

Farm Innovators

Take the Challenge, Be the Change



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ICAR - Agricultural Technology Application Research Institute (ATARI)

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Dr A.K. Singh

Deputy Director General (Agricultural Extension)



FOREWORD

The Indian Council of Agricultural Research (ICAR) through its Agricultural Extension Division is steering the frontline extension efforts in agriculture across the country at district level through Krishi Vigyan Kendras (KVKs) which are coordinated at the regional level by Agricultural Technology Application Research Institutes (ATARIs). The mission of the KVK scheme is farmer-centric growth in agriculture and allied sectors through application of appropriate technologies in specific agro-ecosystem perspective.

The frontline extension system of ICAR is geared up for effective outreach to farmers. ICAR is implementing several innovative initiatives with a farmer-centric participatory approach. In the process of technology transfer, KVK scientists observe a number of farmer-led innovations. Several promising ones are supported under the Farm Innovation Fund linking the farmer, KVK and research scientists for their scientific validation.

My complements to ATARI, KVK scientists and farmers in Zone-X for documenting the efforts of farmers in the states of Andhra Pradesh, Telangana, Tamil Nadu and Puducherry. I am sure that this publication will help in bringing recognition to the farmer innovators and motivate all stakeholders for making farming profitable and sustainable.

Date: 9.04.2018

(A.K. Singh)

PREFACE

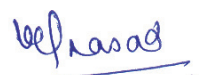
'Be the change you wish to see in this World' – Mahatma Gandhi

While research efforts are predominantly linear in orientation, the approach to address multi-faceted problems of farmers is often non-linear. Due to constraints of time and resources to test and develop technologies in diverse environments, research recommendations are sometimes generic in nature. Chances of faster acceptance and adoption of practices and technologies emanating from multi-location adaptive research are higher. But this is not the case with all technologies that are developed. Further, adaptive research is required as agriculture is predominantly location and context-specific.

As practitioners, farmers deal with various problems faced in their micro agro-ecological settings on their farms. They find it necessary to dovetail recommended technologies and practices to suit to their resources and farming situations. Also, farmers require an assemblage of technologies that have both forward and backward linkages. In the process, farmers either due to necessity or learning through exposure, tend to come out with newer ideas and innovate in their own way. Many times, we come across farmers who think 'out of box' and practice agriculture differently and unconventionally. There is a need to identify such farmer-led innovations and understand the context in which they are applied. And their scientific validation in participatory mode makes it possible to communicate and mainstream them in ongoing schemes for wider adoption.

This document collates the efforts of farmer innovators in the thematic areas of farm mechanization (13), horticulture (5), organic farming (6), integrated farming systems and allied enterprises (8), processing and value addition (4). A total of 36 profiles of innovators are presented by 26 KVKs across Andhra Pradesh, Telangana, Tamil Nadu and Puducherry. Each story throws light on their simple yet useful ideas and innovative practices implemented. We hope this compilation that showcases the efforts of these 'change agents' is useful and inspires others to move forward in this direction - Take the Challenge, Be the Change.

Date: 9.04.2018



(Y.G. Prasad)

Director

Contents

Mulching made easy – tool for punching grow out holes	1
Durable drum seeder for direct sown rice	3
Groundnut pod stripper – a boon for small holder farmers	5
Leverage efficient weeding – long handle lever weeder	7
Pressure tactics – silage making made easy	9
Intelligent Alarm system for Elephantine problem	11
Low cost hatchery makes desi chick rearing a profitable venture	13
Technology in a capsule – a contingency measure for direct sown paddy	15
Cocoon harvester - a silky maneuver	17
Prune to flourish – pruning tool for Jasmine	19
Dispensing fertilizers made easy	21
Planter cum Herbicide applicator	23
Sprayer on wheels – improves efficacy of crop protection	25
Mango craft – grafts on a single tree to produce multiple varieties	27
Go Green – organic vegetable cultivation	29
Multiple cropping system in Mango	31
Mixed farming of vegetables	33
Top Work– grafting on mango trees	35
Panchagavya – a health potion for poultry	37
Liquid Gold - enhances profitability of floriculture	39
Enriched vermicompost – farmer entrepreneur	41
Readymade organics – enriched manure bricks	43
Crop booster - Jeevamritham	45
“Sweet nothings” – chemical free Jaggery	47
Enterprise combo – grain, fruit, milk, eggs and meat	49
An exemplary catch – pond based IFS model	51
Suitable fodder species in rainfed red soil areas	53
Diversification – key for income stability	55
Scientific Pig farming - a pioneer takes the challenge	57
Goat farming- elevated to hygienic level	59
Participatory technology development – feed formulation for dairy	61
Cover the Soil for Resource Conservation	63
Peel and prosper – processed onion boosts returns to farmers	65
Waste to Wealth – organic shampoo from Banana peduncle	67
Ready to eat, ready to cook – millet value addition	69
Chips maker - value addition in Cassava	71

Mulching made easy – tool for punching grow out holes



Name: R. Murugesan
Age: 47 years
Education: Primary School
Land holding: 2.0 acres
Address: Poonaiyanur
Venkatasamudram Post
Pappireddipatti Tk.
Dharmapuri district,
Tamil Nadu – 636905
Mobile: +91 8124267381

Background

Plastic mulching is widely practiced for cultivation of melons (watermelon & muskmelon) during *rabi* season in Dharmapuri district (in >90% of melon area). Three crops (water melon – musk melon – water melon) are cultivated over a short period of 5 months starting in December. Similarly, 20% area under tuberose is under plastic mulching. Use in brinjal and tomato is picking up.

Rationale

Plastic mulching is mainly used for reducing weed management cost and for saving irrigation water. Quality of fruits is also improved as disease incidence is reduced. Plastic mulch of 30 to 40-micron thickness and 4 feet width is commonly used. After spreading the plastic mulching sheet in strips across the field, holes are made using 6 cm diameter MS pipe welded to a one-meter long MS rod handle of 8 mm thickness. The hole maker pipe is kept hot by placing in hot charcoal placed in a bucket, which is carried along during the operation. Two such hole makers are constantly kept hot and used alternately to punch holes in the sheet at desired spacing. Farmer has to use



both hands (bucket and tool) to operate the existing tool, which is tedious and also time consuming. To overcome this problem, Shri Murgesan designed the hole maker based on the iron box principle with hot charcoal placed inside for heating.

Utility

The problem is of plenty holes to be punched. In melons, about 11000 holes and in Tuberose 50000 holes per hectare are to be punched which makes the job tedious and laborious. Shri Murugesan's simple tool frees one hand and reduces the drudgery involved in making the holes in the plastic mulching sheet and increases efficiency.

- The cost involved for making holes in the plastic mulch is reduced by 50 percent by this innovation.
- In terms of labour, the cost involved for labour is reduced by 50 percent. In terms of fuel, the requirement reduced by 80 percent.



Details	Existing method	Farmer's Innovative Hole maker
Time taken per hectare	9.5 hours	5 hours
Labour required per hectare	2 no.	1 no.
Drudgery reduction (%)	-	60.0
Fuel requirement for heating (Fire wood - kg/ha)	10.0	2.0
Cost involved per hectare	Rs. 600/-	Rs. 300/-

Outcome

The tool was tested at the KVK, Dharmapuri farm and was found to reduce drudgery and improve labour efficiency. The tool was demonstrated in farmers field school and exhibitions organized by KVK/ ATMA. About 40% of farmers practicing resource conservation technology of plastic mulching in melons are now using this tool by making their own hole maker, as it can be easily replicated.



Durable drum seeder for direct sown rice



Name: E. Gowri Shangar

Age: 27 years

Education: Graduation

Land holding: 5.0 acres

Address: Kallar street,
Main road, Manapparavai,
Melapalaiyur Post, Kudavasal
Taluk, Thiruvarur, Tamil Nadu

Mobile: +91 9698578588

Background

Direct sown rice cultivation is recommended in areas where late release of canal water is a frequent phenomenon. The farmers go for direct sown rice due to uncertainty in onset and initial spell of monsoon rainfall. Drum seeder technology for direct sown rice has been released by Tamil Nadu Agricultural University and performs well in fields free from undulations. However, use of power weeder is not possible due to 20 cm row to row spacing with TNAU drum seeder. Modification is required for adaptation to local farming situation.

Rationale

Modified drum seeder is made with six splits of silver vessels welded into three drums with perforations spaced at 22.5 cm. The drum can be easily filled with seed and closed. The three drums are connected through a rod which is supported on bicycle wheels at the two ends for easy mobility. The modified drum seeder suits well to the Kudavasal block of Thiruvarur district since most of the farmers take up direct sowing of rice on the next day after receipt of canal water.



Utility

Farmers prepare land under dry condition and keep it ready for irrigation with release of canal water. Next day, paddy sowing is taken up to ensure good germination and plant stand before the next irrigation. The existing drum seeder is not suitable for optimum performance due to undulations in the unpuddled field. The modified drum seeder provides for square planting with a wider spacing to accommodate power weeder operation. Modified wheels



give good mobility in clay soil and also polythene sheet covering prevents blockage of holes in the adjacent drums. The seeder is made up of german silver and is more durable compared to plastic drums. The modified drum seeder developed by Shri Elangesh overcomes several limitations in direct sown rice in using the existing drum seeder and is well adapted to the local farming situation.

Cost of Elangesh drum seeder: Rs. 2800.

Outcome

The modified drum seeder developed by Shri Elangesh overcomes several limitations in direct sown rice in using the existing drum seeder and is well adapted to the local farming situation. The farmer was recognized by Directorate of Rice Research for the innovation and supported by KVK, Thiruvarur.



Groundnut pod stripper – a boon for small holder farmers



Name: M. Mohanasundaram

Age: 60 years

Education: SSC

Land holding: 1.5 acres

Address: Perundurair Main Road, Mariamman Temple Behind, Nasianur, Erode District

Background

Groundnut is cultivated in 17000 ha in Erode district. Acute labour shortage during harvesting period leads to delay in stripping of pods and their marketing. Shri M. Mohanasundaram developed a modified pod stripper for groundnut.

Rationale

Portable groundnut pod stripper is useful for small and medium farmers who face acute labour shortage for manual stripping of pods. The pod stripper is run with a help of 0.2 HP electric motor. The cylindrical type machine is



closed on all the sides and three openings are provided viz., feeding channel, pod collection delivery point and one for dust removal or blowing point. The machine is designed in such a way that two men can work simultaneously.

Utility

By using this machine, a farmer can strip groundnut harvested from one-acre area in two to three days by engaging family labour. Stripping efficiency is high with 99% stripping of pods and easy separation of broken pods. Winnowing operation at the time of stripping is made possible with the support of blower attachment in this machine. It also reduces the drudgery of the women labour and it is easily transported on a bicycle. The cost of the pod stripper machine is Rs.24,000 and can be engaged on hire basis by small farmers.



