by the farmers of Dachamua village and the other model is used by the farmers of Rajabari village of Golaghat district of Assam.

## Practical utility of innovation

In *Rabi* crops making lines is a time consuming and tedious job. High cost is involved due to more labour requirement and physical labour. With this innovation, 5-6 rows can be made easily and accurately in less time. Only two numbers of labourer are required to do the job, therefore cost involvement is also less along with less physical labour. The farmers can also do the job in an erect position without bending and hence work can be done comfortably without back pain.



Line /Row Making Innovative implement (Computer) made with iron at Dachamua Village



Line /Row Making Innovative implement (Computer) made with wood at Dachamua Village



Line /Row Making Innovative implement (Computer) made with wrought iron at Rajabari Village



# Tool for Rice Cum Fish Cultivation

**Shri Tomo Riba**

Village Regi, P.O Basar, District West Siang, Arunachal Pradesh

(Mobile : 09402249995)

## Profile

Age	: 42 years
Education	: B.Sc (Ag)
Landholding	: 10 ha
Farming experience	: 32 years
Crops grown	: Rice, maize, pea, mustard, potato, black gram, green gram, french bean
Livestock	: Dairy and Poultry

## Recognition

Recognized by local administration

## Description of innovation

The system is used for controlling the passage or crossing over of the fingerlings from one plot to another plot with the help of small bamboo sticks fixed vertically nearby the outlet of water in semi circular manner. The outlet of water is also made through a piece of bamboo which may be of one node or two as per the bund thickness of the plot. This piece of bamboo is hollowed inside like a pipe and fixed beneath the bund by giving a slope as desired by the farmer for easy flow of water from the upper elevated plot. The 'Tape' is made with the net fixing as per the design upto the level of water in the field. The *Tape* is particularly used to control the crossing over of the fingerlings of middle finger or little finger size from one plot to another part so that the fish population can be maintained uniformly in the field.

## Practical utility of innovation

In normal rice cum fish culture, the farmer has to check the level of water at least once a day to keep the fingerlings intake inside the plot. As a number of hollowed bamboo nodes are fixed as per the size of the plot, checking the whole day is not required saving the day's labour. The total cost of the system is Rs. 180 per plot and return from each plot is approximately Rs 1650.





# Tool for Fertilizer and Soil Mixing at Pits

**Mrs Ajanta Das**

Rajabari, Golaghat, Asom

(Mobile : 09859977602)

## Profile

Age	: 31 years
Education	: TDC
Landholding	: 40 bigha
Farming experience	: 9 years
Crops grown	: Cabbage, cauliflower, pea, tomato, garlic, lentil, carrot, chilli, brinjal, wheat, rapeseed and mushroom
Livestock	: Goatery, cattle and fishery

## Recognition

Secretary of Seuj SHG

Facilitated on Kisan Samman Diwas and by Golaghat District Administration on Independence Day

## Description of innovation

This is used by the farmers of Rajabari Village of Golaghat district of Assam in mixing the fertilizers particularly in crops which are planted in pits. It is made up of Iron. This is particularly useful for mixing fertilizers comfortably without back pain.

## Practical utility of innovation

Fertilizer mixing is to be done in each and every pit manually. Physical labour is more with back and wrist pain. Time consumption is more and contact of fertilizer and chemicals with hands resulting in skin problems. Using this innovation, fertilizer mixing can be done easily and comfortably with the implement utilizing one labour and physical labour is less. Time consumption is also less and since contact of fertilizer and chemicals with hands is nullified, it is completely safe. The farmer can do the job in an erect position without bending and hence work can be done comfortably without back and wrist pain. Since it is a new and recent innovation till now only 10-15 % of the farmers have adopted the technology.





# Water Mill for Pounding Rice

**Smt Phalneikim**

Village Haipei, P.O. Kangpokpi, District Senapati, Manipur

## Profile

Age	: 44 years
Education	: 10 <sup>th</sup> std.
Landholding	: 1.2 ha
Farming experience	: 20 years
Crops grown	: Rice, various vegetables and flowers
Livestock	: Pig, poultry and dairy animals

## Recognition

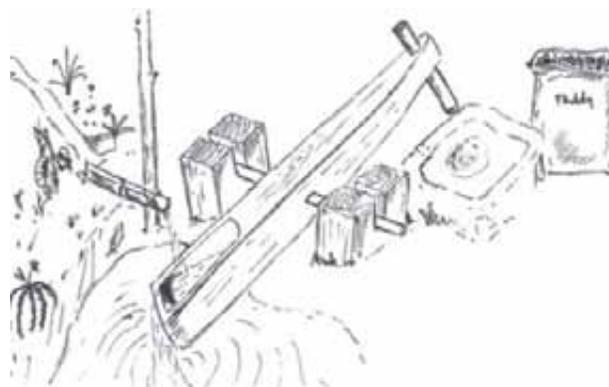
Member of Village Church and Women Society

## Description of innovation

Wooden log with incurved surface at one end and gradient of the flowing water is employed. In one of the adopted village of KVK-Sylvan, the community as a whole use water mill for pounding of rice employing the gravity of flowing water of perennial stream as energy. In one day about 20 kg of paddy can be pounded.

## Practical utility of innovation

The technology is labour saving, cost effective and reduces drudgery of farm women. Proper utilization of time by the farm women in attending other house hold activities is also a benefit.



Local made water generated pounding device (paddy)



# Manually Operated Tapioca Chopper

**Shri Imtjungshi**

H.No. 234, Mangkotrong , Village Ungma, Mokokchung, Nagaland

(Mobile: 09436205731)

## Profile

Age : 58 years

Education : 7 std.

Landholding : 12 ha

## Recognition

Recipient of Innovative Farmer Award of Nagaland by ATMA in 2010

## Description of innovation

The Tapioca Chopper is a machine which is operated manually and does not need electricity for operating it. It is a handy tool for chopping tapioca tubers which is popular and become second in terms of acreage and production in the district. It is a multipurpose utility. It is made of wood and iron sheets. By using this Tapioca Chopper it generally chopped into fine pieces and it can chop 20kgs of fresh tuber in one hour. It can be easily carried by one person and takes in to the field where operations can be done. It is an affordable item which costs only Rs 1500.

## Practical utility of innovation

The farmers need not waste labour in carrying the bulky tubers from the field to their homes. Using this chopper the farmer can easily chop more than 60kg of tuber in one hour. It can produce more than 3 times of the quantity compared to the usual system. In collaboration with APMC of the district the chopper has been provided to all the villages in the district and there is a great demand from individual farmers.



Tapioca chopper



# Portable Cardamom Drier

**Shri Tavesii Vadeo (Proprietor)**

SAWO Manufacturing Unit, Sakraba Village, Dist Phek, Nagaland

(Mobile : 09436204326)

## Profile

Age	: 57 years
Education	: 12 <sup>th</sup> Std.
Landholding	: 15 ha
Farming experience	: 20 years
Crops grown	: Passion fruit, large cardamom, naga chilli, king chilli, paddy, maize, kiwi fruit
Livestock	: Piggery, poultry, rabbitery and cows

## Recognition

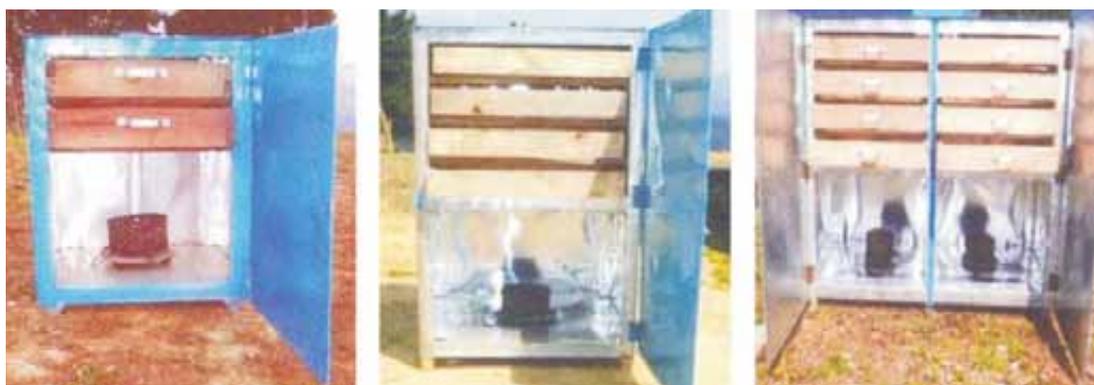
Advisor to Farmer's Union

## Description of innovation

Portable cardamom drier, locally known as SAWO has been developed by Mr.Tavesii Vadeo. The drier is available in three different types: (1) Kitchen drier or SAWO is portable drier having two detachable rakes with a single door and can be used for domestic purpose.(ii) Single drier or SAWO is portable drier having four detachable rakes with a single door having capacity of 16 kg fresh large Cardamom capsules at a time. Around 96 kg of fresh cardamom can be dried in a day.(iii) Double drier or SAWO is portable drier having double door system, four detachable rakes on each sides with a drying capacity of 40kgs fresh large cardamom capsules at a time. The drier is made of wooden and aluminium sheet only. The sources of heating in the drier are both charcoal and electricity.

## Practical utility of innovation

Quality of sundried cardamom is poor as it takes long time in drying and becomes black so less favoured in market, on other hand due to fast drying good colour and flavour is maintained so cardamom is favoured in market.



Different types of SAWO



# Manually Operated Winnowing Fan

**Shri Tokmin Perma**

Village Jia, PO Roing, District Lower Dibang Valley, Arunachal Pradesh

## Profile

Age	: 40 years
Education	: 12 std.
Landholding	: 100 ha
Farming experience	: 17 years
Crops grown	: Paddy, maize, mustard, bengal gram, vegetables and tea
Livestock	: Scientific piggery

## Recognition

Progressive farmer and representative in APMC and ATMA

## Description of innovation

A new manually operated winnowing fan made by Shri. Tokmin Perma for winnowing of harvested crops. It consists of 5 blades designed using scrap GI Sheets fixed on one end of an iron shaft. A gear is fixed on the other end of the shaft which gets it drive from the gear fixed on the end of the rotating handle, thereby rotating the blade. The whole set of the machine is mounted on a stand made of locally available wooden material. The cost of the operation per day is approximately Rs 240.

## Practical utility of innovation

The winnowing fan can be used manually which saves time and labour by 80%. It helps in handling large quantity of farm produced within a short period of time in comparison to the winnowing by traditional method. The net return per day is approximately Rs 360 with a cost benefit ratio of 1:2.5.



Winnowing fan



# Manually Operated Adjustable Row Marker

**Shri Mipang Lego**

Village Kangkong, PO Roing, District Lower Dibang Valley, Arunachal Pradesh

## Profile

Age : 35 years

Education : 10 std

Landholding : 24 ha

Farming experience : 9 years

Crops grown : Paddy, Maize, Mustard, Bengal Gram, Vegetables and Tea

Livestock : Poultry

## Recognition

Progressive farmer and representative in APMC and ATMA

## Description of innovation

A new manually operated winnowing fan was made by Shri Tokmin Perma for winnowing of harvested crops. It consists of 5 blades designed using scrap GI Sheets fixed on one end of an iron shaft. A gear is fixed on the other end of the shaft which gets it drive from the gear fixed on the end of the rotating handle, thereby rotating the blade. The whole set of the machine is mounted on a stand made of locally available wooden material. The cost of the operation per day is approximately Rs 240.

## Practical utility of innovation

The winnowing fan can be used manually which saves time and labour by 80%. It helps in handling large quantity of farm produce within a short period of time in comparison to winnowing by traditional method. The net return per day is approximately Rs 360 with a cost benefit ratio of 1:2.5.



Adjustable row marker



Crop grown by using adjustable row marker



# Orange Fruit Harvester Made from Bamboo Materials

**Shri Tana Tada**

Village Laptap, Toru, Sangalee, District Papumpare  
(Mobile: 09402427347)

## Profile

Age	: 42 years
Education	: 12 std.
Landholding	: 70 ha
Farming experience	: 30 years
Crops grown	: Paddy, maize, orange and pineapple
Livestock	: Cow, Mithun

## Recognition

Progressive farmer and an active public leader

## Description of innovation

A new orange fruit harvester was made by Shri Tana Tada from commonly available Bamboo materials. The bamboo has been sliced at the top portion in the form of conical shape where in, the fruits are easily dropped. This prevents the orange from falling down to ground. The long bamboo pole makes harvest easy and thus one can pluck the fruits while standing on the ground.

## Practical utility of innovation

This fruit harvester could be easily used for harvesting the fruits without deteriorating the quality of the fruit. Though it consumes much time but the quality of fruit is maintained for longer duration. The Cost benefit is 1:6 and the adoption is 60% by the farmers of the Papumpare District.



