

RESEARCH ARTICLE : **Farmer innovations in Karnataka**

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SUMMARY : The study was conducted in four district of Karnataka namely: Davanagere, Shivamogga, Gulbarga and Tumkur to identify and document gross root farmer innovations. Case study method was employed in the study and data were collected through personal interview. In all seven innovations were recorded in detail considering cost, utility and adaptability. The innovations namely, red gram ripping machine, high density planting in arecanut, solar operated insect trap, environment friendly natural phenyl, millet malt, arecanut and coconut tree climber, paired and pentagonal planting system in coconut, power operated weed cutter were documented. The study revealed that by using red gram nipping device 6 acres can be covered instead of 1 acre manually per day. In high density arecanut planting system 1500 seedlings can be planted in place of 550 seedlings in conventional method. The value addition to brown top millet has increased selling price by 10 times when compared to selling raw millet. Through using coconut and arecanut climbing machine, tree climbing has been increased four times and free of physical injuries. In paired and pentagonal planting system the farmer has planted total of 200 coconut without using mainland and efficiently utilizing bunds and farm roads in 5 hectares land. It is observed that these farmer innovations are generally environment friendly and easily adoptable.

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BACKGROUND AND OBJECTIVES

Farmers innovations play vital role in development of agriculture, these innovations were cost effective and economically viable. Historically, these innovations were developed to solve the problems faced by the farmers and passed on from generation to generations. In each stage innovations were modified according to their needs, convenience and profitability. Those innovations which were non-feasible economically found extinction from the practice. Farmers innovations brought considerable profit and livelihood for those who

have poor resources. The fast changing agriculture sector with multinational company culture considered to be serious threat to survival of innovations developed by the farmers. Survival of innovations also depends on wider adaptability and economic returns to farmers. In this regard extension agency play important role in popularization of farmers innovations among farming community. Documentation and validation of farmers innovation assumes significance and helps farmers economically.

Most of the farmer innovations were having cost effective, greater utility and more

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sustainable rather than the available scientific technologies (Saravanakumar and Alagesan, 2017). ICAR-Krishi Vigyan Kendra, Davangere district started documentation of farmer innovations to give wide publicity through various extension activities.

Objectives:

To document and understand the farmer innovations.

RESOURCES AND METHODS

Case study method was adopted in this study. Among the documented innovations data base by Krishi Vigyan Kendra, a total of seven innovations namely, red gram nipping machine, high density planting in arecanut, solar operated insect trap, environment friendly natural phenyl, millet malt, arecanut and coconut tree climber, paired and pentagonal planting system in coconut, power operated weed cutter. All the seven farmer innovators were personally interviewed and specific characters of innovations were recorded.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Red gram nipping device:

Red gram is the important pulse crop of Karnataka state and grown commercially in North Karnataka. Vegetative growth of the crop need to be stopped by nipping at 70 days after sowing in order to get more branches which helps to increase yield. The process of nipping is labour intensive and thereby farmers were not taking up nipping and resulted in loss of yield. Mr. Sharanabasappa Peerappa Patil from Halasultanapur village of Kalaburgi district designed battery operated 'Red gram Nipping Machine'. This gender friendly device weighed 2.5 kg and consists of steel rod of 1 meter length, one end is provided with rotating wheel with blades and other end is having switch and handle connected to chargeable battery. Manually, 1 labour is required for nipping of 1 acre whereas by using nipping device 6 acres can be covered per day. Since 7 years the farmer is selling this device at Rs. 1,800/- per unit. The device can also be used in other pulses and vegetables.

High density planting in arecanut:

Conventionally, arecanut is planted in the spacing of 9' x 9' which accommodates 550 plants per acre and in most cases the inter space is left vacant without any intercrops resulting no income to farmers in the initial 6 years. Mr. Thimmesh K.N. from Kadajji village of Davanagere taluk with his innovative thinking adopted high density planting system in arecanut. This system consists of paired row planting at 6 feet spacing and one more paired row planting 18 feet apart in zig-zag planting. In the 18 feet interspace in the initial years farmers having enough space and grown sugarcane and banana and realized income continuously. After 6 years, when arecanut starts yielding, he has taken up one more row arecanut planting at 9' row spacing and 6' between plants. This system accommodates 1500 plants per acre and successfully realized higher yield and income since 10 years.

Solar operated insect trap:

Loss of yield due to incidence of pest in agriculture is a great concern for farming community and this is coupled with indiscriminate use of pesticide in eroding profit share of farmer in one side and environmental hazardous on the other hand. Mr. M.G. Karibasappa from Malebennur village in Harihara block has developed environmental friendly solar operated insect trap which can be used in agricultural and horticultural crops. The device consists of 5 feet iron rod attached with solar panel and hanging solar bulb with battery. Below the solar bulb a container which is filled with water mixed with soap or shampoo. During the night when the bulb glows automatically the insect flies are attracted to light and fell into container and eventually dies. The only mechanical work that farmers have to do is to replace water in the container once in 2 days. Since 3 years 450 farmers have purchased this device costing Rs. 4500/- and used in their fields and effectively managed pests in both agriculture and horticulture crops.