Outcome

The machine is portable in nature and there is demand from farmers. KVK, Erode tested the performance of the pod stripper. The machine caught the attention of Farmer Producer Organizations (FPOs) to provide their FIGs (Farmer Interest Groups) in groundnut. Some of the KVKs also verified and procured the machine for demonstration to groundnut farmers in their respective areas.



Leverage efficient weeding – long handle lever weeder



Name: S. Duraiswamy

Age: 63 years

Education: Graduation

Land holding: 18 acres

Address: Kumaramangalam
Mettumarudur post, Kulithalai
Taluk, Karur District
Tamil Nadu - 639107

Mobile: +91 9965345400

Background

Weed management is a major problem in rainfed and garden lands. Implements are essential to address shortage, reduce costs and drudgery for women labour engaged in weeding operations. The existing weeders are not user friendly to operate for long hours. Shri Duraiswamy designed a gender friendly implement for weeding in rainfed crops.

Rationale

Balaram weeder is based on the simple lever principle and comprises of steel strips and rod. The inclination of the handle and rod fitted with cutting tool is kept at 30 degrees to enable easy forward movement. Square and round pipes are used to reduce weight of the weeder. Two sets of bush bearings are provided to each wheel so as to smoothen the movement. The distance between the tip of the tool and the rear wheel is reduced by 10 cm. The inclination of the handle and tool increased to 39 degree to obtain good result in garden land weeding. In this model both wheels are set up at the back of the cutter. The cutter is attached at the front for convenient weeding. Now the two sets of wheel play as primary and



secondary pivoting points for the instrument, and also maintain a constant depth for the cutter. The distance between the tip of the cutter and the primary pivoting wheel is reduced to the minimum. The cutting tool is firmly fixed at an appropriate inclination. With to and fro motion on the garden surface, weeds are uprooted up to a depth of 3 to 5 cm. The weeder can be operated by one person and reduces labour requirement compared to 5 labour requirement in the conventional practice of using hand hoe.



Utility

Balaram weeder is manual, portable and easy to transport from one field to another as the weight of the weeder is 2.5 kg and can be easily operated by women labour. Cost of weeding is reduced by about Rs 10000/acre in Tapioca. Cost of weeder is Rs 1700.

Outcome

KVK, Karur tested the long lever hand weeder. Financial assistance of Rs 3.0 lakhs was provided by NABARD under Rural Innovation Fund for development of the weeder. The implement has been displayed in several state level exhibitions at Coimbatore and Trichy. Thiru Duraiswamy



received several recognitions which include: Best Farm Innovator of the state by TNAU, Best Farmer of Karur by Vibrant Gujarat Agribusiness Summit, Gandhinagar in 2013 and the weeder has been recommended for patent by the Trade and Intellectual Property Department. About 500 farmers have adopted this implement so far.

Pressure tactics – silage making made easy



Name: S. Baskar Raja

Age: 54 years

Education: M.A.
(Public Administration)

Address: No.27, Kanniamman
Kovil Street, Thittacherry
Road, T.R.Pattinam, Karaikal,
Puducherry – 606

Mobile: +91 94437 33778

Rationale

The farmer designed a pressing machine which works on hydraulic pressure. The press is in making silage in barrel containers for feeding dairy cows. The machine base is 4' x 4' made up of mild steel frame movable type.

The pressing apparatus is 18' in diameter, works on 7 Kg pressure obtained through hydraulic oil cylinder (piston type) with forward and backward movement facility. The mobility is obtained from 5 HP ordinary gear diesel motor. The pressing apparatus can be used for making silage in PVC barrel of 24' diameter.

Background

Availability of green fodder during the lean season for dairy animals is a serious constraint leading to low milk output. Silage making and storage helps in overcoming this problem to some extent. However, proper preparation is essential to yield good quality silage free from molds. Thiru Baskar Raja came up with an innovative idea to overcome the problem in silage making in barrel containers used by many dairy entrepreneurs in Karaikal district of Pondicherry.



Utility

Fodder scarcity during summer season can be alleviated by preparing and usage of silage in dairies. Hence, this machine helps in preparation of silage in small scale in order to overcome the practical difficulty in conventional silage preparation. Further, 80% of the drudgery and time can be reduced by this technology.



Outcome

KVK, Karaikal, Puducherry provided support the farmer. The production cost of silage by this method is Rs 3.50 / Kg and surplus silage can also be sold @ Rs.6/ Kg to cater to needy farmers. The labour cost is reduced by >50% (from 5 to 2 labour). Several fellow farmers have adopted the technology so far.



Intelligent Alarm system for Elephantine problem



Name: A. Sathiyavel

Age: 29 years

Education: M.E.
(Space Technology)

Address: S/o. M. Chinnathambi
Marichettihalli village
Kaveripattinam block
Krishnagiri Taluk
Krishnagiri District
Tamil Nadu

Background

Krishnagiri district of Tamil Nadu is located between the borders of Karnataka and Andhra Pradesh. It has an area of 5.43 lakh hectares out of which 1.45 lakh hectare is forest area which is home to more than 150 elephants. Frequently the elephants from the forest area enter into adjoining farmers fields and damage crops. The normal practice of prevention of entry and damage is scaring by bursting crackers by forest officials. Thiru Sathiyavel came up with an intelligent system for detection and scaring of elephants from trespassing into agricultural fields and minimize the man-vertebrate conflicts in fringe areas of forests.

Rationale

The automation system is deployed on field borders for repelling elephants by producing a cracking sound from the high sound producing speaker when at the time of crossing into fields. The animals are detected by their digital technique values using laser source with Light Dependent Resistor



(LDR) setup connected with a microcontroller. A speaker is connected to the microcontroller to divert the animals back to the forest by producing high cracking alarm sound. When an Animal is detected by laser, the microcontroller turns ON the Speaker through relay. The whole setup is powered by a solar panel. A battery is used to save the generated charge and charge controller directs the charge from the solar panel to the battery without loss in power. LM117 is charge separator which separates the power equally between the Microcontroller and the Speaker to increase the Efficiency of the system.



Utility

The intelligent system is useful in preventing elephants from entering agricultural land and can avoid conflicts and threat to life of farmers and forest personnel. Crop damage is minimized and livelihoods of farmers in the fringe areas of forests are not affected.

Outcome

The system has been verified by Department of Forestry in Krishnagiri and also the innovation has been scientifically verified to be effective. The cost of the instrument is Rs.12000 and Rs. 36000 if powered by a solar panel. Department of Forestry, Krishnagiri accepted this Elephant Repellency System. The innovation has been given wide publicity through media in affected districts in Tamil Nadu.



Low cost hatchery makes desi chick rearing a profitable venture



Name: R. Suresh

Age: 36 years

Education: BBA

Land holding: 2.5 acres

Address: S/o.Rajagopal

South street, Thathanur

Kudikadu Thathanur Post

Udayarpalayam Taluk

Ariyalur District - 621804

Tamil Nadu

Mobile: +91 8098455485

Background

Backyard poultry has picked up as an income generating activity among youth, women and landless poor. Desi types are generally hatched by brooding hen. However, automation and ability to hatch the desi types in the farm itself puts more money into the farmers pockets as it ensures several cycles and also sale of chicks locally is profitable.

Rationale

To address this gap, Thiru R. Suresh developed a low-cost hatchery with a capacity of loading 120 desi chicken eggs. The unit consists of the following major components: thermocol box (1 no.), welded mesh (2), 12 volt DC fan (2), bulb with holder (1), plastic box for watering (1), 12 volts SMPS unit (1) and thermometer (1). All the components are assembled in a compact thermocol box. The unit is fitted with 40 watts incandescent bulb as energy source. The bulb is covered with aluminium foil cover to generate heat required for the hatching of eggs. Normally 99.9°F (37.5 °C) is generated inside the incubating unit. There is provision to insert thermometer and to check the temperature inside. To maintain the relative humidity required i.e 80%, a provision is made with two plastic trays. In the first plastic tray water is filled and kept inside for the first 18 days of loading eggs. On 19th day,

the second tray is filled with water and kept inside to maintain relative humidity of up to 60 to 70 %. After trial and error coupled with technical support from KVK, Ariyalur, alterations were made to maintain 80% humidity in the unit by providing one more water tray with covered with cotton cloth over a mesh placed in the tray. Hatching is >80%. Eggs are to be rotated manually 3 times in a day at an interval of six hours. The water level in the trays should be maintained by regular filling up of water. Eggs are checked by candling (against a light source) on 5th day to ascertain the status of growing embryo. Failed eggs are removed and consumed.





Name: S. Rajadurai
Age: 26 years
Education: Diploma in Civil Engg.
Land holding: 1 acres
Address: S/o. Saminathan,
South street, Parukkall post
Udayarpalayam Taluk
Ariyalur District – 621 804
Tamil Nadu
Mobile: +91 8526714100

Utility

The hatchery unit innovation developed by Thiru Suresh, enabled an youngster Thiru Rajadurai to set up the unit in backyard poultry rearing unit on commercial scale.

Initially he started a small unit and by experience developed a feed ration formula comprising of maize (40%), rice (10%), sorghum, groundnut

cake (14%), blackgram husk (8%), rice bran (13%), killinjal 3% (clam) and mineral mixture (2%). With demand for chicks, he expanded his poultry unit with 150 parent birds belongs to different varieties. He procured the hatchery unit for 120 eggs capacity from Thiru Suresh. He developed a model of direct marketing of his eggs and chicken meat that is familiar among the residents of Jayankondam area. He supplies 50 desi bird eggs and 2 Kg chicken per @ Rs.1,000 as a package.



Outcome

From January 2016, Thiru Suresh supplied 96 low cost hatchery units to 96 farm families in Ariyalur, Namakkal, Salem, Perambalur, Thanjavur and Cuddalore districts. Technical backstopping and monitoring was provided by Dr. Balasubramanian, Associate Professor and Head, VUTRC, Perambalur. KVK, Ariyalur validated the performance of the hatchery unit and aided in improving the hatching percentage from 64% to 80%. The innovation helped Thiru Rajadurai earn Rs 30000 per month through his backyard poultry unit. His feed formula and ethno-veterinary practices for poultry disease treatment helped him to cut down costs and increase returns. KVK, Ariyalur provided technical backstopping to these two young entrepreneurs and extended around support under the entrepreneurship development programme of KVK.



Technology in a capsule – a contingency measure for direct sown paddy



Name: S. Venkateshwaran

Age: 41 years

Education: BBA, PDCA

Land holding: 1.25 acres

Address: S/o.Th. V. Sundaram
42, Mariamman Kovil Street
Kavalkarapalayam, Sirugamani
639 115, Andanallur block
Srirangam Taluk
Tiruchirappalli District
Tamil Nadu

Mobile: +91 9994443695

Background

Nursery is a vital stage in paddy cultivation which requires significant quantity of water. During drought situations the conditions are very critical. Farmers of Cauvery delta region depend on release of canal water for taking up paddy cultivation. Only after the water release, nursery is raised. Direct seeding is an alternate technology to cope with late sown conditions. Thiru Venkateswaran came up an innovative capsule technology for direct sowing of paddy seeds during drought conditions.

