Intercropping of fruit crops in Coconut garden – Vignettes from 'Chowtara thota' Meeyapadavu

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'Chowtara thota' ('Chowta's Farm' in Kannada language) is a field school for the farmers of Meenja village in Kasaragod district in Kerala state and nearby areas to visit and get exposure on modern farming practices. The farm is headed by Dr. D. Chandrasekhar Chowta who was once teaching in a university.

Dr. Chowta has no regrets in his decision to leave the promising academic job and switching over to farming as his profession. He is now 77 years old and he entered farming in 1978 at the age of 35 years. Prior to that he was engaged in teaching post graduate students and doing research in Cytogenetics and Radiation Biology in University of Bombay in the beginning and subsequently at University of Mysore (presently Mangalore University) for about ten years.

In 1978 he came back to Meenja, a remote village in Kasaragod district, his native place and got involved in the farming activities of Chowta family. His father, late Sri. Narayana Chowta was the Patel (village head having revenue authority of the village during the British regime) of the village and it was a joint family. The Chowta family was following traditional farming practices in their farm land revolving around paddy as the main crop. Chowtas still pursues the joint family system and Dr. Chowta lives with his two brothers and one sister. His older brother late Dr. D.K. Chowta was the head of the family who supported Dr. Chowta in the expansion and development of the farm. All the members of the Chowta family are

actively involved in the management of farm.

After taking over the farming activities, he introduced lot of changes in the crops, enterprises and agro-techniques in the farm. His approach to farming is very systematic and effective utilisation of scientific and improved farming techniques has been the key in the decision making related to development of their farm; be it the choice of crops, cropping/farming systems adopted, crop management practices followed, natural resource management and resource recycling or marketing strategies. And the result is there to see in the 'Chowtara thota'.

Chowta's farm is a rich showpiece of agro-biodiversity spread in about 50 acres. Apart from coconut, Chowta's farm comprises other crops like paddy, arecanut, cocoa, rubber, nutmeg, pepper, jack, and various fruits and vegetables. Paddy is cultivated in two acres near the banks of a small river flowing near his farm. It is not cultivated on a commercial scale but mainly aimed to meet the domestic requirement. Banana and pepper are grown mostly as intercrops in coconut garden. Of late, various exotic fruit crops like rambutan, mangosteen and avocado have been introduced in Chowta's farm as intercrops along with coconut and arecanut palms and also as pure crops.

Cocoa is raised as mixed crop in his five acre arecanut garden. His arecanut garden has all the important varieties released by ICAR-CPCRI; Mangala, Sumangala, Sreemangala and Mohitnagar apart from the south Canara Local or Kasaragod Local. The arecanut based cropping system in Chowta's farm was selected as a demonstration plot by the CPCRI Regional Station Vittal. Vanilla was also raised during the period from 2005 to 2010 as a mixed crop in the arecanut garden in two acres which was subsequently removed after the boom period due to the price crash.

Many farmers and extension personnel from Kasaragod district and other parts of Kerala and Karnataka state regularly visit Chowta's farm to get exposure to the innovative farming practices. Dr. Chowta and his family happily receive the visitors and are very keen to interact with them on the farm activities.

Coconut in 'Chowtara thota'

Chowta's farm has about 2200 coconut palms comprising of different varieties. About 1200 trees are of West Coast Tall variety. 500 trees are of dwarf varieties like Chowghat Orange Dwarf, Gangabondam, Malayan Yellow Dwarf and Malayan Orange Dwarf. The farm also has 400 trees of hybrid coconut mainly Chandrasankara and Kerasankara. Dr. Chowta gratefully acknowledges the support he received from Dr. K. U. K. Nampoothiri, former Director of CPCRI for introducing different coconut varieties in his farm. He also had fruitful association with Coconut Development Board for expanding coconut farming in Chowta's farm. CDB supported him under the Nucleus Seed Garden scheme.