Orgnge fruit harvester



# Tractor Operated Winnowing Fan

**Shri Tokmin Perme**

Village Jia, P.O Roing, District Lower Dibang Valley, Arunachal Pradesh

(Mobile : 09436048144)

## Profile

Age	: 40 years
Education	: 12 std.
Landholding	: 100 ha
Farming experience	: 17 years
Crops grown	: Paddy, Maize, Mustard, Bengal Gram, Vegetables, Tea
Livestock	: Scientific Piggery

## Recognition

Progressive farmer and representative in APMC and ATMA

## Description of innovation

Shri Tokmin Perme, of Lower Dibang Valley District developed tractor operated Winnowing fan consisting of 3 blades welded to an iron pipe at one end. The other end is machined to fit into PTO shaft of the tractor.

## Practical utility of innovation

The cost per day is Rs 1380 and the gross return is Rs 2900 while the net return is Rs 1520 and the cost benefit ration is 1:2.1. It saves 96% of time and labour . It can winnow 100 bags of rice in a day in comparison to the traditional method of only 4 bags of rice per day. So, the farmers from Old Abali village are willing to adopt this new technology at their farm.





# Toyatebtsu (A Multipurpose Tool-Spade, Shovel and Jumber)

**Shri Imanluien Longkumer**

House No 232, Aongza ward, District Mokokchung, Nagaland

## Profile

Age : 40 years  
Education : B.Sc (Ag)  
Landholding : 40 ha

## Recognition

Recipient of innovative farmer award by ATMA in 2010

## Description of innovation

The Toyatebtsu developed by Shri Imanluien Longkumer of Mokokchung district is a handy tool which was innovated taking into consideration the needs of 2-3 tools a farmer requires for carrying out the daily needs. It is made by using locally available materials of GI pipes and iron sheets. For a farmer it is a problem to carry 2-3 implements to attain their daily field operation. As the fields are isolated at a distance it is not safe to keep the implements in the field.

## Practical utility of innovation

The cost of Toyatebtsu multipurpose tool is very less and it is an affordable tool. The farmers can easily carry 2-3 Toyatebtsu tools at a time and can work efficiently. The cost benefit is 1:1.75 and many farmers are using this tool and getting benefit out of it.



View of toyatebtsu



# Refined Pepper Thresher

**Shri Gopala Krishna Sharma**

Saravu House, Post Padre, Via Perla, District Kasaragod, Kerala

(Mobile : 04998225100, 09446655218)

## Profile

Age	: 48 years
Education	: Graduation
Landholding	: 5 ha
Farming experience	: 28 years
Crops grown	: Coconut, arecanut, pepper, banana, cashew, vanilla, cocoa and vegetables
Livestock	: Dairy, duckery, poultry, bee keeping and biogas plant

## Recognition

Member of Milk Cooperative Society,  
Member of Vikas Vahini Volunteer Club

Received certificate of honour from KVK,  
Kasaragod

Refinement made by Shri. Sharma is using cheap available materials and the main difference is that it is provided with a gate on the outer cover to remove the spikes after threshing. This is a batch type threshing device. Major difference is that the gate on the side to remove spikes after threshing whereas the hood is to be rotated and lifted as in TNAU model.

## Description of innovation

A rotating drum and a stationary curved plate are the main parts of the refined pepper thresher. Since the clearance between the rotating drum and the stationary plate is less than the pepper bunch, individual berry gets detached from the stalk. The detached berry fell through the holes provided in the stationary plate and gets collected in a container kept at the bottom of the machine. An opening with a door is provided at the other end of the feeding side to collect the stalk after threshing.

## Practical utility of innovation

Refined pepper thresher is used to thresh green pepper before drying. Thresher has a capacity of threshing 100kg per hour with 95% berry and the cost involved is Rs 30, where in manual threshing, it is 6 hours for 100 kg with 80% berry and the cost involved is Rs 200. It can thresh all varieties of pepper.



Front view of thresher



Feeding of pepper spikes



# Roller and Hooked Hand Weeders

**Shri Chikkaboregowda**

Sathanur, Mandya Taluk and District, Karnataka

(Phone : 09341167703)

## Profile

Age : 52 years  
Education : 10 std  
Landholding : 2.24 ha  
Farming experience : 35 years  
Crops grown : Sugarcane, ragi, paddy, cowpea, tur, chillies and green manure crops

## Recognition

Chairman, Raithara Seva Sahakara Sangha, Mandya District

Member, Bharathiya Kisan Sangha and Member, Organic Farming (DOA)

## Description of innovation

Shri Chikkaboregowda developed two hand weeders – one is roller and another is hooked. The roller hand weeder is made of iron plate with a width of 10 inches and a pair of weeding rollers made of iron attached in the centre with 3ft handle is suited for weeding in SRI paddy. The hooked hand weeder is six inches wide with three hooks is suited for aerobic paddy/ragi cultivation.

## Practical utility of innovation

Many farmers are reluctant to adopt SRI method due to increased weed problem especially during the initial growth period because of wider spacing. The roller and hooked hand weeders developed by the farmer are effective, eco-friendly and practical in removing the weeds in SRI, aerobic rice and ragi cultivation. Further, reducing labour cost for weeding in every operation. These implements are being used by the farmers in the village as labour saving device.



Weeding in SRI field through hooked hand weeder



Weeding in SRI field through roller hand weeder



## Two Wheeler Mounted Sprayer

**Shri Chandragouda M. Lingadal**

Post Harti, Taluq and District Gadag, Karnataka

(Phone : 09481680987)

### Profile

Age	: 40 years
Education	: Illiterate
Landholding	: 2 ha
Farming experience	: 20 years
Crops grown	: Bengalgram, tur, chilli, cotton and fruit and plantation crops

### Recognition

Received award and certificate from UAS, Dharwad

Information about the sprayer was published in Samyukta, a Kannada daily

Recognised by AIR, Dharwad and TV-9 through interview

Timely plant protection measures ensure better crop productivity. Many times it is not possible due to labour problem. Same is true in Harti village. This has led to design of two wheeler mounted sprayer by a farmer himself. He innovated the idea, designed and fabricated the sprayer. Effectiveness of the sprayer is demonstrated in the Krishi Mela organised by UAS, Dharwad during 2009.

### Description of innovation

Shri Chandragoud Mallanagoud Lingadal has designed two wheeler mounted sprayer. Compression pump is mounted on Bajaj M-80 two wheeler to generate pressure. Two water cans each of 25 l capacity are fixed on either side of the carrier. Horizontal pipe having 4 nozzles is fixed at the rear end for spraying field crops and provision for fixing 2 guns having 30 feet pipe length on either side for spray orchard crops like mango, sapota and coconut.

### Practical utility of innovation

Innovative sprayer can cover 12 ha in bengalgram, 6 ha in chilli, 8 ha in cotton per day, ensures timely spray, effective for uniform spray and solves labour problem for spraying. One manual labour can cover 0.4 ha per day whereas this sprayer can cover 6-12 ha depending on the type of crop, thus saving the cost of labour. Cost of sprayer is Rs 18000. This sprayer is being used by the farmers of Harti and surrounding villages on hire basis @ Rs 150 per acre.



A view of Two Wheeler Mounted Sprayer



# Multi Purpose Seed Drill

**Shri K.R. Rajashekharaih**

Koragere Post Yelanadu, Huliya Hobli, Taluq C.N. Halli, District Tumkur, Karnataka

(Moblie : 09008770114, 09900467090))

## Profile

Age	: 51 years
Education	: 10 std
Landholding	: 2 ha
Farming experience	: 30 years
Crops grown	: Ragi, jowar, paddy, coconut, and vegetables
Livestock	: Dairy farming

## Recognition

Member in Krishika Samaja, Bangalore  
Member in Savayava Krishi Samaja

Member in Veerashiva Samaja, Hobli

## Description of innovation

Designed device is a single implement for multipurpose operations like sowing, hoeing and weeding . The device is made of iron. No need for tying with rope every year before taking up sowing operation. This implement can be maintained for 15-20 years where as indigenous implement needs maintenance every year. Cost is Rs 2000 per unit.

## Practical utility of innovation

There is a scarcity of labour during important agricultural operations like sowing, hoeing, weeding etc. Designed implement is useful for achieving ideal seed depth of sowing as well as soil covering in one operation which results in saving of energy, time and money. This implement can also be used for weeding by slightly lifting the implement while taking up the operation. It can be drawn by both animal and tractor. There is a huge demand for this implement from many farmers as it is economical and multipurpose. Further, by using this implement, farmer could do away with cutting of trees every year for making wooden seed drill/hoe.



Designed  
Seed Drill-Cum-Hoe-  
cum-Weeder



# Kothandam's Casuarina Stubble Remover-cum-cultivator

**Shri Kothandam**

Thirukammu, Pallan Street, Post Semmangalam  
Taluq Vanur, District Villupuram, Tamil Nadu

## Profile

Age	: 43 years
Education	: 5 std
Landholding	: 1 ha
Farming experience	: 30 years
Crops grown	: Watermelon and casuarina

## Principle

The principle behind modification of Casuarina Stubble Remover-cum-Cultivator is digging of the stock with hard chisel as well as removal of the spring in the devise to prevent escaping of the stock and damage of the cultivator.

## Description of innovation

Shri Kothandam's Casuarina Stubble Remover-cum-Cultivator is a modification of existing tractor mounted cultivator. It is tractor mounted with 55 hp power. It has 5 chisel type cultivators with over all dimension of 7.5' x 2' and 410 kg weight. A strong 8" iron made central pole is playing a major role in this device in which the chisel is welded.

## Practical utility of innovation

Developed device could remove harvested root stock of casuarina very easily besides performing deep tillage up to 2 feet. It is easy to handle, cover 2 ha per day thereby reducing 150 man power per day/ha. It is being adopted by casuarina farmers in Villupuram District. Cost of the unit is Rs 15,000. Adopted farmers opined that the Kothandam's Casuarina Stubble Remover cum Cultivator is convenient to operate and solves labor problem.



Depth of ploughing



Type of the chisel



Removing of stubble



# Kranti Spray Pump

**Shri Mohan Lamb**

At Post Chinchpur, Taluq Dharur, District Beed ,Maharashtra

(Mobile : 09689984518)

## Profile

Age	: 36 years
Education	: 10 std
Landholding	: 1.5 ha
Farming experience	: 48 Years
Crops grown	: Pigionpea, fig, tomato, pulses millet

## Description of innovation

With the traditional knapsack sprayer more quantity of pesticide required also less pressure received during operation. For getting proper pressure more number of strokes and time is needed. In the twin nozzle system efficient spraying was not achieved. Kranti spray pump consists a knapsack sprayer with three gears systems, low cost filtration unit, easily maintenance/ repair parts, (Foundation for tank) prolonged handle for getting more pressure, pressure chamber of greater size, lance with double nozzle with standard spacing.

## Practical utility of innovation

This Kranti spray pump was purchased by 300 farmers and used by around 1000 farmers. The repair and maintenance cost of this sprayer is less. This sprayer is gender friendly i.e. both male and female can easily operate this sprayer. With this sprayer pesticide requirement is less and spraying can be completed within time with less drudgery is found to be economical. Income generated out of this innovation by the innovator was Rs 120000.



Spraying with Kranti spray pump



# Motor Cycle Operated Spraying Unit

**Shri Nandakumar Shankarrao Jadhav**

At Post Malegoan (BK), Taluq Baramati, District, Pune, Maharashtra

## Profile

Age	: 47 years
Education	: 10 std
Landholding	: 2 ha
Farming experience	: 20 years
Crops grown	: Sugarcane, banana, soybean and wheat
Livestock	: HF cow and buffalo

## Recognition

Member of farmers club

## Description of innovation

The idea of Motor cycle operated spray generated from discussion among the farmers group. Then farmers have taken a lead for development of such type of Spray unit which is Motor cycle operated along with fabricator. Then along with Fabricator they produced design. After design they made the Frame . After that they fabricated and produced this Motor cycle operated Spray Unit without harming the utility of Motorcycle.Pully is connected to crank shaft of the motor cycle to run the HTP unit .and speed of spray is controlled with the help of accelerator of Motor cycle.

## Practical utility of innovation

0.6 liter Diesel / Petrol is required to spray about one ha area thus cost for one ha spraying is just Rs. 30 Labour cost Rs 250 per day in conventional spray for 1 ha area ,While spraying with modified motorcycle mounted spray labour cost is just about Rs 25 for one ha area. 25 unites were running in one village which covers about 100 ha area. One person can earn about Rs 700 800/day by offering the services of the new device for spraying. 1 person sprays about 4-5 ha in a day with this new device, while with ordinary knapsack sprayer 1 person sprays only about 0.4 ha per day.