Rationale

Innovative seed capsule method of sowing is an attempt to overcome contingent situations such as drought due to deficit rainfall / late release of water for paddy cultivation. The technique is akin to the modified System of Rice Intensification (SRI) wherein single seedling is transplanted. However, in direct sowing method, paddy seed is encased in a capsule and then sown in the paddy field. In this method seeds can even be sown in dry conditions prior to release of water. On receipt of rain or released water, the capsule is dissolved and seeds germinate. Direct sowing with marker helps maintain 25 cm spacing for adequate plant stand and



Cocoon harvester - a silky maneuver



Name: G. Gurumoorthy Setty

Age: 51 years

Education: SSC

Land holding: 6.0 acres

Mulberry-2.0 acres mother block

Address: S/o: G.Appi Setty Yeduru

Tallapalli, Dandapalli post
Gangavaram Taluk

Chittoor District

Andhra Pradesh

Mobile: +91 9849126223

Background

Chittoor district is popularly known as “the district of silk and milk” due to large scale adoption of sericulture and dairy as income generating enterprises in addition to Agriculture. Mulberry sericulture is practiced in about 39000 acres in the district especially in western part of Chittoor. Production and harvesting of cocoons is labour intensive. Quality cocoons fetch higher prices in the market. Shri Gurumoorthy Setty came up with an idea of a silk ‘cocoon harvester’ to make harvesting, cleaning and bagging of quality cocoons easy, cost-effective and efficient.

Rationale

The normal method of harvesting cocoons at his farm is expensive as it takes about 3-4 days for manual harvesting of cocoons from 100dfls, but it is economically feasible at family level. However, when manual harvesting of cocoons is done from more than 300 to 400 dfls, 4-6 members need to be engaged beside family members. To minimize time and labour requirement, the farmer himself has designed and developed a cocoon harvester for plastic collapsible and rotary mountages.





Utility

Harvesting, cleaning and bagging of cocoons is made easy. The cocoon harvester can harvest, clean and bag 120 netrikas per hour and 700 netrikas in day. Nearly 60% of labour wages can be minimized by using this harvester. Farmers can take their produce to the market on the same day of harvest which fetches good market price to the farmers. Cost of Machine: Rs 30,000.

Outcome

Experts of the farmer was utilized as a resource person by KVK, Chittoor (RASS). At present, 60 farmers are using this machine to harvest cocoons on hire basis and 3 farmers ordered to purchase this machine.



Prune to flourish – pruning tool for Jasmine



Name: R. Ramanjaneya Reddy

Education : M.A

Age: 60 years

Land holding: 20 acres

Address: Peravali

Singanamala Mandal, Anantapur
Andhra Pradesh – 515701

Mobile: +91 94402 43195

Background

Jasmine is one of the oldest fragrant flowers cultivated by man. *Jasminum sambac* (Gundumalli/ Madurai Malli) is popular in the southern states. The flower is used for various purposes viz., making garlands, bouquet, decorating hair of women, religious offering etc. Since the crop requires lots of manpower for harvesting and other operations, only small farmers are cultivating the crop. It is an ideal crop for small farmers whose land holdings are less than 1 acre. Pruning is essential for realizing the desired crop by removing old shoots and inducing flowers on the new ones. Manually pruning of jasmine bushes is labour intensive and time consuming. To tackle this problem, Shri Ramanjaneya reddy is cultivating Jasmine for the past 12 years and came up with an idea of a simple tool to aid time and cost-effective pruning in Jasmine.

Rationale

Normally, irrigation is withheld prior to pruning and plants are pruned by removing all past season shoots including dead and diseased branches. Pruning is practiced during the January



under Anantapur conditions to get increased yield and quality flowers. The pruning tool is made up of two iron rods bent in a circular shape. Pruning is facilitated by placing the ring around a jasmine bush and holding the branches close together by pulling and tightening the ring with the help of a mini tractor. Pruning of about 1775 plants/ acre is made easy with this tool.



Utility

The tool is made of iron, is portable and easy to handle and operate. In the manual pruning method, farmer engages 12 labour to cover 1 acre in six-man days. With the pruning ring, farmer is able to complete the pruning operation within a day by engaging 4 labour and a mini tractor. In older plantations (7th year onwards), labour requirement for pruning goes up to 25/ acre. Hence, with this tool there is a saving in labour expenses and time. The cost of the implement is Rs.1500.



Outcome

The farmer came up with this innovative idea to reduce drudgery, labour requirement and increase the efficiency of the operation. Net returns by using the implement have been higher (Rs.1.62 lakh/acre with the pruning tool compared to 1.0 lakh/ acre in manual). KVK, Anantapur (Reddipally) verified the practice and department of agriculture organized exposure visits of other farmers to Shri Ramanjaneya Reddy's field and as a result, several local farmers have taken up this innovative method.



Dispensing fertilizers made easy



Name: Tummala Ranaprathap

Age: 49 years

Education: MA

Land holding: 10 acres

Address: Vallapuram village
Wyra mandal, Khammam
Telangana

Mobile: +91 9948508221

Background

Chillies is an important commercial crop grown in Khammam district. To realize the yield potential of high yielding varieties farmers tend to apply fertilizers 3-4 times more than recommended dose which adds to the cost of production. Fertilizers are usually broadcast resulting in in-efficient use of the applied fertilizer. Placement of fertilizer in the root zone is the most effective method but due to shortage of availability of manual labour during peak farm operations farmers are unable to adopt this method of fertilizer application.

Rationale

Fertilizer dispenser is manufactured with locally available iron sheet and in appearance is like a funnel with a capacity of 15 Kg. This implement can be attached to three tinned harrow, the inter cultivation implement. Using the dispenser, fertilizer can be applied at the root zone of the crop while intercultivation operation is carried out. Fertilizer application through dispenser not only saves the fertilizers but also improves the fertilizer use efficiency while reducing the drudgery and cost of cultivation.



Utility

Application of fertilizers to chillies using the fertilizer dispenser requires less labour, cost effective by Rs. 500 per acre and takes less time for coverage while being easy to operate.

S.No.	Details	Manual application	Fertilizer dispenser
1	Mode of operation	Manual (Pocketing)	Fertilizer dispenser - Bullock
2	No of labour	4	2
	a. Men	4	1
	b. Women	-	1
3	Cost/acre (Rs.)	1000	500
4	Time taken/acre	6 h	1 h
5	Row coverage	Single	Two

Outcome

The efficiency of fertilizer dispenser developed by Shri Tummala Ranaprathap was validated by the KVK, Khammam (Wyra) and also by the officials of department of agriculture. He participated in several field days organized by the KVK and made fellow farmers aware of the utility of his invention. He appeared on TV shows and in radio programmes to popularise the fertilizer dispenser and also the Integrated Farming System practices he follows. The farmer received best farmers award at Mandal level on 26th January 2015 and won progressive farmer award by Telangana government on the occasion Telangana formation Day on 2nd June, 2016.



Planter cum Herbicide applicator



Name: Palsa Mallaiah

Age: 55 years

Education: 8th standard

Land holding: 14 acres

Address: Gummadavelly
village, Kandukur Mandal
Rangareddy Distirct

Telangana - 501506

Mobile: +91 9866617141

Background

The farming in Rangareddy district of Telangana state is predominantly rainfed and has been subject to the vagaries of weather frequently resulting in unsustainable crop production. Labour shortage during critical periods of crop growth and also the prohibitive cost of manual labour necessitates shifting to mechanical options especially for sowing, fertilizer application and pesticide/ weedicide operations.

Rationale

Palsa Mallaiah grows maize, jowar, pulses and vegetables in his 14-acre farm. Out of his necessity, he developed a seed cum fertilizer applicator with herbicide application. The assemblage has sowing shovels having spring loaded attachment with separate drive cum covering wheel for 3-row sowing. The implement is very useful on lands with two-way slope. A herbicide applicator with 150 litre tank capacity with 3-7 nozzles were mounted on the precision planter frame for simultaneous herbicide application. The implement ensures uniform application of the herbicide during sowing and thus saves time on both the operations. The cost of the applicator is .



Utility

The implement is useful in several field crops and orchards for sowing and herbicide application. The machine ensures considerable saving on time. It facilitates application of seed, fertilizer and pre-emergence herbicide at a time. Faster field coverage enables completion of timely seeding. Ensures placement of seed and fertilizer at proper depth. It can work well in two-way slopy lands because of individually operated spring-loaded tines. Separate seed and fertilizer boxes are available for inter-cropping. Separate seed metering plates are available for different crops. He gives it on hiring basis to other farmers at Rs. 800/h to raise additional income.

Outcome

The implement has become quite popular in the surrounding villages like Gummadivally thanda, Kolanguda, Pettulla, Chintulla, Kandukur and has been put to use by farmers all through the year. Technical backstopping was provided by KVK, Rangareddy.



Sprayer on wheels – improves efficacy of crop protection



Name: K. Mayilvahanan

Age: 36 years

Education: DME

Land holding: 17 acres

Address: S/o Kuzhandaivel
K.Puthur, Kunnam Taluk
Perambalur District, Tamil Nadu

Mobile: +91 8270739902/
9865287772

Background

Maize, cotton, small onion, bhendi, tapioca are the major crops cultivated by farmers in the Perambalur district. The farmer switched to papaya cultivation to realize higher income from his farm. He learnt the crop production techniques but experienced difficulty in taking up need-based crop protection after the plants grew tall which is commonly done with the help of hand or power sprayer.

Rationale

The farmer developed a mobile sprayer which consists of 3 HP motor mounted on a rectangular frame (150 x 75 cm) and four wheels having tubeless tyres. This enables easy transportation and eliminates the chance of punctures. A hose of 100 m length is connected with the motor and a plastic barrel and one edge of the hose is fitted with nozzle. While operating the motor, spray solution from the barrel is sucked and delivered through the hose. This spray reached even up to 20



feet height. Hence, the Papaya tree could be easily sprayed by using this sprayer. From the point of placing the sprayer plants in 100 m radius could be covered due to the extra length of the hose.

Utility

The most critical operation in fruit crop cultivation is to protect the crop from pest and diseases and application of nutrients and growth promoters to increase the fruit set. Repeated application of nutrients and pesticides through foliage is essential to obtain good yield. More than 90% of spraying is done through sprayers like knapsack and power sprayer and to some extent by rocker arm sprayer. These conventional sprayers are slow and require tedious manual cranking to operate. Another problem is acute labour scarcity. Under this scenario, the mobile sprayer is a welcome development for effective and good coverage of protection sprays in papaya and reduction in labour expenses. The sprayer cost is Rs. 35000.