WCT palms are about 55 years old while hybrids and dwarfs are about 25 years old. Besides, eight years back in 2013 Dr. Chowta has also planted 400 coconut seedlings of different hybrid and dwarf varieties which are mixed cropped with Rambutan fruit plants. Since Dr. Chowta adopts scientific crop management practices especially integrated nutrient management, irrigation and water management, coconut palms in his farm has high productivity. On an average the WCT trees yield 100 nuts, dwarfs about 100-125 nuts and hybrids about 125 to 150 nuts per palm per year.

Tender coconut marketing

A very unique feature of coconut farming in Chowta's farm is that about 80 per cent of coconut yield is harvested for marketing as tender coconuts. For the last 20 years Chowta's farm is selling tender coconuts mostly at Meeyapadavu, the nearby small town in his village. When the coconut price was low they were able to get higher price for tender nuts sold. Presently they are able to sell tender coconuts for Rs 30 per nut and tender nuts of COD, MYD and MOD varieties are sold for Rs. 32 per nut. Of late, though there has been a favourable price trend in the market for mature coconuts the highest rate for mature coconuts he received in the recent times was

only Rs 41.5 per kg which is not attractive compared to the price received for tender coconuts. According to Dr. Chowta the market rate for tender coconut is always attractive compared to mature nuts. He feels that there is an increasing trend in tender coconut consumption even in rural areas and coconut growers are to be made aware about the need to utilize the marketing opportunities in tender coconut sector which would essentially fetch them more income. Lack of availability of skilled palm climbers for harvesting tender coconuts would be a major constraint experienced by the growers which needs to be addressed by effectively utilising the service of rural youths trained under the Friends of Coconut Tree programme implemented by CDB.

Introduction of fruit crops

For many seasons banana was cultivated on a commercial scale in Chowta's farm. Banana varieties like Cavendish were raised as intercrops along with coconut and arecanut palms. Of late, intensity of banana intercropping has come down in his farm mainly due to the shifting focus to new fruit crops.

Later Dr. Chowta took interest in growing papaya and initiated a commercial papaya cultivation unit in the year 2005 with 125 plants of Taiwan Red Lady variety. There was no problem in marketing of papaya and it was a very remunerative enterprise and he was able to sell about half a tonne papaya every week. Papaya cultivation was continued for about 10 years.

Inspired by Mr. Sree Padre, well known farm journalist popularly referred to as 'Water Man' due to his efforts for popularising water conservation, Dr. Chowta turned his attention to jack fruit. He made efforts to have a diverse collection of local and exotic jack varieties in his farm. Apart from local varieties, the collection includes Taiwan Red, Early Vietnam, J-33 (Malaysian variety), Siddu and Shankara (Farmers' varieties of Jackfruit identified and promoted by ICAR-IIHR, Bengaluru). Traditional soft carpel jack varieties are also part of the collection. Dr. Chowta organised various programmes in his village to popularise production and marketing of value added products of jack fruit. Jack festivals were conducted many times at Meeyapadavu. Dr. Chowta invited chefs of the Taj group of Luxury Hotels to participate in the jack festival organised by Chowtara thota in collaboration with the Sarosa Institute of Hotel Management of NITTE University for the deliberations on jackfruit delicacies. Subsequently Dr. Chowta shifted his focus to introduction of different exotic fruit crops.

Experience of raising exotic fruits as mixed crops in coconut garden

▶ *Rambutan*

The first exotic crop thus introduced in Chowta's Farm was rambutan. He was motivated to take up rambutan cultivation by Mr. Jacob Francis who is having fruit plantations in different localities in Kerala and Karnataka. Dr. Chowta started rambutan cultivation in the year 2013 by planting 400 plants along with coconut in five acres. In the same year 100 rambutan plants were also introduced in the existing coconut gardens with grown up palms. In 2016-17 another batch of 500 rambutan plants were raised by removing the rubber trees. Altogether there are about 1000 rambutan plants in Chowta's Farm spread in nine acres of land partly as mixed

crop with coconut and remaining as pure crop.

Since it was his pioneering efforts to introduce rambutan as a mixed crop in coconut orchard there were none among the coconut growers in the locality to discuss or consult about the crop management practices to be followed. Thus he mainly consulted Mr Jacob Francis, the planter.