## Modified Rice Drum Seeder

**Shri Laxman Baburao alis Bal Dalvi**

At Vadap, Post Gourkamat, Taluq Karjat, District Raigad, Maharashtra

(Phones : 02148-226617, 09273187434)

(e-mail ID: niliagromachines@yahoo.co.in)

### Profile

Age	: 60 years
Education	: 10 std
Landholding	: 3.6 ha
Farming experience	: 35 years
Crops grown	: Rice ( <i>kharif</i> and <i>summer</i> season), groundnut, bamboo
Livestock	: Buffaloes (12), back yard poultry and vermicompost

### Recognition

Chairman, of Rajnala Rice Seed Production and Nursery Co-operative Society, Vadap, Taluq Karjat

### Description of innovation

Modifications done in DRR Rice Drum Seeder (designed by Directorate of Rice Research, Hyderabad).

### Practical utility of innovation

The modified drum seeder was designed during May, 2009 and put to use in his own village *Vadap* on an area of 3 ha during June, 2009, besides area of 12 ha in nearby villages viz. *Sapele, Gaurkamat, Salokh, Ashivali, Dahigaon, Posari*. During *Kharif* 2010, farmers in nearby villages have sown rice with drum seeder on an area of 60 ha. Total 30 Drum Seeders were manufactured by the Farmer under the guidance of University Scientist and sold in nearby villages.





# Line Sowing of Minor Millets through Patta with Tines

**Shri Kamal Kishor Kashyap**

Village Bade Chakwa, Block Bastar, Chhattisgarh

(Mobile : 09329747574)

## Profile

Age	: 32 years
Education	: Graduation (Arts)
Landholding	: 3 ha
Farming experience	: 12 years
Cropping Pattern	: Paddy, ragi, maize, and vegetables
Livestock	: Bullock, duck, and poultry

## Recognition

Local leader and actively involved in social activities

## Description of innovation

Bastar tribals having a liking for minor millets and are growing them for their own consumption. Traditionally they are sowing seed by broadcasting in upland situations in fertile soil and yield is affected due to poor management of the crop. Line sowing of minor millets manually is tedious and time taking operation and women are mainly involved in this work. Farmer has made patta with tines for easy operation and reducing the drudgery. The patta was fixed with tines making 8-10 rows with seeds sowing and is operated by bullock or manually. This patta made with tines from one side is used for sowing of seed and for leveling from another side after line sowing of the seeds.

## Practical utility of innovation

It has reduced the drudgery upto 40% and improved the work efficiency with reducing the labour cost. It is light weight and women eco-friendly implement. This innovative technology is spreading horizontally in the farmers' fields who are cultivating minor millets in Bastar district.



Patta used in field



Vertical position of patta



Line sowing of ragi with patta



# Stacking of Vegetables Rolling and Stretching Type

**Shri Kalloo Ghorse**

Village Milanpur, Post Betul Bazar, District Betul, Madhya Pradesh

(Mobile : 08889705796)

## Profile

Age	: 38 years
Education	: Illiterate
Landholding	: 0.35 ha
Farming experience	: 14 year
Crops grown	: Tomato, cowpea, brinjal, bitter gourd and vegetable nursery

## Description of innovation

An Illiterate farmer of Betul developed the low cost, eco-friendly, handy stacking rods with stretching & rolling of iron wire for tomato and cucurbits cultivation. This device is made by welding and molding of iron rods at village level. They are using 6 mm. thick rods stacking and 10 mm thickness rods for rolling wheel.

## Practical utility of innovation

The iron wheel for stretching and rolling of iron wire and stacking rod are very innovative, low cost, easy to handle, labour saving, eco-friendly and very useful for vegetable growers. The total cost of stacking device is just Rs 35000/ha. It is a single time investment for 10-15 years with some write-off value. One day is sufficient for stacking of one acre area with two labours.



Farmers rolling wire



A field view of stacking



A View of Rolling & Stretching Device



# Sugarcane Bud Chipper

**Shri Rosanlal Vishwakarma**

Village Mekh, Block Gotegaon, District Narsinghpur, Madhya Pradesh

(Mobile : 09300724167)

## Profile

Age	: 41 years
Education	: 11 std
Landholding	: 3.2 ha
Farming experience	: 30 years
Cropping Pattern	: Sugarcane, Gram, Lentil, Soybean
Livestock	: IFS, cow and bullock pair

## Description of innovation

Developed sugarcane bud chipper had a half moon shape with sharp knife fitted in iron handle with spring system, which is manually operated. Pressing of handle, separated sugarcane bud by chipper and is also adjustable as per width of sugarcane.

## Practical utility of innovation

Innovative sugarcane bud chipper is simple to operate and portable. This bud chipper could be able to separate 300-500 bud/hour. It requires 90% less seed material, 13q of buds for sowing in place of 125 q as in traditional practice of sowing sugarcane sets. Raw material of seed (112 q, cost Rs 33600/ha) after separating the buds can be utilized for making gur and sugar. Germination percent of sugarcane bud is 40 per cent higher as compared to traditional system of planting (30%). Many sugarcane growers are interested and lot of demand developed for this device. The farmer could sell 1500 such devices @Rs 1000.



Sugarcane bud Chipper



Working of Sugarcane bud Chipper



# Modified Wheat Seed Drill for Line Sowing in Soyabean

**Shri Randheer Singh Yadav**

Village Motwa Barchua, Tehshil Devendranagar, District Panna, Madhya Pradesh

(Mobile : 09752058962)

## Profile

Age	: 53 years
Education	: 8 std
Landholding	: 5.6 ha
Farming experience	: 22 years
Crops grown	: Soybean, urid, sesamum, wheat, gram and lentil
Livestock	: Buffaloes (6)

## Recognition

Sarpanch of the village panchayat

## Description of innovation

Many farmers used to sow the soyabean seed by broadcasting method. Some farmers used to do line sowing with traditional wheat seed drill, but they faced problems of poor germination, poor plant growth due to accumulation of water near collar region of plant. Therefore, they were not in a position to use wheat seed drill for soyabean. Thus, Shri Randheer Singh Yadav made slight adjustment in traditional wheat seed drill with a hand made broad leaved blade which is of triangle shape incorporated in hind row of seed drill and sowing was done from seed drill front row only.

## Practical utility of innovation

This innovation requires just Rs 280. It is suitable for both conditions moisture stress as well as water stagnation. Through this modification one can easily maintain proper spacing (45 cm) in soybean. This method is least affected by heavy rainfall if it occurs just after sowing. Average increase in yield in this method is 61.73%.



Innovation of traditional seed drill



Farmers at ridge furrow sown field



Director ZPD Zone VII along with other dignitaries at farmers field



# Interculture Plough for Cotton

**Shri Harish Ch. Sabara**

At Danduguda, P.O Bhagasala, District Rayagada, Maharashtra

## Profile

Age	: 35 years
Education	: 9 std
Landholding	: 2.4 ha
Farming experience	: 10 years
Crops grown	: Cotton, vegetables, paddy and arhar
Livestock	: Backyard poultry

## Recognition

Village leader

## Description of innovation

This plough is designed to be operated in cotton fields for weeding and hoeing. It has three bottoms/ tyres made of iron spaced apart by 90 cm. to suit spacing in cotton. A wooden bar of 8-10 cm diameter. is fixed at angle of 45° with the plough, similarly as in conventional desi plough. Handles are fixed in the plough for lifting it from one place to other. It can be manufactured by help of a local blacksmith.

## Practical utility of innovation

In rainfed upland weed is a severe problem for kharif cotton. Hoeing and weeding operation for 3 acres can be completed by one man day at 30 DAS and 45 DAS as compared to one acre by traditional desi plough. It saves labour time and is cost effective without any maintenance cost. It saves around Rs 2500/ha towards labour involved in hoeing and weeding in traditional method. Cost of this plough if manufactured by local blacksmith will be around Rs 3000.



Indigenous plough for hoeing and weeding



Inter culture plough in operation



# Marker for SRI Method of Rice Cultivation

**Shri Ramachandra Patrasaura,**

At Pabliguda, P.O Dasmantpur, District Koraput, Odisha

## Profile

Age : 44 years  
Education : Under Matriculate  
Landholding : 1.4 ha  
Farming experience : 20 years  
Cropping Pattern : Paddy, finger millet, niger, groundnut, arhar, french bean and tomato  
Livestock : Cattle and poultry

## Recognition

Non-formal teacher (1989-99)

## Description of innovation

Developed Marker is a low cost marking device for SRI method of rice cultivation. This locally made Marker is easily portable and very cheap in comparison to Marker developed by Agro industries. It is developed by using old Bicycle Rim, four pieces of bamboo stick and rope. It is operated manually. It marks points at a spacing of 25 cm in a line which is required for SRI paddy cultivation.

## Practical utility of innovation

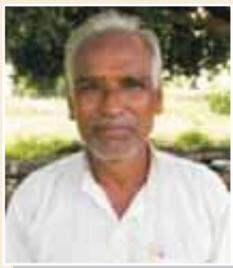
Marker for SRI paddy is a low cost implement. The device is very useful in hilly and terrain areas particularly when the paddy field is far away from the farmers house. This locally made Marker is very cheap, easy to make, portable and good substitute for Marker available in the Market. The cost of the device is Rs 150.



SRI marker



SRI Paddy by using marker developed by the farmer



# Cotton Ridger

**Shri Durga Charan Pradhan**

At Bangalipada, P.O Kikia, Via Utkela, Block Kesinga, District Kalahandi, Odisha  
(Mobile: 09583474582)

## Profile

Age	: 62 years
Education	: Matriculation
Landholding	: 8.4 ha
Farming experience	: 40 years
Crops grown	: Paddy, Cotton & Pisciculture
Livestock	: 2 cows & 4 bullocks

## Recognition

Technical consultant for cotton ridger

## Description of innovation

Cotton ridger is made up of wooden plough like structure with a specially designed iron shovel attached to it. The shovel consists of two curved iron sheets which are vertically attached to both sides of the wooden base of the plough, in such a way that it turns soil to both side when ploughed. It is operated by two persons after hitching it with pair of bullock. The shovel has been designed as per the row spacing of the cotton crop.

## Practical utility of innovation

In cotton cultivation earthing up is the most crucial, tedious and expensive operation. But with the help of this implement the operation is much easier and labour saving. Generally 12-15 persons are required for earthing up of 1 acre of cotton crop which costs around Rs 1200 to Rs 1500. But with this cotton ridger 2 persons and a pair of bullock are sufficient for earthing up of 0.8 ha of cotton field in a day with an expense of Rs 750/ha. The height and width of the ridge made by cotton ridger is more as compared to the ridge made manually, which helps in conserving more moisture and better plant growth.



A view of Cotton Ridger



Cotton Ridger ready for operation



Operation of Cotton Ridger



## Durai's Modified Cono Weeder

**Shri Durai**

Siruvai, Veedur Post, Taluq Vannur, District Villupuram, Tamil Nadu  
(Mobile: 09751582066)

### Profile

Age	: 38 years
Education	: 10 std
Landholding	: 7.5 ha
Farming experience	: 25 years
Crops grown	: Paddy and pulses

### Recognition

SRI member, TNAU

### Description of innovation

Durai's Modified Cono Weeder for SRI system is manually operated. It has one serrated round rotor with 30 cm x 1.4 m dimensions and 2.5 kg weight. The serrated blades mounted with specified groove of central axis will help to increase or decrease the height of the rotors based on mud tightness. The removed weed is effectively incorporated in to the mud.

### Practical utility of innovation

Manual weeding even in SRI system gets extended beyond the defined period of weeding due to non availability of labour. Cono weeder models available are not helpful in limiting the weeds, better aeration to roots and enhance the tillering. Durai's Modified Cono Weeder is capable of removing weeds and *insitu* incorporation of the same, further facilitating continuous operation. It is easy to handle, cover 0.20 ha per day, reduces 13 labour cost per weeding, easy to operate due to its light weight and suitable for all types of soil. Cost is Rs 500 and B:C Ratio is 1:4.45.