Outcome

Since acid lime is also an important fruit crop of the Perambalur district, acid lime growers now use this sprayer. The successful case of sprayer on wheel was published in the monthly magazine “Uzhavarin Valarum Velanmai” in June 2017. Subsequently many enquiries started pouring in to both the farmer and KVK, Perambalur, which provided technical backstopping and support.



Mango craft – grafts on a single tree to produce multiple varieties



Name: P. Allimuthu

Age: 70 years

Education: 7th standard

Land holding: 5 acres

Address: S/o.T.Perumal
Minnakkal post,
Rasipuram Taluk,
Namakkal District
Tamil Nadu - 637505

Background

Thiru P. Allimuthu earlier cultivated paddy, tapioca and tomato in an area of 3 acre at Minnakkal. He gradually diversified his farm with fruit crops (mango, sapota, guava and aonla) and started raising and supplying fruit saplings for increased income. On observing irregular bearing in his mango orchard and facing price fluctuations in marketing, he started grafting other varieties on a single tree to produce fruit throughout the year to ensure regular returns.

Rationale

He went for top working and in situ soft wood grafting in irregular bearing mango trees in his 1.5-acre far for year-round mango production of different varieties. He tried 27 varieties of mango viz., alphonso, banganapalli, mulgoa, mallika, sindhura, sindhu, Arka Anmol, Arka Puneet, Jahangir, Ratnagiri Alphonso, Neelam, Bangalora, Salem banglora, rumani, imampasand, nadusali, Shajahan, padiri, Paiyur-1, ratna, kudhadath, totapuri, kallammai, kalapad, jailra, nattan and giri.



Utility

Thiru Allimuthu increased his net income to Rs.70,000 by producing multiple mango varieties and generated additionally Rs.1,80,000 from other fruit crops.

Outcome

Top working was practiced in 2000 mango trees per year across Tamil Nadu and Andhra Pradesh with farm sizes ranging from one cent to one acre. So far 10,000 trees were top worked and grafted for regular bearing of multiple mango varieties. Thiru Allimuthu imparted training in several types of grafting to 72 persons from 14 districts under the National Horticulture Mission. He was bestowed the prestigious Pandit Deen Dayal Upadhyay Antyodaya Krishi Puraskar by ICAR. His services are utilized as a master trainer in grafting fruit crops in training programmes offered by KVK, Namakkal.



Go Green – Organic vegetable cultivation



Name: P. Saravanan

Age: 50 years

Education: Higher Secondary

Land holding: 4.5 acres

Address: S/o. Th. K.Periyasamy
Muthuvel thottam
Ariyagoundampatti
Rasipuram Taluk
Namakkal District
Tamil Nadu

Background

Thiru Saravanan, a traditional farmer started cultivation of rainfed groundnut and tapioca under drip irrigation in one acre each. He showed interest in organic farming. Initially he lacked the experience of using organic manures and pest control in vegetable cultivation. With learning and experience, he slowly converted his entire farm as organic.

Rationale

Thiru Saravanan started with vermicompost production unit (50' x 20' size) using farm waste. This gave him the leverage of own compost for use on his farm (5 to 6 tonnes of vermicompost/year). He started using organic manures as basal and cakes such neem, pongamia, castor, illuppai and groundnut as top dress in turmeric in 20 cent area initially and slowly expanded the area to 1 acre. With experience behind him, he started organic cultivation of cucurbits such as bitter gourd, ribbed gourd and snake gourd in an area of 1.5 acres. Organic cultivation protocol included:



- Application of dilute solution containing castor cake 20 kg, Neem cake 6 kg and groundnut cake 5 kg, which was soaked in water for 5 days. At the time of application, the solution is diluted with water in 1:5 ratio and applied @ 1 litre/ plant. This practice is followed @10 days interval for all cucurbits.
- Application of 200 kg of vermicompost per 25 cent as basal and top dressing at 20 days interval
- Planting of Neerium as a border crop to absorb pollutants and also took up sowing of agethi & maize around the field as a barrier crop to prevent the entry of pest.
- Disease management in cucurbits is done by application of solution containing each 50 ml of Beauveria, Verticillium and Metarhizium + 1 litre of Panchagavya + 500 ml of butter milk through foliar spray @15 days interval.
- For the management of pest, installation of pheromone traps (@ 12/acre), fruit fly traps (@ 10/ acre), light traps (@ 2/acre) and water traps (@ 10/acre) to trap the flying insects.
- In addition to this, a paste containing each 250 g of ginger, garlic & chillies along with neem oil 50 ml + khadi soap 200 gm as sticking agent was prepared and diluted with water to be applied as as a foliar spray at monthly interval for pest and disease control.



Utility

Direct marketing of organic vegetables at Rasipuram Uzhavar santhai fetched good returns:

- In Ribbed gourd, harvest was 2 tonnes/25 cents area, sold @ Rs 40 to 60/kg & realized a net returns of Rs 47,700 in 3 months.
- In Bitter gourd, harvested an yield of 3.2 tonnes/25 cents area, sold @ Rs 50 to 70 /Kg & realized a net profit of Rs.92,000 in 4 months.
- In Snake gourd, harvested 2.7 tonnes/ 25 cent area, sold @ Rs.25/kg and realized a net profit of Rs.53,625



Outcome

It is very easy to follow the technology and the practices like vermicomposting, usage of bio inputs for various management practices by the fellow farmers.

Shri Saravanan obtained organic certification for his farm in 2016. About 175 farmers from Namagiripettai block of Namakkal started organic vegetable cultivation & applied for organic certification. Technical backstopping is being provided by KVK, Namakkal.



Multiple cropping system in Mango



Name: S. Vasudeva Reddy

Age: 55 years

Education: ITI

Land holding: 10 acres

Address: Pedda vanka Palli
Vyalpadu mandal
Chittoor District - 517234
Andhra Pradesh

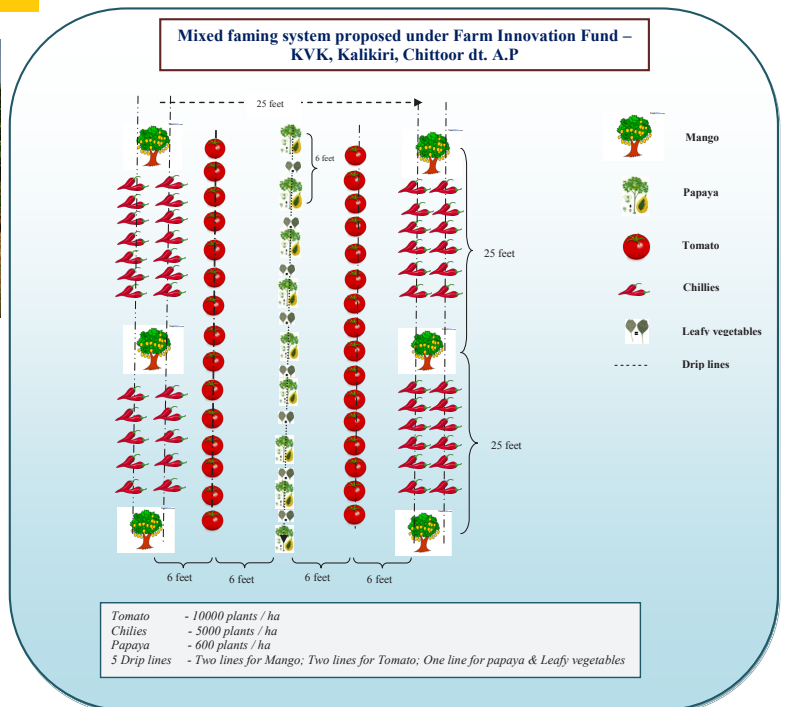
Mobile: +91 8247448666

Background

Mono-cropping of mango is becoming less remunerative due to adverse climatic conditions. Untimely rains during stress period is leading to poor flowering and unseasonal excess rainfall is leading to flower and fruit drop. Added to this, market price fluctuations is resulting in less income to farmer. A way out is to switch over to multiple cropping for enhancing resilience to climatic stresses and ensure stability of income.

Rationale

In multiple cropping, mango was square planted with a spacing of 25 feet. Papaya, tomato and chillies were planted as intercrops in mango. Leafy vegetables fenugreek, amaranthus and sorrel (local varieties) were planted within the rows of papaya. After harvesting of tomato, field bean crop was sown in the same rows of tomato. Totally 600 seedlings of papaya, 10000 seedlings of tomato and 5000 seedlings of chillies were planted in one hectare. Mango and intercrops were provided with drip irrigation.



Utility

With multiple crops in unit land, Shri Vasudeva Reddy realized additional profit during rest period of mango and stability in income due to the practice. Multiple cropping system allowed maximum utilization of available space in the field and optimum use of resources for maximizing returns. Against a B:C ratio of 3.6 with sole mango, multiple cropping gave a B:C ratio of 4.49. Additional income came from intercrops such as papaya, tomato, chillies, leafy vegetables and beans.

Outcome

The success of multiple cropping in mango is being validated in a farmer participatory mode by KVK, Chittoor with funding support from ICAR under farm innovation fund. Farmers of Kalikiri, Vayalpadu and Piler mandals of Chittoor district, Andhra Pradesh were sensitized on this cropping system and they expressed that this system is more profitable than their traditional practice. Six farmers from Piler and Kalikiri mandal adopted the practice of multiple cropping as per resources availability.



Mixed farming of vegetables



Name: Illa Somalamma

Age: 48 years

Land holding: 2.5 acres 10 cents

Address: W/o Illa Balaji

Pedageddhada village

Rampachodavaram Mandal

East Godavari District-533288

Andhra Pradesh

Mobile: +91 7382633693/
9493993523

Background

Brinjal is a major vegetable crop cultivated during *Kharif* season in the agency area of Rampachodavaram mandal, East Godavari District. However, taking cue from fall in brinjal market prices with a good harvest, Smt Illa Somalamma, women tribal farmer started mixed farming of vegetables on pandal system by following organic cultivation practices. She opted for crop diversification by reducing the extent of land under brinjal cultivation with other vegetables and realized better returns unlike other farmers in the local area.

Rationale

Mixed cropping of vegetables was practiced with bottle gourd raised on pandal system at a spacing of 2 x 2 m with alternative planting of beans and cowpea. In the interspaces of bottle gourd, vine cuttings of sweet potato were planted. By following this system, Mrs. Illa Somalamma, tribal women farmer utilized the available spay effectively. She reduced cost of cultivation by following organic cultivation practices like



application of manure, neem oil, use of panchagavya and jeevamritham. Stable returns were realized with mixed cropping compared to sole cropping of brinjal.