Varieties: N-18 and Ron Grein are the two varieties of rambutan in Chowta's Farm. The planting materials (grafts) of these varieties were procured from a private nursery (Homegrown Bio-tech, Kanjirappally).

Manuring: Dr. Chowta follows integrated nutrient management practices for rambutan. Every year an adult rambutan plant is given 4-5 kg poultry manure or FYM, 1 kg bone meal, 2 kg neem cake and 2 kg Geogreen (a commercially available branded organic manure). Chemical fertilizers are given in three splits; at the beginning of south west monsoon during May-June, post-monsoon during August September and the third split during the fruit setting time. 150 g Urea, 200 g Rajphos and 350 g Muriate of Potash are applied per plant. According to Dr. Chowta lime need not be applied since the rambutan plant prefers a pH range of 5-7. However, to avoid calcium deficiency calcium nitrate is applied in the soil or sprayed on the foliage. Similarly, magnesium sulphate is applied for ensuring the required amount of magnesium to the plants. Need based application of borax and zinc sulphate is done to correct deficiency of micronutrients; boron and zinc respectively.

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Pruning: Rambutan will grow as a big tree if its growth is unrestricted. Pruning is done to restrict the height of the plant to 10 feet to facilitate easy harvesting and cultural operations. Light pruning is done regularly after the harvest in every season by lopping the fruit bearing branches.

Plant protection: No serious incidence of pests and diseases is observed for the rambutan plants. However, if there is rain or dew fall during flowering season the flowers are to be protected by spraying wettable sulphur @ 2.5g/litre water.

Yield: Rambutan starts flowering about two years after planting and commercial yield can be obtained three years after planting; sometimes even two years after planting. From five years onwards stabilised high yield level can be expected. Normally the flowering season of rambutan is from December to April and fruits become ready for harvest during the period from April to September. Harvesting is either done as whole bunch or as individual loose fruits as per the market demand. It is better to harvest before 8 am to improve keeping quality of fruits. If delayed colour of fruits will fade. In Chowta's Farm yield obtained from rambutan, on an average, is 50 kg fruits per tree.

Marketing : Dr. Chowta has not experienced any difficulty so far in marketing of rambutan. Wholesale traders come to Chowta's Farm and purchase the fruits. Rambutan fruits from Chowta's farm is sold in the markets in Kerala, Karnataka and Tamil Nadu.

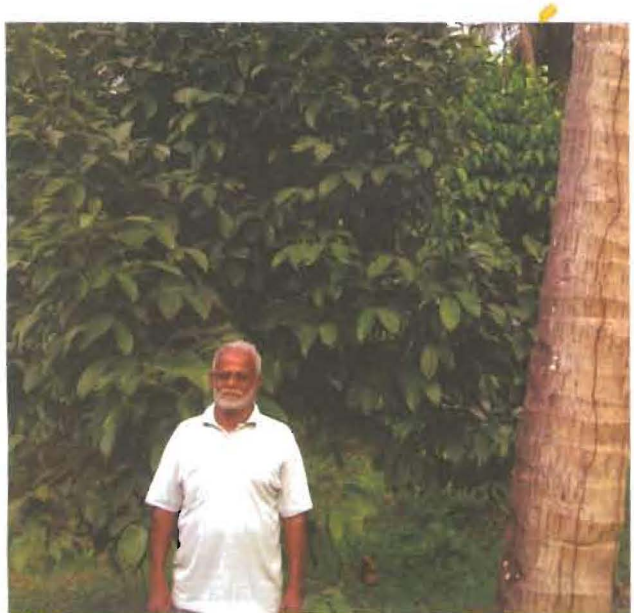
During the last season they could sell rambutan fruits at Rs 200 per kg.

Other exotic fruits

Based on the successful experience of raising rambutan, other exotic fruits like mangosteen, avocado and dragon fruits were also subsequently introduced in Chowta's Farm.