View of modified cono weeder



Field operation with modified cono weeder



# Tractor Operated Farm Waste Shredder

**Shri K. Natarajan**

Neermadai Thottam, Post Uthavipalayam Chinna Negamam,  
Pollachi, District Coimbatore, Tamil Nadu (Phones. : 04529-245064, 09976543756)

## Profile

Age	: 62 years
Education	: Matriculation
Landholding	: 8.4 ha
Farming experience	: 40 years
Crops grown	: Paddy, Cotton & Pisciculture
Livestock	: 2 cows & 4 bullocks

## Recognition

Technical consultant for cotton ridger

Developed machine is effective to chaff all farm wastes and help the farmers to generate organic manure at their farm level. It was demonstrated at Chinna Negamam (Collectorate), Pollachi (NGM College), Vivekanandapuram (KVK, Coimbatore) and it was covered in mass media like Dinamalar Newspaper, Raj T.V. and Mega T.V.

## Description of innovation

Tractor operated farm waste shredder developed by Shri K.Natarajan could able to cut farm waste like banana pseudo stem, coconut fronts etc into small pieces. Shredder consists of 6 heavy blades and has rotary speed @ 1500 RPM. Principle of shredder is rotary movement action of blades. It has dimensions of 2000mm x1250mm x1150 mm, hopper dimensions 450 mm x 300 mm and weight 325 kg. Tractor with 35 hp and above power – driven is required for operation of Shredder.

## Practical utility of innovation

Disposal of farm waste like banana pseudo stem, coconut fronts etc., is a laborious process at farm level. Tractor operated farm waste shredder helps to convert farm waste (dry and wet) effectively into organic manure at farm level with less time and low cost. It benefits Rs 7500/ha. Shredder cost is Rs 100000. Average of 3 to 4 shredders per month supplied. So far 150 farmers are using the shredder.



A view of tractor operated farm waste shredder



# Cage Wheel Type Manual Weeder for SRI

**Shri Shanmugasundaram**

Village Kalleripatty, Taluq Attur, District Salem, Tamil Nadu

(Mobile : 09442782142)

## Profile

Age	: 42 years
Education	: 7 std
Landholding	: 2.8 ha
Farming experience	: 26 years
Crops grown	: Paddy, coconut, banana, coleus and vegetables
Livestock	: Milch animals, poultry and goat

## Recognition

President of the Coconut Producers Association and Coconut Precision Farmers Association

## Description of innovation

Cage Wheel Type Manual SRI Weeder for Clay Soils developed by Shri Shanmugasundaram consists short handle (3 ft), long wheel (5ft diameter) and height (15 ft) weighing 10 kgs. It is adaptable, eco and gender friendly and efficient as compared to SRI weeder.

## Practical utility of innovation

Developed Cage Wheel Type Manual SRI Weeder penetrates into high clay type of soils and removes the weeds very easily and efficiently. Weeding operation becomes easier when compared to the original SRI weeder and also reduces damage to the roots. B:C Ratio is more as compared to the original SRI weeder which is popular among farmers. Shri Shanmugasundaram is earning an amount of Rs 15000 /season by hiring Cage Wheel type Manual SRI Weeder for Clay Soils to other farmers. Further, this implement is being spread to other farmers in local village, nearby villages and other districts.



A view of Cage Wheel Type Manual SRI Weeder for Clay Soils



Weeding operation in clay soil through Cage Wheel Type Manual SRI Weeder



# Marker for Transplanting in SRI

**Shri S. Balaguru**

Vettaithidal, Post Karunavoor, Taluq Mannargudi, District Thiruvarur, Tamil Nadu

(Mobile : 09442525236)

## Profile

Age	: 47 years
Education	: 9 std
Landholding	: 8 ha
Farming experience	: 30 years
Crops grown	: Paddy and cotton

Farmers normally use marked ropes or marker for making line spacing in SRI of paddy transplantation. While using marked ropes, it is highly difficult to follow the uniform lines since lines change after some time even though two labourers keep rope. While using Marker, markings are partially hidden and difficult to find the exact point to plant. These drawbacks are rectified in SRI marker developed by Shri Balaguru and also it is cost effective.

## Description of innovation

Portable Simple SRI Marker is made up of 1" PVC pipe in triangle form and its length is 3.75 feet with marking of 22.5 cm uniform spacing. It is handy, weightless, portable and can be easily taken from one place to other.

## Practical utility of innovation

In the normal marker the marking is partially hidden and it is difficult to find the exact point of place at where planting has to be done, especially in heavy clay soil. One labour can simultaneously rotate the marker and plant the seedlings easily. Precision of space can be maintained uniformly throughout the entire field by using Portable Simple SRI Marker. Further, it is easily rotated by a labour and hence the labours are not experiencing any drudgery. Normally under SRI system, for taking up planting of one acre 12 labours are needed for 8 hours. By using this marker only 6 labour is enough to complete the planting with perfection. Cost is Rs 350/unit. In Vettaithidal cluster village alone 740 ha are cultivated under SRI and 230 ha are transplanted using this marker.



A view of portable simple SRI marker



Transplanting paddy using portable SRI marker



# Instant Cooler for Tender Coconut Water

**Shri M. Vinod**

Bheemasandra, Taluq C.N.Halli, District Tumkur, Karnataka

(Phones : 09448357536, 09972556749)

## Profile

Age	: 38 years
Education	: B.A.
Landholding	: 8 ha
Farming experience	: 9 years
Crops grown	: Coconut, arecanut, paddy, ragi, and jowar
Livestock	: Murrah buffalo and hybrid cows

## Recognition

Director, Samruddhi Savayava Krishi Parivara, Handankere Hobli, C.N.Halli

## Description of innovation

Tender coconut water cooler consists 1.5' X 2.0' X 2.0' sized steel box, thermo coal pith/sheet, sand, ice cubes, soft plastic pipe, funnel, filter and tap. The steel box is insulated all inner sides with thermo coal pith/sheet. The base of the box is filled with 0.5 feet sand layer. Large ice cubes are placed on the sand layer. Three meters of 0.5 inch soft plastic pipe is placed in between the sand layer and ice cubes. Tap is fixed at one end of the pipe and the funnel is attached with filter in another end of pipe. Fresh tender nut is cut open and poured into funnel. Tender nut water is filtered and slowly passes through the plastic pipe between sand and ice cubes and comes out through out let tap as cool/chilled. Process takes one minute for one tender coconut.

## Practical utility of innovation

This cooler helps farmers to sell chilled/cooled tender coconut water instantly that can get good price and avoid interference of middle man. Further, it is possible to add ingredients like ginger, masala powder etc. for taste.



Instant cooler for tender coconut water



# Coconut Palm Climbing Device

**Late M.J. Joseph**

Muthukulathil, Post Puranjan, Chemberi, District Kannur, Kerala

[Mobile (His nominee): 0460-2213655 ]

## Profile

Age	: 92 years
Education	: 4 <sup>th</sup> class
Landholding	: 6 acres
Farming experience	: 65 years
Crops grown	: Coconut, arecanut, pepper, tapioca, paddy

## Recognition

He was a part of freedom movement of India

Innovator received cash awards of Rs 750 from CPCRI and Rs 15000 from NRDCI. He was honoured as Distinguished Agricultural Inventor (DAR) by KAU.

## Description of innovation

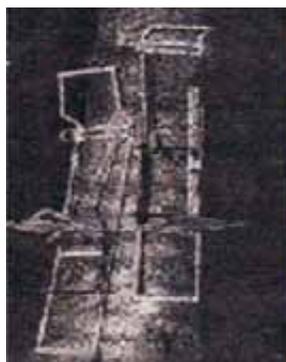
A simple device designed in 1970's that made a revolution in coconut gardens all over Kerala and other states for climbing coconut trees easily. Device consists of wire ropes, rubber covered iron rings, two pedestals provided on two iron ladders fixed with these rings. After fitting this device to tree, the climber stands on the pedestals, upper ring is then loosened slightly, device gets lifted by the handles provided on it. To get down the same rings are loosened and the handles operated. This device got patented (Patent No. 147172).

## Practical utility of innovation

This innovation has shown the way that coconut climbing is possible to any one including women and children. Many young people took climbing as a profession for one of the sources of income by operating this device. Cost of one device is Rs1300 now. On an average 500 devices are sold per year. This innovation is very popular among farmers, farmer organizations and various agencies.

## Concept

Made rings fitted with rubber belt with wire rope of 3.5 mm. Two main and two sub-loops are made for each leg. Pedestals fitted with handles in the upper side by using steel bars of 10 mm diameter. These pedestals are fitted to the ring. Device work according to the weight operator exerted on it, when weight is applied on the pedestal, it comes down and the device gets tightened to the trunk.



Coconut palm climber



Climbing with coconut palm climber





# Poly Bag Filling Device

**Shri Simon George**

Palamoottil House, Post Karippal, Perumpadavu, District Kannur, Kerala

(Mobile : 09495728733)

## Profile

Age	: 50 years
Education	: 10 std
Landholding	: 0.8 ha
Farming experience	: 30 years
Crops grown	: Coconut, arecanut, banana, pepper
Livestock	: Dairy cattle

## Recognition

SAC member of KVK, Kannur

## Description of innovation

Developed device consists of a funnel made of zinc sheet having 18 gauge thickness and 36 inch diameter on the upper and 11 inch diameter at the lower end. This funnel is connected to a galvanized iron pipe having 1.25 inch diameter and 26 inch length in a slanting position fixed to an iron table of 15 inches square shape with 10 inches height. Poly bag is opened and kept under the funnel. The potting mixture filled to the funnel falls directly to the poly bag. Container for taking potting mixture to funnel is made of tin.

## Practical utility of innovation

Poly bag filled with potting mixture is widely adopted in nurseries



Device for Poly bag filling with potting mixture

for plant propagation. Manual filling of poly bag is laborious and time consuming as well as expensive too. In normal method, one labour can fill 125 poly bags of size 55 x 25 cm whereas with the help of this device, 2 labourers can fill 1000 bags a day. Further, potting mixture fed to the funnel falls down to the opened poly bag correctly without any wastage as in the case of manual filling. It does not require electricity or other fuels and it is portable. This device is adopted by 117 nurseries successfully so far.

## Documentation

Presented the innovation in first Farmers Science Congress held at KVK, Kannur from 4 - 5 February, 2008. Displayed in the exhibition associated with first Farmers Science Congress and also displayed in Farmers' Science Museum at KVK Kannur and received a certificate. Published in the proceedings of first Farmers Science Congress and also published as success story in newspapers.



# Water Lifting Device for Open Well

**Shri Heramb Ganapathi Batt**

Post Jagannahalli, Taluq Sirasi, District Uttar Kannada, Karnataka

## Profile

Shri Herambha Ganapathi Bhat, a small farmer from Jagannahalli village in Sirsi Taluk, Uttara Kannada District had an ambitious idea to simplify drawing water from domestic wells. He struck up on this idea to help his aged parents to draw water with ease and without the help of electricity or fossil fuel. The equipment is cost effective, easy to construct, maintain and user friendly. Even women, children and aged can operate this with ease.

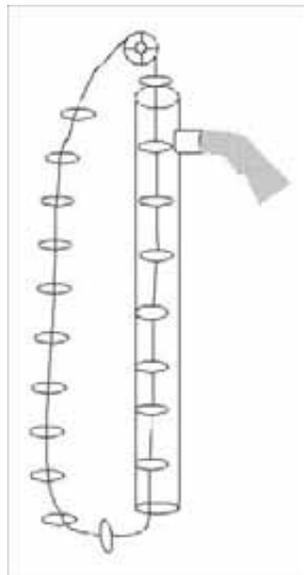
Received Best Innovative Farmer award during Krishi Mela (2004-05) from University of Agricultural Sciences, Dharwad. Included farmer name in National Register of Grassroots Technological/ Traditional Knowledge/ Ideas, NIF, Ahmedabad.

## Description of innovation

The PVC pipe used as suction pipe which is fitted to one side of the well wall. Nylon rope knotted at 6 feet distance is fitted with rubber washers made from old tyre rubber at every knot. Entire nylon rope and washers are drawn from the suction pipe and is run over a normal iron well pulley and knotted to the other end forming a full circle. It works on the principle of Vacuum Piston Pump. When the nylon rope is pulled, water is drawn into the pipe by every interconnected washer and lifted to the top of the well. This device gives the continuous flow of water at the receiving end, because of interconnections of washers at regular intervals.

## Practical utility of innovation

It can lift water to a height of 65 feet. It works based on estimation about pressure requirement, required materials, length and width of the pipe, water density, and it's out forcing. Approximate cost is Rs 300 per unit and varies with the depth of the well. Since it is cost effective many farmers are coming forward for adopting this device.



Water lifting device from open well



# Rat Proofing Technique

**Shri Tech Bida**

Village Dev, Sangalee, District Papumpare, Arunachal Pradesh

(Mobile : 09436229537)

## Profile

Age	: 58
Education	: Illeterate
Landholding	: 40 ha
Farming experience	: 45 years
Crops grown	: Paddy, maize and orange
Livestock	: Mithun, piggery and poultry

## Recognition

A man of high status in tribal society.