Utility

Mixed farming system led to effective utilization of available land and irrigation sources. Net returns of Rs 1,22,000/year with a B:C ratio of 2.41 was obtained with mixed cropping compared to net returns of Rs 78000/ acre/year and a B:C ratio of 1.95.



Outcome

The utility of mixed cropping system practiced by Smt. Somalamma was studied by KVK, East Godavari (Pandirimamidi) and was found to be an economically viable practice. Mixed cropping of vegetables on pandal system spread to many farmers in the tribal area.



Top Work– grafting on mango trees



Name: N.N. Narasimha Reddy

Age: 53 years

Education: Graduation

Land holding: 12.35 acres

Address: S/o N. Narayana Reddy

Nandimandalam village

Pendlimarri Mandal

Y.S.R Kadapa District

Andhra Pradesh

Mobile: +91 9959227734

Background

Poor bearing is a problem faced by mango growers in Kadapa district. Some of the accentuating causes include alternate bearing, climatic stresses and poor crop management all resulting in low productivity and low income to farmers. Consumer preference and remunerative market prices for local and export quality mangoes are other factors for consideration to make mango cultivation profitable in the Rayalaseema region.

Rationale

On-tree grafting allows production of mango varieties which have market demand and consumer preference. The improved



practice involves removal of a small portion of bark by making rectangular notch on the tree. Scion material from desired plant is separated and is then grafted. Marketable fruiting is obtained after 3 years of grafting.

Utility

Shri Narsimha Reddy produced multiple varieties by standardizing ‘on tree’ grafting in 4 acres of his 12-year old mango orchard. Grafting helped him to produce multiple varieties such as Neelam, Erra mulgoa, Malika, Alphonso and Himam Pasand. Out of the many varieties he tested, he preferred Himam Pasand to graft in existing orchards as it fetched better market price (Rs 100/kg). He realized Rs 74000 gross returns/acre in the 3rd year with a net return of Rs 32000/acre. The second crop after grafting gave higher returns and B:C ratio of 2.34 compared to 1.76 in the first crop.



Outcome

Shri Narsimha Reddy has been recognized with Shashi Bhushan award for this technique at the district level by District Collector and with innovator award by ANGRAU. On-tree grafting technique has been accepted and adopted by the by mango growers of surrounding four mandals. Farmers from all across the districts in AP visited his orchard and he is acting as a resource person for farmer trainings organized by KVK, Kadapa (ANGRAU).



Panchagavya – a health potion for poultry



Name : A. Mathiyalagan

Age: 58 years

Education: B.Sc (Chemistry)

M.A (Hist.), B.Ed, M.Ed

Land holding: 25 acres

Address: S/o. K. Arunachalam

No.252, Nadayanur

Manmangalam Taluk

Karur District

Tamil Nadu

Mobile: +91 9442577431

Background

Thiru Mathiyalagan is a poultry entrepreneur with 50000 layer birds and a feed mill of 5 MT/h capacity. Initially, he had been using antibiotics for controlling diseases in the poultry birds. As the feed became costly, he attempted using Panchagavya as an ingredient in the feed to induce resistance in the poultry birds against various diseases.

Rationale

Panchagavya was prepared as a concoction, formulated by mixing 5 products of desi cow plus spent fermented rice water that is rich in probiotics and lactobacillus. Panchagavya has been known for its crop growth regulating properties and other benefits. The farmer owned 6 desi cows and Panchagavya was prepared in his farm itself. Panchagavya was mixed in feed ration of the poultry birds on trial basis and was found to have health benefits. He saw recovery of diseased chicks as well when fed with the liquid. He standardized the dosage to be added and at present using Panchagavya 30 l per MT @ 3 ml/hen as an alternative to vaccines to his desi birds. This innovative practice has helped him to increase the profitability of his poultry unit.



Utility

Panchagavya is locally prepared on the farm. It can be easily mixed with feed and was found to afford protection to the birds from diseases. It is cost effective (Rs 300/ MT of feed) and also helped in achieving better feed conversion ratio in birds.

Outcome

Thiru Mathiyalagan received the SICCI Best Farmer Award for Karur district in 2016. His innovation was published in the popular agricultural magazine – Pasumai Vikatan. Expertise of the farmer was utilized as a resource person by KVK, Karur. Several poultry farmers were inspired to follow the practice of using Panchagavya in poultry units.



Liquid Gold - enhances profitability of floriculture



Name: V. Tamilarasan

Age: 50 years

Education: B.Lit., ITI

Land holding: 8 acres

Address: S/o Vadivel, 696 D
Bharathiyar Nagar, Ariyalur
Ariyalur District – 621704
Tamil Nadu

Mobile: +91 9865287772

Background

Thiru V. Tamilarasan started cultivation of tuberose, marigold, vegetables along with paddy and fodder crops in his 8-acre farm. He established a dairy, goatery, fishery apiary, vermicompost and azolla production units. Use of water soluble fertilizers available in the market not only increased the cost of cultivation of tuberose but also productivity increases could not be sustained. Earlier, the farmer used decomposed farm yard manure to broadcast in his field at the time of last ploughing. However, urine from the cattle shed was going unutilized. Thiru Tamilarasan came up with a system for recycling and effective use of cow dung and urine for high value crops.

Rationale

The established model allowed collection of cow dung and urine from the cattle shed, is filtered to free from residues, fermented and sedimented for 12 h to enrich with microbes. Three serial storage pits (cement) were connected to each



other (inflow & outflow) to convert dung and urine into liquid manure, which is pumped to tuberose field initially through pipes and later through drip as is done in fertigation method. Initially, Shri Tamilarasan started producing liquid manure in 200 l capacity barrel tanks by adding cow dung 10 kg, cow urine 25 l, 2 kg of Jaggery and sufficient water. Seeing the effectiveness in using liquid manure motivated the farmer to think and establish a larger capacity cement tank of 500 l. When cattle numbers in the shed increased to 11, he established a liquid manure recycling cement tank capacity of 9900 l. This permanent liquid manure production unit cost is around Rs.75,000.

Utility

The digested materials and effective microbial culture in the liquid organic manure helped the farmer to reduce inorganic fertilizer use by 50%. With liquid manure use, the earlier practice of using water soluble fertilizers at 10 days interval was changed to 30 days interval. Cost on water soluble inorganic fertilizers came down to Rs. 775 per month from Rs. 2325 per month. The farmer observed the other benefits of using liquid manure i.e, restoration of soil health, reduction in nematode and root rot disease incidence in tuberose.

Crop	Area	Yield (tonnes)	Gross returns (Rs.)	Expenditure (Rs.)	Net returns (Rs.)	BC Ratio
Tuberose	3 ac	32.4	19,44,000	3,46,917	15,97,083	5.60
Marigold	1 ac	4.5	90,000	27,000	63,000	3.33
Paddy	1 ac	3.15	50,400	25,000	25,400	2.01
Vegetables	1 ac	13.15	1,89,000	52,400	1,36,600	3.60
Dairy (milk)	11 cows	8100 l	2,02,500	39,440	1,63,060	5.13
Fish	1 ac	900 kg	1,35,000	29,000	1,06,000	4.65
Total			26,10,900	5,19,757	20,91,143	5.02

Outcome

Success of Thiru Tamilarasan drew farmers from neighbouring villages and districts to his farm. Exposure on his farm led 28 out of the 278 farmers to start production of liquid manure in small drums and use in their farms. Expertise of the farmer was utilized as a resource person by KVK, Ariyalur. He became a master trainer in training programmes on IFS at KVK, Ariyalur and his success story was disseminated through All India Radio.



Enriched vermicompost – farmer entrepreneur



Name: Bandaru Venkataramana

Age: 45 years

Education: Intermediate

Land holding: 12 acres

Address: S/o. Mallaiah

Thirumalapuram, Kuravi
Mandal, Mahabubabad District

Telangana

Mobile: +91 9052822233

Background

Chillies and turmeric are the two major commercial crops widely grown in Warnagal District. There is a high demand for organic manures for use in these crops. Wilt is a major disease limiting productivity in case of chillies. Turmeric too faces the problem of Rhizome rot.

Rationale

Bio-pesticide enriched vermicompost is prepared by mixing *Trichoderma viride*, *Pseudomonas* and neem powder with vermicompost. The enriched vermicompost is applied along with FYM to the soil to manage root rot and wilt in chillies and rhizome rot in turmeric. Thus this innovation is intended to address both the issues of supply of organic manure and also management of soil borne disease through the use of bio-pesticide enriched vermicompost. Improvement in soil physical properties and at the same time management of soil-borne diseases was made possible.



Utility

Application of enriched vermicompost, gave effective control of root rot and wilt in chillies and rhizome rot in turmeric. Shri Venkataramana is able to make a profit of Rs.80,000 per month and could give employment to 10 persons per month.

Economics of production

Construction cost of unit	Rs. 15 lakhs
Scale of production	100 tonnes/month
Employment creation	10 persons/month
Production cost- raw materials & others	Rs. 2,00,000/month
Interest on investment	Rs. 30,000/month
Net profit / month	Rs. 80,000/month
Profit per year	Rs. 9,60,000



Outcome

The product is widely accepted by the chillies and turmeric farmers of the village and its use has spread to other districts of Khammam, Warangal and Nalgonda in an area of 1,000 ha. The innovation has potential for scaling up as an allied enterprise for additional income and livelihood security. Shri Venkataramana got best farmer award for the year 2005 for his innovative practices. The innovation was validated and facilitated by KVK, Warangal (Malyal) and also the department of agriculture of the district.



Readymade organics – enriched manure bricks



Name: Nagaraju Thirumalasetti

Age: 40 years

Education: BA, LLB

Land holding: 3.5 acres

Address: Nagaraju

Thirumalasetti

Bayanapalli, C.K.Dinne

YSR Kadapa, Andhra Pradesh

Mobile: +91 9948719794

Background

Organic manures are bulky in nature and are to be applied in large quantities. Shri Nagaraju identified the problem of handling, transport and application of organic manures, a practice which is gaining momentum among farmers. Keeping this in view, he started preparing and marketing organic manures for readymade availability to interested practitioners of organic farming in the district.

Rationale

Bricks are made of cowdung, jaggery, gram flour and cow urine. Each brick weighs about 300g. The cost of production of one tonne bricks is about Rs.5,200.

Utility

Manure bricks can be easily transported and applied in field and horticultural crops. In case of application in orchards, bricks can be placed around the base of fruit trees, which allows for slow decomposition and supply of nutrients to plants. The locally made bricks can be stored and used when required.