Environmental friendly natural phenyl:

Mr. K. Shankara Narayaan Bhat Majjigehole from Agalubagilu village in Thirthahalli block of Shivamogga district conserving 'Malenadu gidda' a traditional cow breed since 10 years. He is preparing several medicine by using traditional cow urine. The farmer is preparing and marketing natural phenyl. This is prepared by using

16L traditional cow urine mixed with 100 betel vine leaves and 750 g *Neem* leaves crushed and soak solution for 1 hour. Then the solution is filtered and boiled until the solution reduced to 10L. The boiled solution is mixed with 11L traditional cow urine collected in the morning hours which is concentrated and 1L natural concentrated phenyl. This solution is kept for 1-2 hours and packed in container and natural environmental friendly phenyl ready for sale. The farmer has developed this process as rural entrepreneurship model for the last 10 years.

Millet malt:

Mr. H.K. Raghu from Hendore village of Sira block in Tumkur district is having 3 ha., of land and grows all types of minor millets. Sira block having normal rainfall of less than 500 mm favours minor millet crops. Normal process the farmers follow is to sell the minor millets immediately after harvest. Mr. Raghu, instead of selling raw brown top millet has taken up preparation of malt. This is prepared by making brown top millet powder mixed with jiggery and cardamom and this malt can be used as juice and useful for persons having diabetic and blood pressure. The 500g and 250g malt packets are sold

directly to consumers. The value addition to brown top millet has increased selling price by 10 times when compared to selling raw millet.

Arecanut and coconut tree climber:

Arecanut and coconut are the important plantation crops especially in costal and southern part of Karnataka. These crops grow upto 60 to 70 feet tall and harvesting remains problem for the growers. The intensity of problem increases during rainy season as the harvest season of arecanut starts from August and extends upto December and coincides with monsoon. Nut harvesting in coconut is a continuous process and in arecanut it varies from 3 to 4 times. Mr. Nitin P. Harle from Gajanur Village in Shivamogga district has developed coconut and arecanut climber, which consists of iron stand and foot rest and a chain to tie the tree is made from iron attached to stand and length of wire is adjustable depending upon size of trees. A man can sit on the machine and harvest the nuts. Through using this machine tree climbing has been increased four times and free of physical injuries. Presently, farmer is selling this machine at Rs. 8000/- per unit.



Fig. 1 : Farmer with pentagonal planting system in coconut



Fig. 2 : Farmer innovator demonstrating arecanut climbing using machine

Paired and pentagonal planting system in coconut:

Normally coconut plantation is done in three methods namely rectangular, square or quintex system. Further if it is chosen for border planting single planting at closer or wider distance. In some situation double hedge method of planting is also practiced. Mr. M. K. Renukarya, from U. Kallahalli village of Harapanahalli block in Davanagere district adopted paired and pentagonal planting system in coconut. In this case in order to better utilize the



Fig. 3 : Environment friendly solar insect trap installed in tomato plot

available land, border planting of coconut is thought of, but with an innovative idea of paired and pentagonal planting (cluster planting).

In paired planting system 2 coconut seedlings were planted at 6 feet spacing and next pair was planted at distance of 33 feet along the bunds and farm roads. In pentagonal planting system 4 coconut seedlings were planted in four directions in 8 feet spacing and in the middle the 5th was planted. In pentagonal system single basin comprising of all 5 plants was prepared for application of inputs like water, manure etc. In paired system four trenches were dug in between two plants with measurement of 4 feet length, 2 feet width and 1 ½ feet depth. These will act as micro catchment for collecting rain water. Agricultural wastes were dumped in these pits and they act as composting sites. The whole basin was covered with fallen coconut fronds and other wastes there by rendering zero cultivation practices. The farmer has planted total of 200 coconut in 5 hectares land without using mainland and efficiently utilizing bunds and farm roads.

Power operated weed cutter:

Arecanut is the important plantation crop in Karnataka and it is grown in 4000 ha in Davanagere district (Anonymous, 2016). Weed management assumes

primary importance in arecanut plantations because of smooth harvest of nuts. The application of post emergent weedicides will have adverse affect on the soil condition in long run. Intercultivation happens to be difficult proposition because of monsoon rain. Mr. B.R. Basavaraj, from Shamanur village in Davanagere block developed power operated weed cutter. The device consists of powerful light weight motor which runs at 10000 rpm. The device uses 1 unit of electricity for every hour of operation which is cost effective compared to petrol operated device which requires one liter of petrol for every one hour operation. The device is electrical shock free as it was made up of fibrous material. A speed controller unit was attached in the device and farmer can operate at desired speed-level. It was fitted with 100 feet cable wire and different kinds of steel blades to remove small weeds. The device has grinding facility to sharpen agriculture implements. The farmer is selling this device at Rs. 9000/- per unit. The device can also be used in coconut and other crops for weed control. More than 50 farmers adopted this technology.

Conclusion:

Farmer innovations are generally environment friendly and easily adoptable. These innovations are used locally available resources and solve many felt needs of farmers. These innovations are needed to validate by concerned institutions for wider adoptability and recognitions and registration of innovations for innovators is the need of the hour. Efforts need to be made that innovations can be remunerative and farmers property and entrepreneurship should be developed. Extension agencies can take up these innovations to solve field level problems.

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