## Description of innovation

Rat proofing techniques made of CGI Sheet and Wooden plank which are being encircled with the post and pillar of the storage house to prevent rat attack. The granary of the tribal farmers is built on raised platform to keep the paddy grains.

## Practical utility of innovation

The CGI sheet after cutting in an appropriate size are placed on the pillar of the Granary (Usually consist of 9 Nos. of pillars). A hole is made on the centre of the wooden plank and inserted on the post in the time of granary construction. An individual can carry out the above activities without engaging the labours and does not require much time to do the same. The farmers of the region have been benefitted the most with this innovation. There is significant reduction in storage losses of the storage grain (about 80% losses has been saved). This innovation has been widely adapted in every village of the district by the tribal farmers.





# Rice Grinding Machine

**Shri Bakul Chandra Das**

Village Basanta, P.O Trimohini, P.S. Hilli, District D. Dinajpur, West Bengal

## Profile

Age	: 27 years
Education	: 10 std
Landholding	: 0.4 ha
Farming experience	: 5 years
Crops grown	: Paddy and jute
Livestock	: Backyard poultry

## Recognition

Known as innovator in machinery

## Description of innovation

In the conventional *Atta Chakki* rice is crushed in between two stone made *chakkies* which generate enormous heat as well as produce inferior quality of rice dust, not suitable for preparing rice cakes and other products. In the developed machine no *chakki* is required for grinding rice, instead mild steel bar fitted against two places serve the purpose. To get the desired quality, rice is soaked into water for two hours, excess water is drained out and wet rice is put in the grinder. The machine rotates at 3000 rpm and can grind 200 kg of wet rice in an hour. In spite of higher rpm, the machine generates mild heat (10-15 degree Celsius) against 45-50 degree Celsius of traditional grinding machine.

## Practical utility of innovation

The developed *atta chakki* has the ability to run for hours for grinding wet rice. The steel bar fitted reduces the heat as well as increases rpm for production of fine rice dust. Steel being more durable than the stone helps in increasing the life span of the grinder. Wear and tear is also minimum in the developed *chakki*. The cost of the developed machine is also less (Rs 15000) than the conventional one (Rs 20000). The developer of the machine is trying for the patent of the grinder.



A view of modified wheel



Full view of the machine



# Cost-effective Drier (Bhatti) for Large Cardamom

**Shri Yogendra Kharga**

Tari goan, Bongbusty, Kalimpong, Darjeeling, West Bengal

(Mobile: 09002929342)

## Profile

Age	: 40 years
Education	: 8 std
Landholding	: 2 ha
Farming experience	: 12 years
Crops grown	: Paddy, maize, vegetable and fruits
Livestock	: Poultry

## Description of innovation

The bhatti is usually made up of stone from all sides with one side open to facilitate heating. On top of the fire place (Bhatti), mesh tray is kept for spreading cardamom. The top may be covered either with thatched roof or GI sheet or may be kept uncovered. It is designed in such a way to ensure easy passage of smoke and heat from all the sides of the bhatti.

## Practical utility of innovation

The bhatti is prepared in a manner to facilitate uniform drying of cardamom without burning. It ensures the passage of heat from all the side to make cardamom dried properly. It involves minimum drudgery and cost and can easily be practiced by the women. It has the capacity to run 30-40 hours continuously and can dry 400-500 kg of freshly harvested cardamom. The ratio of raw to dried capsule is generally 5:1. It has become a household practice in the hills of Darjeeling.



Curing of large cardamom through bhatti



# Use of Sprinkler as a Cooler for Litchi Orchards

**Shri Sudhanshu Kumar**

Village & P.O Nayanagar, District Samastipur, Bihar

(Mobile :0919934917017)

## Profile

Age	: 47 years
Education	: Post-Graduate
Landholding	: 8 ha
Farming experience	: 21 years
Crops grown	: Paddy, maize, fruit crops, wheat and vegetables
Livestock	: Poultry and cattle

## Recognition

Awarded with Kishan Bhusan, Gram Gaurav Samman and many other recognitions

## Description of innovation

Building favourable micro-climate in the orchard is the key to this innovative idea. Besides the installed drip irrigation system, micro-sprinklers are installed in the orchard to control or build favourable micro-climatic condition for the proper growth of litchi. The micro-sprinklers need to run on a regular basis and if required, continuously for 3-4 days during 'Loo' or 'pachia' (hot whirling wind) condition. To create such micro-climate in an orchard of 6 ha, 1100 micro-sprinklers are required. Water is continuously sprayed in the periphery of the orchard to create proper microclimate.

## Practical utility of innovation

Prolonged dry and hot climate during reproductive stage of litchi causes severe loss in production. In spite of having irrigation facility, the litchi growers of Bihar, particularly in Muzaffarpur region, failed to harvest litchi during 2008-09 due to drought like situation. Shri Sudhanshu Kumar came up with a unique idea to save the orchards (litchi) from losses. The commercial growers of litchi are already in a process to install the system in their litchi orchards. An orchard of 6 ha provided a net profit of 6 lakh during 2008-09 by creating favourable micro-climate when the litchi growing districts were declared as drought hit districts.



A view of sprinkler irrigation



Application of water in plant periphery



Harvest of litchi



THEMATIC AREA 6

# WATER MANAGEMENT



# Micro Sprinkler

**Shri M. Avaran**

Mannackkara House, Athavanad, District Malappuram, Kerala

(Mobile : 09446840750)

## Profile

Age	: 58 years
Education	: Primary
Landholding	: 2 acres
Farming experience	: 42 years
Crops grown	: Rice, banana, coconut, arecanut and vegetables
Livestock	: Back yard poultry, rabbit rearing and ornamental fish

## Recognition

President of Haritha sangam, Athavanad and Secretary of Athavanad Padashekham

## Description of innovation

A new micro sprinkler by Shri M. Avaran is from commonly available 3 mm diameter micro tubes, a kerosene lamp and an old razor blade. Micro sprinkler is developed by fusing one end of the 3 cm long micro tube and making an incision just below the fused end. Discharge rate of the 3 cm long micro sprinkler comes to 90 lph at the normal operating pressure of 1 kg/cm<sup>2</sup> which produce half circle jets of 1m diameter. Received certificate from Department of Agriculture, Government of Kerala and appreciation from Kuttippuram Block Panchayath.

## Practical utility of innovation

Micro sprinkler is adaptable for all types of crops like plantation crops, fruits and vegetable. Water use efficiency increases with this micro sprinkler and thereby decreases the cost of irrigation. This sprinkler is economically viable because the cost comes to only Rs 2, while the drip emitters cost aroundRs18 (for 3 Nos.). It is gender friendly. Clogging of drip emitters could be managed by this micro sprinkler. A total of 250 farmers adopted micro sprinklers and laid out in 200 acres. Benefit - Cost Ratio is 3.29.



Spraying pattern of Avaran's micro sprinkler



Avaran's micro sprinkler laid out in banana field



# Chandrababha's Rain Gun-sprinkler System with Modified Nozzel Size

**Shri Annasaheb Udagavi**

Post Sadalaga, Taluq Chikkodi, District Belgaum, Karnataka

(Mobile : 09342212732)

## Profile

Age	: 82 years
Education	: Illiterate
Landholding	: 20 acres
Farming experience	: 70 years
Crops grown	: Beetle vine, tobacco, and sugarcane

## Recognition

Sugarcane is one of the major crops grown in Belgaum district. Poor irrigation and quite often excess irrigation is an eternal problem with sugarcane farmers. Pest management is another constraint farmers struggle to deal with. Shri. Annasaheb addressed both water and pest management problems by designing sprinkler head.

## Description of innovation

Developed Raingun has a special LOPS nozzle which covers applying water over long distances and for short distances. Also, there is a provision to choose nozzle size: 17, 19, 21 and 23 mm to achieve the required throw distance. For instance, a 17 mm nozzle throws water up to 100 feet radius while a 23 mm nozzle can throw water up to 140 feet.

## Practical utility of innovation

Innovative Raingun saves 60 to 70 % water. Hence, it is possible to increase the irrigated area by more than two times using the same amount of water. Along with irrigation, the sprinkler can be used for application of fertilizers and plant protection chemicals simply by mixing them in the water tank. This can save a great deal of labour expenditure. More importantly, since the Raingun has a three-inch pipe and a wide nozzle, even liquid composts such as biogas slurry can be applied to the crop. Since the water is applied with force, pests like aphids, white flies, scales etc., are effectively washed down.



Chandrababha Rain Gun-Sprinkler System



Chandrababha Rain Gun-Sprinkler System in the field



# Use of Micro Irrigation System in Field Crops

**Dr Dattatray Wane**

At Post Manori, Taluq Rahuri, District Ahmednagar, Maharashtra  
(Mobile :09822274226; e-mail : dr.dattatrayvane@yahoo.in)

## Profile

Age	: 50 Years
Education	: BAMS
Landholding	: 5
Farming experience	: 30
Crops grown	: Sugarcane, onion, wheat, sorghum, gram, sunflower, pigeon pea, green manure
Livestock	: crossbred cows, sheep, goat

## Recognition

Director, Babu Rao Tanopwar Sugar Factory, Village Sarpanch Member, Milk coop.society, Water mgt.Society

## Awards

- *Sahyadri Krishi Sanman* 2008 by Mumbai Doordarshan
- *Zee Sanman (Krishi)*, 2008 by Zee 24 Tas, Mumbai

## Description of innovation

Mr. Dattatray Wane adopted the drip and sprinkler irrigation techniques as per situation in crops like onion, wheat, chickpea, sugarcane thereby increasing the water use efficiency,

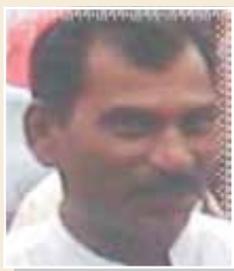
- Developed the Wane model for efficient water management
- Developed precision farming technique, conducted farm trials & field experiments on his farm
- Improved scientific methods of crop selection, rotation, planting etc.
- Practiced scientific storage system
- Delivered lectures on water management, organized field days & field visits of farmers on his farm and guided other farmers.

Cost benefit/profitability-Increased C:B ratio of crops grown in the field.

Labour and time saving-Assisted in labour & water saving by adoption of improved irrigation techniques.

Drudgery reduction- Use of precision farming techniques has reduced drudgery.

Adaptability across the system- The Wane model is being widely adopted by other farmers of the region.



# Alternate Spacing in Cotton for Cost Effective Drip Irrigation

**Shri Ghawate Arjun Sarjerao**

Satana, District & Taluq Aurangabad, Maharashtra

(Mobile : 09422291285)

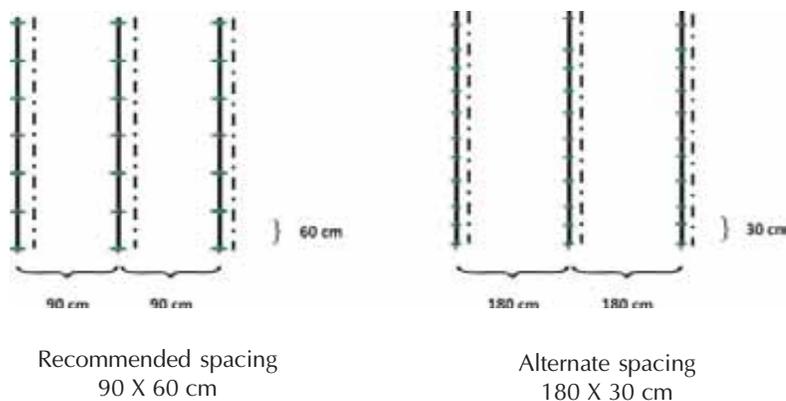
Profile	
Age	: 70 years
Education	: Matriculation
Landholding	: 16 ha
Farming experience	: 43 years
Crops grown	: Paddy
Livestock	: Buffaloes (12), back yard Poultry and vermicompost

## Description of innovation

Shri Ghawate Arjun has innovated new plant spacing without change in recommended plant population under drip irrigation in cotton. As recommended plant spacing for cotton is 90x60 cm, which requires 111 lateral per ha, instead of that 180x30cm plant spacing has been innovated by him. Which requires 50% less i.e. 55 lateral per hectare.

## Practical utility of innovation

Changed plant spacing i.e.. 180 x 30 c.m. reduces 50% cost on lateral, which helps better aeration in between two rows. As wider spacing, intercrop like green gram, black gram, soybean etc. can easily be taken in cotton, which gives additional income to the farmer. This type of drip irrigation structure was cost effective and gave better crop yield (17 to 18% more) against the traditional practices and recommended drip. Total 400 farmers has adopted this echnology over 260 ha.