Quantity and cost of preparation of 8 tonnes of manure bricks as an enterprise is as follows:

Component	Cost (Rs.)
Cow dung (3.5 tonnes x 8)	22400 .00
Jaggery (70 kg x 8)	22400 .00
Waste gram flour (70 kg x 8)	11200 .00
Hired concrete mixing Machine	1,200.00
Labour charges (8 labour for 6 to 8 tonnes)	1,500.00
Total cost	58,700.00
Gross returns	1,20,000.00
Net returns	61,300.00
B.C ratio	2.04

Outcome

A team consisting of Scientist (Extension) and Scientist (Plant Protection), DAATTC, Kadapa headed by Programme Co-ordinator, KVK, Kadapa along with district project manager (natural farming) of the Department of Agriculture verified the technology during 2017. About 70 other farmers have accepted the technology and adopted in surrounding villages in nearly an 100 ha area in Kadapa district.



Crop booster - Jeevamritham



Name: G. Raja

Age: 58 years

Education: SSLC

Land holding: 6 acres

Address: S/o. Gopalsamy

Periathottam, Vellalar

Naikenpalayam Post

Avaniperur, Melmugam Village

Edappadi, Salem

Tamil Nadu - 637 101

Mobile: +91 9488411288

Background

Jeevamritham, an organic crop booster usually made from combination of cow products is widely used by organic farmers. Thiru Raja tried jeevamritham preparation by addition of cereals flour and pulse flour to the conventional method of preparation.

Rationale

Jeevamritham was prepared by mixing cow dung (10 kg), cow urine (2 l), green gram flour (2 kg), native soil (2 kg), crude sugar (2 kg). The mixture is kept for three days and after that it is ready for application in field. The entire mixture of jeevamritham is mixed with 200 l of water and applied through fertigation tank and also supplied through open channel to the crops in 1.0 acre at 10 days interval to boost crop growth.

Utility

Thiru Raja found this preparation useful in paddy, coconut, tobacco and vegetables like brinjal, tomato and bhendi.



Expenditure on use of chemical fertilizer can be cut down. By using this preparation, Thiru Raja realized additional returns in vegetables (Rs. 3600/acre), paddy (Rs. 3900/acre) and tobacco (Rs. 8600/acre).

Outcome

The effect of Thiru Raja's formula for Jeevamritham on crop growth has been tested by fellow farmers in an area of 50 acres. About 30 farmers started preparing and using Jeevamritham in various crops.



“Sweet nothings” – Chemical free Jaggery



Name: Muddada Krishna Rao

Age: 42 years

Education: M.Com

Land holding: 23 acres

Address: Nimmatorlawada

Amudalavalasa mandal

Srikakulam District

Andhra Pradesh

Mobile: +91 9052822233

Background

Sugarcane is the major commercial crop in the village Nimmatorlawada and Jaggery preparation has been practised by most of the cane farmers as whole sale market facilities are available in the nearby towns. During the course of Jaggery manufacturing sodium hydrosulphite (hydros) is indiscriminately used by farmers beyond recommended limits (35 g hydros/1000 l juice) for clarification of cane extract to impart light golden yellow colour to jaggery. Often level of Sulphur di-oxide in jaggery exceeds beyond 50 ppm which is not suitable for human consumption as per the recommendations of Bureau of Indian standards. The Jaggery is usually moulded into 12-16 kg blocks for marketing which is not very convenient and portable for small scale consumers who need jiggery for home consumption.



Rationale

An innovative protocol of Jaggery making was developed by the farmer which starts with production of sugarcane with minimum use of chemical fertilizers along with incorporation crop residues and large quantities of farm yard manure. Shri Krishna Rao completely avoided the use of hydros as clarifying agent in sugarcane extract and instead makes use of mucilage from bhendi for this purpose. Jaggery is boiled for a longer time of 8-10 minutes than usual which gives it a light brick shade and the longer boiling time prolongs the shelf life too. Even while cooling jaggery is stirred for 40-45 min compared to 20-22 min in conventional practice followed by other farmers. This longer cooling time with constant stirring avoids crystallization and give the jaggery a smooth consistency. For unloading the jaggery after boiling, the farmer used an innovative method of shifting the hot pan on trolley to a side where the contents will be unloaded for cooling. This saves labour requirement of 4 persons. Jaggery is made into blocks of 500g, 1, 2 and 4 kg instead of 12 to 16 kg usually followed by other manufacturers. This makes the blocks more portable and convenient for purchase for household consumption.

Utility

Chemical free organic jaggery produced by Shri Krishna Rao is safe for consumption as it is free from sulphur dioxide, has longer shelf life and smoother and uniform consistency. It is available in smaller and more portable sizes of blocks and very convenient for household consumption. The economics of production of the organic jaggery are given below:

S.No	Particulars	Normal jaggery	Organic jaggery
1.	Quantity of sugarcane per pan in (t)	1.25	1.25
2.	Jaggery recovery per pan in (kg)	135	135
3.	Cost of preparation per pan(Rs./pan)	1500	1800
4.	Jaggery recovery per acre@ 30t cane/ac in kg	3240	3240
5.	Total cost of preparation (including sugar cane cost @2850 /t) (Rs.)	85,500	92,700
6.	Price of jaggery/ kg	32	40
7.	Gross returns (Rs.)	1,03,680	1,29,600
8.	Net returns (Rs.)	18180	36900

Outcome

The organic method of cultivation of sugarcane and preparation of jaggery has gained popularity in the village and spread to 86 farmers in the village. Shri Krishna Rao shared his experiences in Farmer - Scientist interaction conducted by KVK, Srikakulam and the Department of Agriculture under ATMA, Srikakulam district. He participated in Global Agricultural Summit at Ahmedabad during 9-10th Sept 2013 and also participated in national level exposure visits to the CRRI, Cuttuck and IARI, New Delhi. He appeared on Television 22 times in various TV channels that telecast his innovative practices. The farmer was conferred innovative farmer award during 2013, Rythu Ranga award during 2016 by Kisan Morcha in 2016 and best farmer award during Sankranthi puraskaram during 2017.



Enterprise combo – grain, fruit, milk, eggs and meat



Name: D. Manivannan

Age: 53 years

Education: SSLC

Land holding: 4 acres

Address: S/o. Dharuman, 153
Pillayar Koil Street
Sadhuperipalayam, Arni Taluk
Thiruvannamalai District
Tamil Nadu – 606 907

Mobile: +91 9361053327

Background

Thiru Manivannan found conventional agriculture in his 4 acre farm unsustainable. Low productivity, increasing costs of external inputs, and unremunerative market prices forced the farmer to opt for integration of farming systems comprising of agriculture, livestock and poultry enterprises. Reducing cost of cultivation, efficient recycling of on-farm resources coupled with year round income drove Thiru Manivanna to experiment with a mix of enterpsies in his small farm.

Rationale

Practice of Integrated farming system (IFS) is for optimum utilization of farm resources with backward and forward linkages with diversification bringing in reduction in costs, increase and stability in incomes. An area of 4 acres was



diversified with a mix of crop, horticulture, livestock, poultry and fishery enterprises with crop residue recycling (vermicompost), feed (azolla) and fodder production (mixed fodder) for generating on-farm resources and energy from bio-gas.

Utility

The components of integrated farming system (IFS) model in 4 acres boosted the income of Thiru Manivannan to Rs.4.5 lakhs:



Component	Area/ Unit size	Returns (Rs.)
Paddy	1 acre	25000
Mango	1.5 acre	1,25,000
Lime	100 trees	
Vegetable & flower crops	0.5 acres	
Sweet orange (fruits & cuttings)	150 trees	1,50,000
Mixed fodder unit for cattle unit (sale of fodder slips & milk)	0.2 acres	25000
Backyard poultry with hatchery unit (900 chicks/month)	1000 desi birds in 0.4 acre	75000
Goatery unit (slatted floor shed)	0.1 acre	50000
Fish pond	0.2 acre	

Outcome

Since 2013, Thiru Manivannan's farm has become a hub for learning with visits of farmers organized by Department of agriculture, horticulture, KVK and NGOs (TVSES, CIKS etc.). He has been closely working with KVK, Thiruvannamalai in training programmes as a master trainer on IFS. Tamil agricultural magazine "Pasmai Vikatan" published a cover story on his experiences and TV channels showcased his success story in their agriculture broadcasts. Thiru Manivannan has been a source of inspiration for many farmers in the district.



An exemplary Catch – Pond based IFS Model



Name: Abboju Brahmachari

Age: 36 years

Education: SSC

Land holding: 2 acres

Address: S/o Dakshinamurthy
Perikavidu, Rayaparathi Mandal
Warangal Rural District
Telangana

Mobile: +91 9640245452

Background

Large scale migration of rural youth to urban areas is a matter of concern in the district of Warangal in Telangana State owing to the uncertainty in agriculture and unstable income associated with weather vagaries. One solution to this problem was thought over by Shri Abboju Brahmachari of Perikadu Village who with the facilitation of KVK, Mamnoon attempted Integrated Farming System (IFS) for year-round income in addition to cultivation of rice and maize.

Rationale

In order to stabilize income and to utilize family labour effectively, the farmer started dairy, backyard poultry and fisheries activities in addition to rice and maize grown on his farm. The KVK, Warangal (Mamnoon) gave the technical support and facilitated the establishment of the IFS unit. The farmer was also given training on fodder production and silage preparation.

Utility

The IFS model developed by the farmer has been paying rich dividends in terms of higher and sustainable income. The different enterprise combinations in the IFS model and their economics are as follows:

S.No	Enterprise	Expenditure (Rs.)	Gross income (Rs.)	Net income (Rs.)
1	Dairy	80000	325000	245000
2	Poultry	180000	1077500	897500
3	Fisheries	45500	120000	74500
4	Silage making	2500	4000	1500
5	Fodder production	35000	180000	145000
Total (Rs.)		343000	1706500	1363500

Outcome

The innovative IFS model of the farmer has aroused the enthusiasm of the fellow farmers who are now eager to emulate. The efforts of the farmer have been made popular by the print and electronic media. He is acting as a resource person for the beginners in the aspect of constructing shed, selection of breeds, taking care of chicks, fishes and the marketing strategies to be adopted.



Suitable fodder species in rainfed red soil areas



Name: M. Madhava Reddy

Age: 28 years

Education: Intermediate

Land holding: 10 acres

Address: S/o. M. Chenna Reddy

Lingayapalli, Vallur

Kadapa - 516 293, Andhra Pradesh

Mobile: +91 8897196635

Background

Scarcity of green fodder in summer months is a serious constraint for milk production in Kadapa district. Farmers depend on dry paddy straw which resulted in low milk productivity of the animals.

Rationale

Interaction with KVK, Kadapa scientists led Shri Madhava Reddy to introduced high yielding and drought tolerant varieties of fodder, viz., CO-4, CO-3 and APBN-1 Hybrid Napier in one-acre land to provide green fodder to dairy animals. Green fodder availability was ensured throughout the year.

Utility

Yield of 100 tonnes was obtained from 7 harvests within a year. The fodder was fed to dairy animals after chaffing.