▶ *Mangosteen (Garcinia mangostana)*

Mangosteen is a tropical evergreen tree with edible fruit native to island nations of Southeast Asia and Thailand. Dr. Chowta has planted about 200 mangosteen in his farm; 100 nos planted in 2014 and the remaining 100 panted in 2016. Out of these, 75 mangosteen are planted as mixed crop along with coconut palms, 45 as mixed crop along with areca palms and remaining 80 as mono crop.



▶ *Avocado (Persea americana)*

Avocado is a fruit tree native to Mexico and Central America. This exotic fruit crop has been integrated in Chowta's Farm on a commercial scale. In 2017 about 100 plants of avocado were introduced in the existing coconut garden (40 nos along with 18 years old coconut palms and 60 nos along with 3 years old coconut palms). Again two years ago another batch of 500 avocado saplings were planted as monocrop in the laterite quarry in the farm after putting sufficient quantity of soil and applying lot of organics. Though few avocado trees were there earlier in the Chowta's farm they were raised only for house consumption. In earlier times, avocado cultivation in India was mostly confined to the tea and coffee estates. Since there was not much information about the potential of growing avocado in the agro-climatic situation prevailing in his village which represents the northern laterite tract. Dr. Chowta took lot of efforts to gather information about the cultivation of avocado and its suitable varieties. There was nobody to guide him on cultivation of avocado. There were mistakes made especially in choosing varieties and procuring planting material. His visit to Hawai island gave him exposure to the avocado cultivation.

Dr. Chowta is highly optimistic about the avocado crop in the farm which he hopes would add substantial income to Chowta's Farm.

▶ *Dragon Fruit (Selenicereus undatus)*

The latest addition to the exotic fruit crops in Chowta's Farm is dragon fruit. It is a species of Cactaceae and is the most cultivated species in the genus. It is used both as an ornamental vine and as a fruit crop. In 2019 about 20 units of dragon fruit plants were planted with granite stones as support. Dr. Chowta feels that dragon fruit, which is a hardy crop, would be quite suitable for planting as mixed crop in coconut gardens located in the laterite tract with low water availability.

Research and extension support needed

According to Dr. Chowta, coconut growers need support from research institutions like CPCRI for taking up cultivation of exotic fruit plants as mixed crops in coconut orchards. Technological recommendations pertaining to suitable varieties and crop management practices for raising these crops in the major coconut growing tracts in the country are to be evolved at the earliest and disseminated among the farmers. He has already presented this requirement before the scientists during one of the recently held interaction sessions at ICAR-CPCRI, Kasaragod. Dr. Chowta also feels that coconut development agencies should formulate and implement appropriate development/extension interventions to popularise intercropping of fruit crops in coconut gardens. This would strengthen the food and nutritional security and enhance income of coconut growers.

Recognitions/awards

Dr. Chowta has received many awards and recognitions for his outstanding achievements in farming. He got the 'Innovative Farmer Award' from

ICAR-Indian Agricultural Research Institute (IARI), New Delhi in the year 2010. He was one of the 100 coconut farmers selected from various states in India who were honoured during the centenary celebration of CPCRI in 2016. Dr. Chowta was selected by Department of Agriculture as one of the governing body members of ATMA Kasaragod. He also received the 'Alva's Nudisiri Prashasthi' award instituted by Alva's Sikshana Prathistana, Moodabidri in the year 2016 for his achievements in the field of agriculture. He was also included as a farmer representative in various committees constituted by different government departments and development organisations.

Reaching out to fellow farmers

Dr. Chowta and members of Chowta family have been very keen in sharing their farming experience with other farmers and providing guidance for scientific cultivation. Dr. Chowta was actively involved in organising FPOs of coconut growers in his village. 'Chowtara chavadi' was built by Chowta family at Meeyapadavu as a meeting place for farmers. It has building and infrastructure facilities for conducting training, seminars and meetings besides dormitory accommodation facility for the visiting farmers' groups. Various extension programmes including Krishimelas, exhibitions, training programmes and seminars are being regularly organised in 'Chowtara chavadi' in collaboration with different agencies to benefit farming community.

For more information about the farming activities of 'Chowtara thota' Dr. Chowta can be contacted in the following address.

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