# Refined Drip Irrigation System

**Shri Vishwanath Tatyasaheb Patil**

At Post Ambap, Taluq Hatkanangale, District Kolhapur, Maharashtra

(Mobile : 09823183833)

## Profile

Age	: 46 years
Education	: Degree
Landholding	: 5.23 ha
Farming experience	: 23 years
Crops grown	: Sugarcane, banana, groundnut, soybean, bengal gram, vegetables and fodder crops
Livestock	: Cattle and goatary

## Recognition

Recipient of State level 'Oosbhushan' award for highest sugarcane yield in the state, Vasantrao Naik Krishi Puraskar award, Chh. Shahu award for agriculture development.

President of Farmer Scientist Forum, KVK, Kolhapur. and Krishi Vigyan Mandal, Ambap.

Ex member of extension advisory committee of MPKV, Rahuri.

## Description of innovation

Drip irrigation system is modified through refinement as per the need of different crops. The spacing between two rows of drip lines and the distance between two drippers and type of drippers is changed and the system is fully utilized for increasing yield of field crops and maintaining soil health. The diameter of drip line and also rate of discharge of water from dripper is modified in such a way that it is best fitted to each crop. This modification is made without disturbing assembly by maintaining optimum water pressure so that release of water at root level of each plant will be as per requirement.

## Practical utility of innovation

The technology is labour saving, easily adaptable, gender friendly with maximum water use efficiency which has enhanced productivity of different crops. The technology is best suited to different crops and intercrops like sugarcane, banana, soybean, groundnut, bengal gram and vegetables with easier fertigation applicability. The drip system is economically viable with cost of Rs 62,000/ha having 10 years life so that per year price comes to Rs 6200/ha. However, the increase in net profit went higher upto Rs 55,000/ha than initial. The method of changing spacing between drip lines and drippers along with their size and type and capacity of water discharge found to be highly useful in different crops with inter crops. The system resulted in saving of three nationally important wealth; water, fertilizer and electricity.



Crop performance in the field through refined drip irrigation system



# Jute Retting in Shady Area – An Alternate Approach

**Shri Nur Alam**

Village Kasba, Post Baharal, PS Ratua, District Malda, West Bengal

(Mobile : 09775477051)

## Profile

Age	: 29 years
Education	: 5 std
Landholding	: 1.6 ha
Farming experience	: 10 years
Crops grown	: Jute, paddy and vegetables
Livestock	: Poultry and duckery

## Description of innovation

In the district of Malda a large number of sizeable orchards are available keeping the inter space vacant. In this method trenches are dug of 25-30 feet long and 5-6 feet wide to make it as water harvesting structure. Trenches were prepared in such places where mild slope/gradient to make the flow of rain water in the desired direction. Rainwater is stored in these trenches during rainy season which is used for retting of jute in the shade of the orchards.

## Practical utility of innovation

Besides feeling comfort during retting under the shade, the farmer harvested quality fibre also from the rotten jute as the water quality is better than the ponds and other places. Even during less rainfall years, collection of water is possible in such structures when ponds and other water bodies dry up.



Collection of water in trenches



Retting of jute in collected water



# Modified Lift Irrigation System for Enhancing Water Discharge

**Shri Tarapad Mahto**

Village Palani, Block Baliapur, District Dhanbad, Jharkhand

## Profile

Age : 66 years  
Education : Illiterate  
Landholding : 3.4 ha  
Farming experience : 50 years  
Livestock : Poultry and piggery

## Recognition

Leader of Farmers Cooperative Society

## Description of innovation

By lifting the out-let irrigation pipe up to 6-7 feet with support of bamboo, the flow of discharge was increased to a certain extent. Lifting the outlet pipe further (up to 30 feet) with support of bamboo and iron angle, the discharge of water was further increased and consumption of diesel was reduced to 25%. The modified approach drew the attention of district administration and the system was reinstalled with 8 HP electric motor with an alternate 5 HP diesel motor and 30 feet lifted pipe with the support of iron angles. The simple modification of the existing lift irrigation system has been possible due to Mr. Tarapad Mahto, a tribal farmer of Dhanbad district.

## Practical utility of innovation

Vegetable cultivation in the upper altitudinal areas of Baliapur block, Dhanbad district almost came to an end due to paucity of irrigation water. Though a sizeable land and production of vegetables were observed in the past, non availability of water forced the farmers to stop vegetable cultivation. The alternate method of lift irrigation has not only assured water for vegetable cultivation but also helped the farmers earning adequate profit out of vegetable cultivation.



A View of Lift Irrigation of Sri Tarapad Mahto



# Alternate Irrigation for Cashew Cultivation – An Innovative Idea

**Mr. Sanjay Mahato**

Village Baraghong, P.O Jamboni, Block Jamboni  
Dist. Paschim Medinipur, West Bengal

## Profile

Age	: 34 years
Education	: Matriculation
Landholding	: 4.5acre
Farming experience	: 13 years
Crops grown	: Paddy and vegetables
Livestock	: Poultry and duckery

## Description of innovation

In the innovative method, pitcher irrigation has been replaced with the plastic bottle of 1 litre water capacity tied to the plants. The bottles are filled with water in every week to ensure the water availability to the newly grown cashew plants. This simple modification brought down mortality rate to 4-5%. Moreover, earthen pitchers are costly, less durable and not easily available in the market. Replacement of pitchers with plastic bottle reduced the cost of cultivation (Rs. 11,000 per ha) with assured availability and durability.

## Practical utility of innovation

In the newly planted cashew, generally FYM @ 5 kg per plant is used both as nutrient and mulching materials with pitcher irrigation during water stress condition. A large area has been brought under this new method and district Horticulture Department is in the process of large scale dissemination of this technique. Area expansion through cashewnut cultivation in the wasteland of Midnapore district by National Horticultural Mission received setback due to prolonged drought like situation and ineffective mulching and irrigation systems. The innovative idea has helped in area expansion under cashew cultivation.



Use of plastic bottle for irrigation



A view of cashew plant



THEMATIC AREA 7

# LIVESTOCK AND FISHERIES MANAGEMENT



# Treatment of Mange in Pigs

**Shri Ram Kishan**

Village Jamalpur, P.O Gundiana, Tehsil Jagadhari, District Yamunanagar, Haryana

(Mobile: 09812881260)

## Profile

Age	: 34 years
Education	: Matriculation
Landholding	: 2 acres
Farming experience	: 7 years
Crops grown	: Wheat and green fodder
Livestock	: Buffaloes

## Description of innovation

Mange is an irritating disease and its treatment is very expensive which is not followed by pig farmers. This farmer tried diesel + phenyl for its control as external application on the affected parts of body. This innovation controlled all kind of mange within 3 days of application in pigs and it is also cost effective. Pure diesel + phenyl (1 lit. diesel + 100 ml phenyl) is mixed together and sprayed with mini spray pump or applied by gunny bags on the body of pigs once only. The same process is repeated after 15 days as per the need.

## Practical utility of innovation

Diesel and phenyl have antiseptic and antibacterial properties. Diesel also gives a shining to the body. Physically, there is no side effect in treated animals. It is very effective to control all kinds of mange within 3 days in pigs at very low cost. The cost of application is less than that of other drugs. The most important effects, however, are improvement in feed efficiency and in daily live weight gain depending on severity.



Pig infected by Acute mange



A Mange free piglet after treatment



# Pure Breed Stock of Sheep and Goat

## Shri Veerakempanna

Village Anoor, Taluq Sidlaghatta, District Chikkaballapur, Karnataka

(Phones : 08158-256117, 09449730563, 09986000833

e-mail: vkempannasheepbreed@rediffmail.com)

### Profile

Age	: 56 years
Education	: Primary
Landholding	: 12 acres
Farming experience	: 40 years
Crops grown	: Fodder Sorgham
Livestock	: Live stock

### Recognition

Received Krishi Pandith award (2007) from Government of Karnataka, Innovative farmer award (2008) from IARI, New Delhi and Sri. Jagajeevan Ram Puraskar (2008) from ICAR, New Delhi.

Invitee of Dr. M.S. Swaminathan Commission for framing National Agriculture policy.

Member of Extension Education council of KVAFSU, Bidar

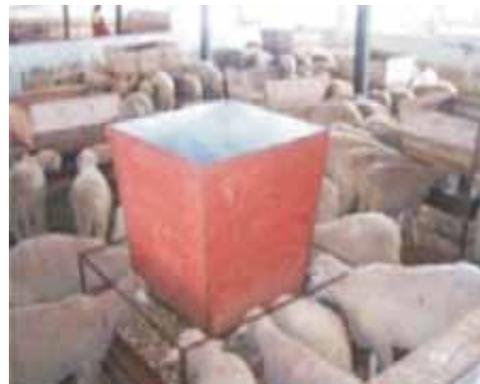
Received first prize in Southern Regional Livestock Show (1985) held at Tirupathi, Andhra Pradesh, Indian cattle show (1996) held at Bangalore, Best Breeder award in All India Cattle Show (1998) held at Hyderabad, Nandi Uthsava (1999), Chikkaballapur, first and second prizes for best wool type sheep breeds in All India Livestock Show (2001) held at Bangalore and participated in many more exhibitions and delivered lectures. He was one of the 101 farmers in Harvest of Hope book and 10 in success stories published by Krishi Mantralaya, Govt. of India during 2010.

### Description of innovation

Maintaining pure breed stock by cross breeding of exotic breeds with local breeds since 1976. Presently he is having sheep breeds like Rambullet, Southdown, Bharath, Merino Dorper, Bannur and goat breeds like Shirohi, Barbari, Jamunapari.

### Practical utility of innovation

Shri Veera Kempanna's technique of cross breeding of exotic rams with local flock reduced mortality rate of the flock, increased average adult weight of sheep go up to 45-50 kg in ewes and 60-70 kg for ram and better quality of meat as well as wool quality with longer staple length.



Sheep herd maintained by Shri Veerakempanna



# Village Level Fodder Bank

**Shri Madhava Reddy Karakampalli**

Village Gundlakattamanchi, Post K.G.Satram, Mandal Bangarupalem

District Chittoor, Andhra Pradesh

(Mobile : 09866090081)

## Profile

Age	: 50 years
Education	: 9 std
Landholding	: 1 ha
Farming experience	: 40 years
Crops grown	: Groundnut, sugarcane, paddy, sunflower, vegetables, coconut and fodder crops
Livestock	: Cows (2)

## Recognition

Recipient of Progressive Farmer Award from IARI, New Delhi, Best Farmer Award by State Farmers Federation, Best farmer award by Village Milk Society, Certificate from Prasar Bharati, New Delhi for Kisan vani programme, Certificate of Merit from the District Collector for fodder production.

Member of Planning Board, Sri. Veterinary University, Tirupati and REAC, ANGRAU, Hyderabad.

## Description of innovation

In 2 acres of his land Shri K.Madhava Reddy is raising 85 fodder varieties i.e Guinea, Napier and tree species. He collected all the species from A.P, Karnataka, Tamil Nadu and Kerala states. For the past 12 years he is doing research on all these varieties and identified 40 {Guinea (20 sps), Napier (15 sps) and Tree species (15)} of them most suitable for cultivation considering the prevailing farming situations in Chittoor district. He not only works on cultivation of different species but also tested the palatability and yield improvement in milch animals. Such a farm holding large number of species is not found anywhere in the State and no way inferior to research farm of any University.

## Practical utility of innovation

Shri Madhava Reddy's farm is a source of planting material to farmers, research farms, and other private Dairy farms. With the support of Animal Husbandry Dept and ATMA, Chittoor he supplied seeds and slips to about 10000 families in the district in addition to neighboring districts like Kadapa, East Godavari, West Godavari and Nizamabad. He also motivates the Dairy farmers to take up fodder production through training programmes, radio talks, TV Shows and news items. He is identified as the resource person and farmer facilitator by the State Department of Animal Husbandry. His farm is regularly visited by the farmers, officials and Veterinary students of the University.





# Low Cost Broiler Brooding System

**Shri Ghono Das**

Village Napatia, P.O Chongkham, District Lohit, Arunachal Pradesh

## Profile

Age	: 54 years
Education	: 12 std
Landholding	: 7 ha
Farming experience	: 30 years
Crops grown	: Paddy, mustard, maize, vegetables and potato
Livestock	: Cows, poultry and goat

## Description of innovation

Low cost brooding system of broiler was made by Shri Ghono Das, with locally available materials like bamboo material, which is cheaper compared to the brooders available in the general market. This practice could be used easily with a very minimal cost, maintained very effectively and required only little skill. This structure could be used 3 to 4 years without any recurring expenditure. It is also very much eco-friendly.