Fodder wastage was reduced by 30%. The per animal milk productivity on his farm increased and sale of excess green fodder to other dairy farms brought in revenue realizing a B:C ratio of 3.3.

Outcome

Shri Madhava Reddy is now motivating other farmers and supplies fodder slips to the them to similarly benefit from cultivation of these suitable fodder species in red soils. The usage of high yielding variety of CO-4, CO-3 and APBN-1 Hybrid Napier for green fodder cultivation has become popular among 52 farmers from 15 villages of 4 mandals in 76 acres.



Diversification – key for income stability



Name: N. Nageswara Raju

Age: 45 years

Education: BA

Land holding: 13 acres

Address: S/o. N. VenkataRaju
Rajulakandriga
Karvetinagaram Mandal Chittoor
District, Andhra Pradesh
Mobile: +91 9441866909

Background

Papaya is a profitable crop in Chittoor district. However, disease incidence coupled with high cost of cultivation are problems faced by papaya growers. Shri Nageswara Raju diversified his papaya cultivation by introducing marigold as an intercrop and taking up allied enterprises such as dairy, vermicomposting, nursery.

Rationale

Dependence on sole cropping and single enterprise is no longer profitable in Chittoor district. Intercropping in long duration crops with seasonal crops like marigold brings in regular returns to meet the working capital requirements in allied enterprises established in the farm. In house production and sale of vegetable and fruit plants reduced cost of cultivation and also helped in realizing additional income from sale of surplus seedlings. Linking of dairy with vermicomposting for recycling of farm waste led to production and use of organic manure for high value crops and also increased farm revenue. Cultivation of high value irrigated crops such as papaya and

marigold was made sustainable by harvesting rainwater in farm pond and efficient use of harvested water through drip irrigation.



Utility

Farmer cultivated papaya in one ha area and obtained a yield of 287.5 tonnes/ ha over a period of 2 years and obtained net returns of Rs.5.0 lakhs. He intercropped papaya with marigold and obtained 10 tonnes/ha of flowers and at an average sale price of Rs.60/ kg, the additional net returns were Rs.1.5 lakhs per ha. The high cost of cultivation of papaya was compensated through the additional returns obtained from marigold as intercrop. Allied enterprises contributed to reduction in cost of cultivation and also additional returns to the farm income. The farmer realized Rs 18.4 lakhs in a year from his 13-acre farm.



Outcome

The model and the technologies adopted by the farmer were followed by other farmers of nearby mandals i.e. Penumur, Palasamudram, G.D.Nellore, Puttur, R.C.Puram and SRPuram in the district.



Scientific Pig farming - a pioneer takes the challenge



Name: R. Muthiah

Address: S/o. S. Ranganthan
Rema Livestock farm
Indra Nagar, Kallal
Sivagangai District, Tamil Nadu
Mobile: +91 7010303754

Background

In Shivagangai district, pig population is only 0.4% of the 8.2 lakh animal population. Not many farmers are interested because of the stigma attached. Shri Muthiah took up the challenge and demonstrated that pig farming is a scientific and profitable venture in the dryland areas and paved the way for others.

Rationale

Several innovations in housing, feed and waste management were introduced by Thiru Muthiah. He maintained a separate pen for sows, boars and for farrowing with both covered floor area and open yard area in a scientific manner. After weaning (3 months) the piglets are reared by free range method up to marketing age. Weaned pigs are let loose in the shade in coconut and mango garden during the day and confined in night shelters. The free-range method was beneficial to animal

behaviour and health and also did not necessitate higher capital investment for sheds. Despite 10 % reduction in growth rate, marketable weight of 100-120 kg is achieved in 12 months period. Lean meat fetched a higher price (>20%) in the market. Feed cost was reduced by truck lifting waste from hotels and colleges. Differential feed regime was implemented. Fattening pigs were fed swill feed & crop residues. Breeding pigs were supplemented with concentrate feed prepared from cereals wastes, crop residues, and bran with addition of 2 % mineral mixture. The cost of production thus reduced by 50 % and doubled the profits. Innovative waste management included collection of pig manure through proper drainage method, stored and utilized for preparation of organic compost rich in nitrogen and sale @ Rs 15/kg additionally earning Rs 75000 annually by producing 5.0



tons of organic manure. Critical care is essential for newborns in pig rearing and this was achieved by having a snooze deck provide artificial warm environment for newborn piglets which kept mortality rate below 5%.

Utility

Direct marketing of live pigs and pork to the consumers added to the returns from piggery unit. Thiru Muthiah sells 200 pigs every 2 months and earns about Rs. 6.00 lakh per annum with benefit cost ratio of 6.5.



Outcome

Grip over production gave him the confidence to start a hygienic slaughter hall locally to meet the increasing consumption demand locally and reduce dependency on Kerala market. Innovation in pork packing techniques like vacuum, tin/ can packing were also brought in to fetch higher prices. His farm became hub for learning for other farmers and interaction for scientists from TANUVAS and KVK, Sivagangai. About 106 farmers visited his farm and got exposure to scientific pig farming. In recognition of his efforts, Thiru Muthiah received innovative farmers' award during the Krishi Unnati Mela 2017, received the Best Farmer award from Government of Tamil Nadu during TANUVAS Foundation Day 2015. His success story was broadcast on AIR, Madurai and DD Pothigai, Chennai and Makkal TV.



Goat farming- elevated to hygienic level



Name: Moola Mahendra Reddy

Address: House No. 1-75
Chandippa, Sanagappaguda
Sanakarpalli Mandal
RangaReddy District
Telangana

Mobile: +91 8008639618

Background

Rangareddy is a drought prone district in the state of Telangana where failure of crops due to dry spells and erratic monsoon have been very common. Goat farming is one of the sustainable income generating options available with farmers to tide over unforeseen situations arising out of aberrant weather. Lack of awareness on the shelter management and feeding techniques often leads to heavy mortality in the goats incurring losses to goat farmers.

Rationale

The innovative goat farmer Shri Moola Mahendra Reddy conceived the idea of raised platform sheds for housing goats which helped maintain good aeration and hygiene. He used clean water and fodder produced on his own farm to feed the goats and maintained young kids in separate sheds for two months.



Utility

The modified semi-intensive grazing technique in elevated sheds following his own rationing system (mix of dry and green fodder) reduced mortality of goats to below 2%. The cost of shed and initial investment on purchase of goats was recovered in 2 years period. Four rural youth are employed in the unit continuously creating livelihood opportunity to them. The farmer is able to market his goats at the site of the unit itself through web enabled media (whatsapp).

Cost of production and returns from goat farming:

No. of Goats	Cost of production (Labour, fodder, medicines, management expenses) (Rs./year)	Returns from sale of goats (Rs./year)	Net returns (Rs./year)
100	6.0 lakhs	14.0 lakhs	8 lakhs

Outcome

The innovative methods followed by Shri M. Mahendra Reddy have been assessed and acknowledged for their efficacy by the officials of State Department of Agriculture/Animal Husbandry, Agricultural University students, trainees of MANAGE and contact farmers of KVK, RangaReddy. The farmer has been acting as resource person for State Animal Husbandry Department in the District. He meets 20-30 farmers every week and gives suggestions on improved goat farming methods. He received Rytu Nestam Best Farmer award in 2015 and also Best Farmer award from CRIDA, Santoshnagar, Hyderabad in 2016 for his innovative Goat rearing model. KVK, RangaReddy is closely working with the farmer.



Participatory technology development – feed formulation for dairy



Name: M. Nagi Reddy

Age: 55

Education: 7th standard

Land holding: 5 acres

Address: Meerapuram
Banaganapalle mandal
Kurnool District, Andhra Pradesh

Mobile: +91 9441374755

Background

The village is under scarce rainfall zone and also rain shadow area of the Kurnool district. Dairy has become an important source of income in this drought prone area. However, milk productivity is low due to imbalanced feeding regime practiced by farmers. High cost of concentrates is resulting in increased cost of milk and resultant dip in returns. Cost-effective balanced feeding is the only answer for increasing milk production at affordable cost.

Rationale

Ration balancing technology was adopted for formulation of ration for individual animals. Two Ongole and two Jersey cows of Shri Nagi Reddy were selected for the demonstration by KVK, Kurnool. Body measurements of each animal were recorded before start of the project to calculate body weight using Shaeffer's formula $L \times G^2 / 600$. Blood samples were collected for nutrient analysis. Based on the body weight, milk



production, fat in milk and stage of lactation, balanced ration was formulated using android application “Ration Formulator” developed by Sri Venkateswara Veterinary University. Ration was fed for 30 days in the form of total mixed ration (TMR). After 30days, the data was collected on body weight gain, milk yield and fat in milk. Shri Nagi Reddy actively participated in testing of this feed ration formula.

Utility

The total mixed ration was profitable with reduced cost of cultivation and increased net income of Rs. 4432 per Jersey cow and Rs. 2654 in case of Ongole cow.

Jersey cows

Particulars	Before	After
Total cost of feeding/cow	1693.4	1309.25
Total income/cow	4026.0	5742.0
Net income/cow	2332.6	4432.75

Ongole cows (30 days)

Particulars	Before	After
Total cost of feeding	1032.6	975.25
Total income	2046.0	3630.0
Net income	1013.4	2654.75

Outcome

The technology is well accepted by the farmer as it benefitted in improvement of milk yield as well as net income. Farmers from other villages visited the project site, interacted with Shri Nagi Reddy and replicated the the technology in their dairy farms.



సంతుష్ట పంటపొంపగుల వివరణము

గ్రామ పేరు	గ్రామ పేరాలు
వినువాపూ	M.నాగిరెడ్డి
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పంట	1.5
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పొయ్యి	పొయ్యి
పొయ్యి (కో)	పొయ్యి (కో)
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0.01	0.014

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గ్రా : కామ (సంఖ్య) = 60 :40

Cover the Soil for Resource Conservation



Name: D. Chengal Reddy

Age: 67 years

Education: SSLC

Land holding: 10 acres

Address: S/o. Valasa Reddy
Puligundlapalli, Chittocherla
Chinnagottigallu mandal
Chittoor District - 517194
Andhra Pradesh

Mobile: +91 9985489748

Background

Chinnagottigallu mandal is one of drought prone mandals in Chittoor district with an annual rainfall of 770 mm. Tomato is the major vegetable crop covering an area of 267 ha with productivity of 45-55 t/ha. Water scarcity is a serious concern for vegetable cultivation. In young mango orchards, growing tomato as an intercrop is a common practice in the district. However, limited water availability for irrigation is to be overcome for making tomato cultivation profitable.