## Practical utility of innovation

This practice of brooding system could be used widely among the farming communities with a little investment and semi skill persons having expertise in working with bamboo materials can be engaged locally. Poultry growers can easily adopt for better management of their farm.



Broiler brooding unit



# Modified House for Rabbit Rearing

**Shri Arbit Marak**

Village Morokgre, P.O Gambegre, District West Garo Hills

## Profile

Age	: 45 years
Education	: 10 std
Landholding	: 2 bigha
Farming experience	: 25 years
Crops grown	: Banana, arecanut and vegetables
Livestock	: Rabbitery, piggery and poultry

## Description of innovation

This low cost bamboo house with thatch roofing and bamboo cage for rearing of rabbits is made from locally available materials. The structure remains at least for 3 to 4 years and could be utilized for rearing the rabbits in a scientific manner. The modified system of rabbit rearing saved labour and time with more profitability as compared to recommended method of rearing house and cage of rabbit. This modified system is popular, economical and adaptable across the small and marginal farmers of the locality in the district of West Garo Hills.

## Practical utility of innovation

As the construction of Scientific rabbit rearing house is more and not affordable by small and marginal farmers, this low cost rabbit rearing house in cage is more affordable which saves labour and time as well as gives more profit. The net return per rupee investment was recorded with 3.59 in the cage and 3.51 in the house. The farmer's innovation of low cost rabbit rearing house and cage saved about 13.5 % labour and 55% time.



Rabbit rearing unit



# White Light for Cost Effective Poultry Farming

**Shri Ravindra Singh**

Village Narayanpur, P.O Choteganj, Block Sangipur  
Sub Division Lalganj, District Pratapgarh, Uttar Pradesh (Mobile: 09453901626)

## Profile

Age	: 40 years
Education	: Graduate
Landholding	: 4.25 ha
Farming experience	: 15 years
Crops grown	: Paddy, wheat, onion, potato and cucurbits
Farming system	: Poultry based farming system
Livestock	: 5000 birds

## Description of innovation

The old recommendation for the light period for poultry production is 16 hrs with high power yellow light, which consume much more energy. The farmer introduced low power white light with low energy consumption and increased production.

Yellow light induced more feeding in birds resulting production of eggs of 44-45 gram whereas white light restricted feeding (3-4 gram/birds) and resulted in production of eggs of 52-53 gram without giving any stress on birds.

## Practical utility of innovation

This technology reduces production cost and white light is easily maintained by battery. Feed cost is also reduced. Laying period is extended to 330-340 eggs instead of 320 egg.



Poultry farm with white light



## Bamboo Trap for Fish and Crab

**Shri Lalramliana Daldawk**

Mamit District, Mizoram

c/o : Vaia Hardware Store, Lengpui, Mizoram

### Profile

Age	: 38 years
Education	: 8 std.
Landholding	: 2 ha (contract farmer)
Farming experience	: 24 years
Crops grown	: Rice, maize, sunflower, cabbage, cauliflower, chilli, carrot, radish, and coriander
Livestock	: Dairy and poultry

### Description of innovation

Trap for harvesting fish and crab is made of split bamboo in such a manner that fish or crabs are allowed to enter inside it but they can't find the way out due to torrential water current. It is locally known as *bawng or ngawi*.

### Practical utility of innovation

The main problem fish farmers are facing in this region are catching fish from torrential rocky streams. For this reason they developed such trap from bamboo and it helps in catching fish and crabs. It is profitable and can easily be made from bamboo. C:B ratio is 1:1.7 (including labour cost). Useful for small hilly farms. Crabs can also be caught which is a delicacy in hilly regions.



Bamboo trap



## Eco-Friendly Fishing

**Shri Nyato Riba**

Village Regi, P.O Basar, District West Siang, Arunachal Pradesh

(Mobile : 09402893925)

### Profile

Age	: 61 years
Education	: 10 std
Landholding	: 23 ha
Farming experience	: 50 years
Crops grown	: Rice, black gram, green gram, maize, mustard, pea, potato, french bean and cow pea
Livestock	: Cows and poultry

### Description of innovation

The Galo, a major tribe of Arunachal Pradesh are experts in fishing in many ways. The technique is eco-friendly in nature and designed and developed using locally available materials. Common fishing tool used by Galos is *Edir* (well Designed basket with a valve) used after draining the river to catch running fish. *Edir* is a skillfully designed fishing trap in the form of basket. It is conical in shape. After entering a fish cannot come out. This trap is commonly used during the lean season or drying of the river.

### Practical utility of innovation

It is very easy to handle by male, female and children and can also be used by individual or collectively as per desire. Also this method is completely harmless to aquatic life. The basket put into the river/streams blocks the other points so that the fishes will not escape. Rural people have also been using this for earning money and it also gives the opportunity to the unemployed youths to earn something for living a respectable life.



Fishing device



# Cost-effective Fish Seed Packing and Transport

**Shri Hasan Mhaslai**

At Gove, Post Pugaon, Taluq Roha, District Raigad, Maharashtra  
(Mobile : 09421252939, e-mail id : hasnmhaslai @ yahoo.com)

## Profile

Age	: 36 years
Education	: 11 std
Landholding	: 4ha
Farming experience	: 6 yrs
Crops grown	: Catla, rohu, mrugal, silvercarp, grass carp, common carp and <i>Macrobrachium rosenbergii</i>
Livestock	: Back yard poultry and buffalos (2)

## Recognition

Chairman of Kundalika Macchimar Sahakari society, Gove

## Description of innovation

The new fish seed (fry and fingerlings) packing and transportation technique made by Mr. Hasan Mhaslai is from easily available polyethylene bags for packing of fish seed. These bags are of 300 to 350 GSM, 50" to 24" size with water capacity of 50 liters. In these bags 20 liters of water is filled and 5000 numbers of fry (20 to 25 mm) and remaining 2/3 portion of bag is filled with oxygen. Further these bags are sealed with locally and easily available Nylon cables/ ties of 250 x 4.8 mm size. instead of Jute rope and ribbon band.

## Practical utility of innovation

The size /capacity of polythene bag is increased due to which the number/ quantity of seed is increased which ultimately reduces the number of polythene bags and due to which over crowding of bags during transportation is reduced. Apart from this the amount of time required for packing and packing charges are reduced. The use of readymade ties or nylon cables for tying the polythene bags reduced the leakage of oxygen and increased the survival rate of fish seed during transportation. Cost reduction, profitability and drudgery reduction are the relative advantages of this technology i.e. this is very economical from farmers point of view and can be easily adopted by the farmers engaged in fish breeding and nursery rearing and fish seed trading.



Fish seed production unit



# Glass Jar Hatchery

**Shri Sunil Das**

Village Srichandrapur, P.O Sattore, P.S Panrui, District Birbhum, West bengal  
(Mobile : 09679885667)

## Profile

Age	: 32 years
Education	: Matriculation
Landholding	: 1.6 ha
Farming experience	: 6 years
Crops grown	: Paddy, elephant foot yam and vegetables
Livestock	: Poultry and duckery

## Description of innovation

The materials used in this method are transparent mineral water bottle (1 litre), inlet and outlet pipes of polythene, main supply pipe with outlet and overhead tank of 250 litre. A breeding 'hapa' is set up in a pond. Gravid female (2 nos.) and ripe males (4 nos.) of *Cyprinus carpio* are kept in the cloth 'hapa' overnight with floating aquatic weeds. Sticky fertilized eggs are collected from 'hapa' and placed in the glass jar hatchery. Water is circulated through the hatchery continuously for 12 hours from the overhead tank. After 14-16 hours the young hatchlings are automatically collected through the upper outlet of the hatchery and kept in a cement cistern.

## Practical utility of innovation

*Cyprinus carpio*, a good breeder fish species releases its eggs into pond water, which are destroyed by other fishes. Fish farmers do not get adequate spawn of this fish to produce fingerlings. A simple modification with the help of low cost materials proved to be very successful in hatching of eggs of this species. A modification



Preparation of modified hatching system

of large and costly glass jar hatchery helped the fish farmers to produce fingerlings of *Cyprinus carpio*, an exotic fish locally called as common carp which is preferred over other Indian carps in the district. The system being fully portable and easy to handle, can be practiced in the remote places for hatching. The mortality rate is very low as well as percentage of hatch outs remains very high. The system can be assembled and dissembled very easily to avoid any damage while carrying in the village.



THEMATIC AREA 8

## POST HARVEST TECHNOLOGY AND VALUE ADDITION



# Clayed Bamboo Wall Structure for Reducing Storage Loss of Ginger

**Shri Farncis Mawlong**

Block Umsning, District Ri-Bhoi, P.O Bhoirymbong, Meghalaya

## Profile

Age	: 58 year
Education	: Illiterate
Landholding	: 9.3 acres
Farming experience	: 50 years
Crops grown	: Paddy, ginger, turmeric, french bean, sweet potato, tomato, chilli, maize, ground nut and soyabean
Livestock	: Pig and poultry

## Description of innovation

Two chambers of 2 x 2 m<sup>2</sup> size and 1.4 m height are developed with bamboo mat. The chambers are actually double wall structure, each wall is separated by 20 cm. The inter-space between the two walls are filled with slurry of cow-dung and clay up to a height of 1.4 m. The outer side of the walls are plastered with cow dung and clay paste and allowed to dry completely. The whole structure may be made indoors or outside depending upon the availability of space. If made outside then the structure is covered with thatch. Ginger rhizomes are stored in a chamber with alternate layers of dry sand and rhizomes keeping the thickness ratio of 2.5 (dry sand):10 (rhizome) cm. The lower and upper layer sand was kept around 8 cm thick. The top of the chamber was covered with the polythene sheet and sealed from edges by putting more pressure with the help of spilt bamboo. It was recorded that there were loss of weight of rhizome (5-6%), sprouting (5%) and rotting (8-9%). The capacity of the storage in such a structure was approximately 4 tonnes of rhizomes with 350 kg to 400 kg per cubic meter of space.

## Practical utility of innovation

The minimum 30% loss incurred by pit storage was minimised by this new method. The rhizome rate at the time of sowing season varies from Rs. 20 to 40 per Kg. the unit cost of storage came to Rs. 0.50 per Kg. With slight modifications, the structure was used up to 5 years.



Clayed bamboo wall structure for storing ginger



Alternate layers of ginger and sand



# Storage of Tomatoes through Air Hanging Stalkes

**Mrs Sephali Debnath**

Village Samrucherra, P.O Chebri, Khowai, District West Tripura, Tripura

(Mobile : 09863732251)

## Profile

Age	: 38 years
Education	: 7 std
Landholding	: 9 Kani
Farming experience	: 15 years
Crops grown	: Tomato, ground nut, rice, long bean, potato, brinjal and papaya
Livestock	: Cows

## Recognition

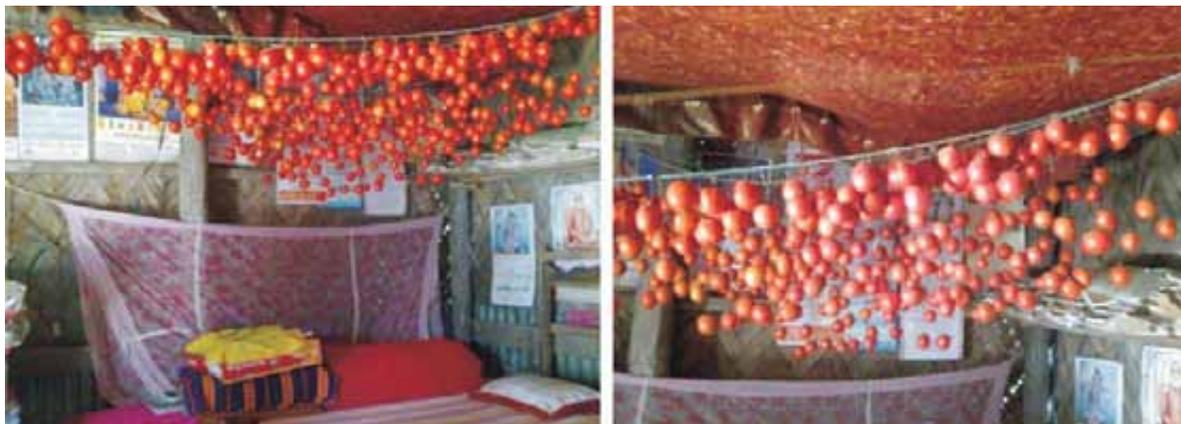
Cashier of Sanhita Self Help Group

## Description of innovation

Domestic storage technique of matured tomatoes at harvesting stage. The technique involve is air hanging of stalked tomatoes on ceiling by tying with thread. Ropes with 1-2 cm diameter are tied on two side of bamboo pool. On the rope, tomatoes are tied with stalks is hanged keeping at least 6 feet. Height from the ground level and 2 feet below the roof with free air circulation. To protect direct light from the roof they kept ceiling of thick cotton cloth at a distance of 1.5 feet from the roof. This increases the shelf life of tomato upto 3- 4 months.