Rationale

Mulching and adoption of micro-irrigation help increase water productivity. Both plastic and organic mulches were tried in tomato intercropped in young mango orchard by Shri Chengal Reddy. The practice helped in conserving soil moisture, nutrients and control weed problem effectively at critical stages of crop growth. Plastic mulch of 0.25µm thickness, dual surface grey-on-black sheets were used along with paddy straw as organic mulch. Tomato hybrid was planted at spacing of 90 x 30cm in Mango garden.



Utility

Mulching helped in cutting down frequent irrigation, conserve precious irrigation water and saved Rs. 15000 per ha on weeding. Marketable yield in tomato increased by 13.4 to 19.4% (75.9 t/ha) with the practice of mulching compared to tomato without mulching (63.6 t/ha). Additional net returns of Rs. 54156 was realized giving a higher B:C ratio of 2.56 against 2.39.

Outcome

At present, 10-20 farmers are using this technology in other vegetables like Brinjal, Chillies and Musk melon and flower crops like Marigold to conserve soil moisture as well as to reduce the labour for weeding. KVK, Chittoor (RASS) is popularizing this practice among farmers in village clusters through NICRA project.



Peel and prosper – processed onion boosts returns to farmers



Name: M. Raja

Age: 36 years

Education: Graduation

Land holding: 15 acres

Address: S/o. Muthusamy, Irur Alathur Taluk, Perambalur District, Tamil Nadu – 621104

Mobile: +91 9843409384

Background

Small Onion is cultivated in an area of 8000 to 9000 hectares in the Ariyalur district of Tamil Nadu with an average production of 70,000 tonnes. Farmers spend about Rs.1,00,000/ha on its cultivation. When the harvest is good, farmers loose much as prices fall steeply. However, when production is low, middle men pocket the maximum share of price increase. Price fluctuation is the biggest worry for small onion growers. Prices tend to fall as low as Rs. 5/kg and sometimes farmers are unable to make labour charges for harvesting. To address these concerns, Thiru Raja brought the fellow farmers together and formed a Farmer Producer Company for processing and value addition of small onion.

Rationale

Products such as onion flake, onion paste and powder have increased shelf life so that farmers can store the processed items for longer period and market them when prices are



remunerative and also tap export market. Processing of shallots viz., cleaning and peeling is tedious and requires skilled labour. Hotels and large food establishments prefer processed ready to use peeled small onions to save labour and cut costs. Mechanically processed and peeled onion with vacuum packing has good scope in the restaurant industry. Shri Raja was committed to overcome the problems faced by small onion growers and approached Indian Institute of Food Processing Technology (IIFPT), which provided much needed technical support by providing an onion multi-level processing structure tailored to his needs. Solar drying, grading, peeling of outer dry sheath and vacuum packing free from preservatives was made possible. The finished product has a shelf life of 15 days as certified by the IIFPT, Thanjavur. Other products apart from peeled onion included onion flakes, paste and powder.



Utility

The FPO (Maize & Small onion farmer producer company) at Chettikulam village, Perambalur has one thousand farmers as members. A whopping 632 farmers are Small onion producers. Collectively the group is able to realize better prices from the market, store their produce and processed products bidding goodbye to distress sale. Thiru Raja made it possible to increase the farmers share in the consumer price.

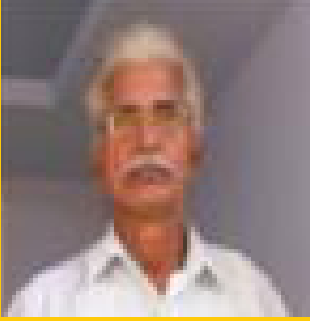
Parameter	Normal Price (Rs./Kg)	Peak Season price (Rs./Kg)
Middle men procuring	35	10
End Consumer market	80	35
Processed (peeled) onion through direct marketing	90	50

Outcome

At present, produce of 12 farmers is processed and marketed directly to hotels in the district. With wider publicity in print and electronic media, supply orders increased for peeled small onion from distant markets in Chennai and Kerala. With support for uninterrupted power supply, the FPO is contemplating processing of 2 to 4 tonnes of peeled onion per week. At full capacity of operation all the 632 members are likely to benefit. KVK, Perambalur is extending production technology support to the FPO members.



Waste to Wealth – organic shampoo from Banana peduncle



Name: C. Arumugam

Age: 68 years

Education: SSLC

Land holding: 1.5 acres

Address: Puthuvilai
Thalakkulam Post
Kanyakumari District
Tamil Nadu

Mobile: +91 8344021003

Background

Banana peduncle is regarded as a waste discarded by growers and vendors. Thiru Arumugam did not think so. He converted this bio-waste both from banana orchards and vendors into a fast-moving consumer good (FMCG) in the locality.

Rationale

Banana waste peduncles are collected, shade dried and incinerated. The residue is collected, ground into fine powder, sieved and packed as a toiletry product.

Utility

100 kg waste banana peduncle (wet basis) yields about 500 g ash which when formulated and marketed fetches Rs 3000.



Outcome

Thiru Saravanan received appreciation from District Collector, Department of Agriculture, TNAU, ICAR and other organizations. The idea has spread throughout Tamil Nadu. More than 350 farmers are practicing it. Thiru Saravanan received Siddha Maruthuva Mamani Award by the Indian Medical Council, Farmer Teacher Award and Best Farmer Motivator Award (2015) by KVK, Kanyakumari.



Ready to eat, ready to cook – millet value addition



Name: A.Bhagya Lakshmi

Age: 36 years

Education: M.A.

Address: W/o. A. Raju

Chemumiya peta

Kadapa-518001, Andhra Pradesh

Mobile: +91 8522007266

Background

Millets are known as nutri-cereals. Due to awareness, their traditional importance in diet is rising. Demand for a healthy diet and living is bringing back millets and their value-added products onto the table. Smt Bhagya Lakshmi realized this when she was in search of self-employment.

Rationale

Processing and value addition of millets started as a home scale production with three products and slowly expanded to include ragi laddu, sugar free biscuits, parched jowar laddu and ragi vermicelli and mixture. She branded and registered her products obtained FSSAI certification. She brought several innovations into practice in the ethnic home style foods compared to the industry practice. Use of maida was cut down, its substitute wheat flour was also reduced by 50% and replaced with ragi, bajra, kora and Jowar flour making it a multi grain mixture. Sugar was substituted in biscuits with natural sweetener Stevia and ghee with iron rich dates. She added Ashwagandha, flax seed and oats in millet bisquits to improve taste and nutrition.



Utility

Smt Bhagya Lakshmi initially placed the value-added products in local shops and KVK, Kadapa (ANGRAU) supported in marketing at Rythu Bazar, RIMS hospital and Collectorate offices. With growing demand for her quality products, she could form a small value chain from farmers to consumers. Her initial setup started with a loan from DWCRA. Later, she received funding support from MEPMA and DRDA Velugu Kadapa. The enterprise established by Smt Bhagya Lakshmi, provided employment to 5 persons on a daily basis and in the first year she could realize a net income of Rs. 2,45,000.

Particulars	Rs. / month	Rs. / year
Fixed cost		
Oven	20,000-00	-
Kitchen equipment	10,000-00	-
Depreciation 5% per year		1500
Recurring Expenditure		
Raw materials	50,000	6,00,000
Transport	1,000	12,000
Gas and electricity	2,000	24,000
Assistant salaries @ Rs.150/ day * 5 No's * 25 working days	18,750	2,25,000
Miscellaneous material (packing and labeling)	5,000	60,000
Wastage cost @ 2% per year on 50,000 raw materials/ month	1,000	12,000
Total depreciation and wastage per Year		13,500
Rent for room 12'x10'	1, 000	12,000
Total Expenditure		9,58,500
Gross Income (Sale turn over)	1,00,000	12,00,000
Net income (gross income- expenditure)		2,45,000
Cost benefit Ratio		2.45:1

Outcome

Smt Bhagya Lakshmi regularly shared her expertise and experiences with trainees of KVK in more than 25 training programmes covering 1000 participants from Kadapa and all other districts in Andhra Pradesh. Her millet products are displayed in several exhibitions. KVK, Kadapa (ANGRAU) played a pivotal role in her success. Inspired by her success, three other entrepreneurs started home scale production of millet value added products. Quality of products is regularly tested and certified which is attracting demand from students going overseas for studies.



Chips maker - value addition in Cassava



Name: J.R. Dhanraj

Age: 67 years

Education: SSLC

Land holding: 10 acres

Address: S/o. A. Rangaswamy
Periyappukkadu, Kalkurichi
Vellalapatti post, Belukurichi
via Sendamangalam Taluk
Namakkal District
Tamil Nadu - 637402

Mobile: +91 9443469132

Background

Tapioca/Cassava is one of the major tuber crops cultivated in Namakkal district of Tamil Nadu. It is cultivated for industrial as well as edible purpose. Fall in prices forced farmers to go for processing and value addition. Thiru Dhanraj designed a machine to cut chips from tapioca tubers for longer storage with good keeping quality. Further, value addition paved the way for higher returns.

Rationale

Cassava chips cutter is electrically operated powered by 1 HP motor. Cutting thickness capacity is 0.5 tonnes/day. Cutting thickness ranges from 1 to 25 mm. The chips cutter is easily fabricated locally. Efficiency of the machine is 200 Kg (single pipe) and 400 Kg (double pipe) at 3 mm thickness. Chips are dried uniformly and degradation of starch is reduced. Thiru Dhanraj came up several value added products from cassava (biscuits, cakes, halwa, murukku and chilli).



Utility

The machine is portable and can be transported from one place to another place quickly. Needs minimum labour for processing (1 male labour against 2 male and 2 female labourers in conventional method). The chips thickness can be altered from 1 mm to 25 mm (at uniform size) according to various purposes (chips, cassava powder & concentrate feed for livestock). Locally made with available materials (stainless steel). The chips can be used for cattle feed without any contamination (in manual chips cutting - the chips get mixed up with sand). Chips can be stored up to 6 months without any fungal infestation. The machine can be operated with electricity and also with oil engine (petrol/ diesel). It can be used for cutting/ slicing of other vegetables such as gherkins, and mango for pickling/ preservation. Cost of the machine Rs.10,000. Dry recovery @ 60% of raw tubers. Selling of raw tubers (16 tonnes/ acre) fetches 1,12,000 (sold at Rs. 7/kg) and net returns of Rs 60000 with a B:C ratio of 2.15. After value addition, processed chips (9600 kg recovery) are sold at Rs 30/kg fetching gross returns of Rs. 2,88,000 and net returns of Rs. 2,26,000 with a B:C ratio of 4.64.



Outcome

Thiru Dhanraj received appreciation from district collector and works closely with KVK, Namakkal. He has been recognized as Best Innovator by IIHR, Bangalore. He is a recipient of SRISTI SAMMAN award by Hon'ble President of India in 2014. Cassava chips cutter has been displayed in Agri Intex and Coddisia exhibition at Coimbatore. The technology has been disseminated to about 400 farmers.





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