## Practical utility of innovation

This method involved less labour as well as time. Expenditure was only for thread and labour. Cost Benefit Ratio ranges was 1:30. Even though it is a new innovative approach, the adoption percentage is about 45%. The popularity is gaining very fast among the tomato growers of the West district of Tripura



Air staking of tomatoes



# Home Made Aloe-Vera Soap

**Smt Alemla**

Village & P.O Naga United, 4<sup>th</sup> Mile, Dimapur, Nagaland

(Mobile : 09436013537)

## Profile

Age	: 43 years
Education	: Graduate
Landholding	: 2 ha
Farming experience	: 7 years
Crops grown	: Aloe vera, cabbage, tomato and pea
Livestock	: Pigs, cows and poultry

## Recognition

President of SHG fed. Medziphema, Dimapur.

Project Director of Nagaland Mercy Mission

## Description of innovation

Major ingredients used by the farmer for home made aloe-vera soap are Aloe-vera gel 5 litres., crude oil- 5 litres, Lemon- 5 numbers, Neem leaves-500 gms and washing soda-1 kg. Aloe-vera gel is extracted, filtered and kept in plastic container 1 kg of soda is added to it. The whole material was stirred uni-directionally for 30 min. Added lemon juice and neem leaf juice (1 cup) and continuously stirred in the same direction. Then refined oil was added and continuously stirred for another 30-35 min. When it gets slightly solidified then it was poured in a wooden container lined with polythene and it is kept for 6 hours. After this it is cut into desired shape and size and stored for two weeks and sold in the market as Aloe-vera soap. Nearly 110 pieces of soap are prepared by using the above quantity of ingredients.

## Practical utility of innovation

Locally available aloe-vera grown widely in the region could be used effectively for making the soaps by the trained people. Aloe-vera soap is having adaptability to the existing local condition as other soaps are sold at higher prices. As the soap is cheaper, villagers are also able to purchase it. The total cost of preparation of 1 piece of soap is Rs. 7.50 and sold in market at Rs. 10/- with a net benefit of Rs. 2.50 per piece.



Home-scale soap making unit



# Fermented Bamboo Shoots for Culinary Uses

**Smt Teilang Rani**

Umden Arka, Ri-bhoi, Meghalaya  
(Mobile : 9856716401)

## Profile

Age	: 36 years
Education	: Graduate
Landholding	: 2.8 ha
Farming experience	: 12 years
Crops grown	: Paddy, ginger, french bean, sweet potato, carrot, chilli, and maize
Livestock	: Pig and poultry

## Recognition

Leader of Women Group

## Description of innovation

Preservation of bamboo shoots in water for ready consumption. Stunted shoots which are not likely to produce bamboo shoots of good quality are used. Tender bamboo shoots of 45-60 cms long are selected. After removing the sheaths or outer covering leaves, they are cut into thin slices and put in water in large jars. After three or four days it starts fermenting and gives out a strong smell. The bamboo shoots are now ready to be used for making curries, soup, pickles, chutneys, etc.

## Practical utility of innovation

Unavailability of bamboo shoot throughout the year is a major problem. As it is widely used in the traditional Khasi cuisine this fermentation practice serves as a ready store of bamboo shoots throughout the year. Fermented bamboo shoot is a favorite delicacy among the Khasis and widely used for preparing various traditional dishes in their food habits.



Fermented bamboo shoot



# Jim Tenga - Ready to Consume Fermented Bamboo Shoots

**Smt Jahnobi Roy**

Babupara, Dudhnoi, Goalpara, Asom

(Mobile:09864709529)

## Profile

Age	: 45 years
Education	: M.A., B.Ed
Landholding	: 0.1 ha
Farming experience	: Currently not active
Livestock	: Duckery, poultry and pigeon

## Recognition

Highly respected School teacher actively involved in all social activities.

## Description of innovation

Fermented process developed by Smt Jahnobi involves sliced bamboo shoots are filled into glass bottle. Then added water till bamboo shoots submerged. Bottle was closed tightly with the cap and kept in the corner of a room or above the cooking place of the house for fermentation. In this method, shoots were preserved up to 1 year. Bamboo shoots were consumed as such or eaten with meat or fish or as pickle. This process of fermentation enhances the nutritional quality by increasing amounts of vitamins and protein solubility and by improving amino acid pattern.

## Practical utility of innovation

In the NE Region, where Protein Energy Malnutrition is a major problem, fermented bamboo shoots have a great potential as an important protein source. The cost involvement was Rs 15 and sold at Rs 60 per bottle. Nutritive value of fermented Bamboo shoot is dry matter 8.9g%, protein 8.5 g%, fat 0.6 g%, fibre 11.1 g% and ash 14.8 g%.



Jim tenga



# Murugesan's Banana Fiber Spinning Device

**Shri P. M. Murugesen**

3/43 Main road, Village Mellakkal, Taluq Thirumangalam  
District Madurai, Tamil Nadu (Mobile : 09360597884)

## Profile

Age	: 43 years
Education	: 8 <sup>th</sup> class
Landholding	: 3 acres
Farming experience	: 30 years
Crops grown	: Banana, paddy and vegetables
Livestock	: Two cows

## Recognition

Received Micro Entrepreneur awards – National winner 2010 South as a model of individual entrepreneurship.

Member in Sustainable Agriculture Environmental Voluntary Action (SEVA) and farmer discussion group convener

## Description of innovation

Developed hand operated banana fiber spinning device for banana fiber rope production. It consists of bicycle wheel with hook in which banana fiber is threaded into rope for making baskets, plate, handicrafts etc.

## Practical utility of innovation

Hand operated banana fiber spinning device is cost effective. Innovation helps in converting banana pseudo-stem into useful products which could generate additional income as well as employment for rural people. Shri Murugesen established a cottage industry with 2 units wherein employed 40 labourers and produced 15,000 meter banana fiber rope per day. Further, established a unit at Kallipatti Village on production of banana fiber handicrafts like baskets, mat, and water bottle basket and earns a net income of Rs 60,000/year. This simple innovation creates year-round rural employment for 40 villagers.



Banana fiber rope making using Murugesan's banana fiber spinning machine

Banana fiber handicrafts enterprise



# Low Cost Vermicompost Bed Preparation

**Shri Sirajuddin**

Village Biswastolly, P.O Chargoria, Chopra,  
District Uttar Dinajpur, West Bengal (Mobile : 9933504279)

## Profile

Age	: 52 years
Education	: 10 std
Landholding	: 1 ha
Farming experience	: 30 years
Cropping Pattern	: Paddy, pulses vegetable and oilseeds
Livestock	: Poultry and goatary

## Recognition

Member of Farmers Groups

## Description of innovation

Generally for preparation of vermicompost, concrete structure is advised which is costly and may not be feasible for the poor farmers to practice. Shri Sirajuddin made vermicompost pit of 4'x 2'x 2' which was erected using locally available materials like clay soil, cowdung, paddy straw, bamboo pegs and empty fertilizer bag (plastic made). Initially the specified structure was erected using clay soil. The outer and inner wall of the whole pit including the pit bed was coated with clay and cow dung and left for one or two days under the sun for drying and to make the structure hardened. The bed of the pit including the inner sidewalls covered with plastic bag (usually empty plastic fertilizer bag). An even layer of 4 inches paddy straw was used as base material. Bamboo pegs are used at four corners of the pit to keep the plastic erect to prevent the attack of red ants and mice.

## Practical utility of innovation

Use of locally available resources not only reduces the cost of bed preparation but also keeps inner temperature low, maintains optimum moisture level and make it is easy to maintain. As per the farmer the cost is reduced to one-tenth than the concrete structure. This method provided an appropriate solution for the aspiring farmers of the district to produce vermicompost in every household.



Soil made pit



Putting Vermicompost in the pit



Covering pit by polythene



# Different Way of Storing Vermicompost

**Smt Ruma Basak**

Village Sadhuramgacch, P.O Chopra, District Uttar Dinajpur, West Bengal

(Mobile : 09932350450)

## Profile

Age	: 37 years
Education	: 7 std
Landholding	: 0.4 ha
Farming experience	: 5 years
Cropping Pattern	: Paddy and vegetable
Livestock	: Backyard poultry

## Recognition

Member of SHG

## Description of innovation

In this developed technique, ready vermicompost was sieved thoroughly and kept in plastic bags tied loosely for a period of 4-5 days for allowing to the cocoons already present in the sieved compost to hatch in the same compost bags. On the sixth day this ready compost is again sieved thoroughly to separate compost and worms. The separated worms are again put in composting pit to maintain the stock and the compost was sold. It was highly effective in avoiding the reduction in worm stock, wastage of cocoons in compost itself is avoided and the entire process requires very little time and energy.

## Practical utility of innovation

Households where vermicompost is produced and sold at a small scale often face the problem of depletion of stock of worm to regenerate the process. Worms being difficult to transport from other places during the need, prevented the farmers from producing vermicompost. The innovative way of maintaining stock can easily be done by the women without drudgery and additional cost.



Sieving and storing of Vermicompost



## Marigold Oil – Mine for Money

**Shri Samar Singh Bhadauriya**

Village & Post Sawaijpur, Block Sarsaul, District. Kanpur Nagar, Uttar Pradesh

(Mobile: 09919285982)

### Profile

Age	: 64 years
Education	: High school
Landholding	: 1 ha
Farming experience	: 20 years
Crop grown	: Mustard, marigold, lemon grass, farma rosa and sinkonela

### Recognition

Member of Chandra Shekhar Krishak Samiti, Kanpur

### Description of innovation

Once Shri Bhadauriya plucked the marigold flowers and processed the whole plant of marigold for oil extraction during November month. He obtained 600 gm oil out of 10 q plant of marigold. Then he consulted experts for verifying the extracted oil for its purity. After examination, the oil was found pure, he established two processing units of one tonne capacity. During the first season, he extracted 25 kg oil and further he observed the oil from the marigold plant @ 50 kg per year with additional yield of flowers. The oil is being sold @ Rs 2500 per kg. He is earning net profit of Rs 1.25 lakh per year from the extracted oil and additional gain of flowers worth Rs 2 lakh from 1 ha area.

### Practical utility of innovation

By this process, after plucking the flowers the marigold plant is processed for the oil extraction. The remaining processed material was utilized for *Havan Samagri*, mushroom production, organic manures and mulching material to the other crops for eco-friendly environment.



Marigold oil extraction unit



Marigold crop



Deputy Director General  
(Agril. Extn.)  
Agricultural Extension Division  
Indian Council of Agricultural Research

## Epilogue

INDIAN farmers are profiled as smallholders, resource poor, toiling at remote, complex and diverse, and remote environment. But more important is to recognize them as 'innovators' of farm technologies in parallel with agricultural researchers.

In this context, this publication is the compendium, of significant farm innovations which have been generated as well as reinvented by a few farmers who have blended their vast experience and wisdom about farming situations as well as scientific basis for translating into innovations. These innovations are like precious portraits painted by farmers by their creativity, hard work and sincerity and zeal to bring in novel solutions to their micro level situations and thus, are playing a vital role in accelerating innovation-led agricultural growth.

These farmers are torch bearers of revolutionizing Indian Agricultural and therefore, need to be identified and encouraged. More importantly, their innovations are to be documented, validated and then coupled with modern technologies generated by agricultural scientists for upscaling among farming community by involving these grassroot innovators as effective change managers in agriculture.

This kind of aggregation, processing, documenting of farm innovations and sharing among wider audience in the form of "Farm Innovators 2010" is a beginning by the Council. All those involved i.e. farmers, KVK, Zonal and at National level in bringing to this form deserves appreciation.

We look towards synergetic partnership between Innovator farmers and Agricultural Scientists as well as amalgamation of their innovations for working towards futuristic agriculture. Henceforth, this efforts of showcasing farm innovations and grassroot innovators in the form of document would continue in the years to come.

(K.D. Kokate)

18 October, 2010  
New Delhi

रातें कितनी ढल चुकी,  
सितारों से पूछो ।  
लहरें कितनी मिट चुकीं,  
किनारों से पूछो ।  
पानी कितना बह चुका,  
नदियों से पूछो ।  
टेक्नोलॉजी क्या-क्या निकल चुकी,  
KVK से पूछो ।

