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Timely recognition for Thejaswini

a model FPO for their farm and home activities

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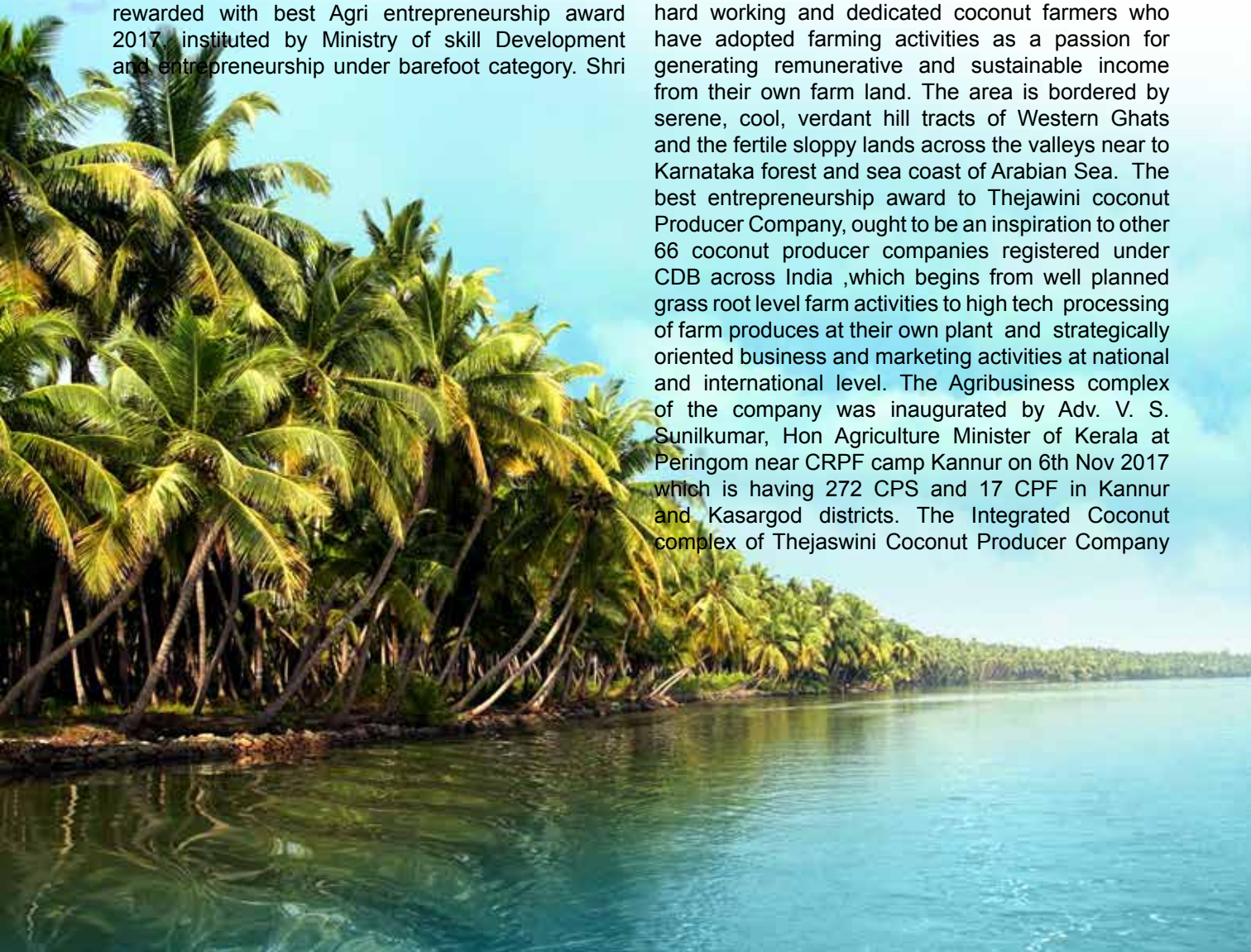
Introduction

The first farmer producer company registered under CDB formulated with a group of coconut farmers of Kannur and Kasargod districts in Kerala titled Thejaswini Coconut Producer Company is rewarded with best Agri entrepreneurship award 2017, instituted by Ministry of skill Development and entrepreneurship under barefoot category. Shri Sunny George, chairman of the company and then Karshakasree award winner had received cash award of Rs 5 lakhs, certificate and trophy from Shri. Arun Jaitly Hon Finance Minister on 9th November 2017. The Company is situated under the lap of Western Ghats which is blessed with a group of hard working and dedicated coconut farmers who have adopted farming activities as a passion for generating remunerative and sustainable income from their own farm land. The area is bordered by serene, cool, verdant hill tracts of Western Ghats and the fertile sloppy lands across the valleys near to Karnataka forest and sea coast of Arabian Sea. The best entrepreneurship award to Thejawini coconut Producer Company, ought to be an inspiration to other 66 coconut producer companies registered under CDB across India ,which begins from well planned grass root level farm activities to high tech processing of farm produces at their own plant and strategically oriented business and marketing activities at national and international level. The Agribusiness complex of the company was inaugurated by Adv. V. S. Sunilkumar, Hon Agriculture Minister of Kerala at Peringom near CRPF camp Kannur on 6th Nov 2017 which is having 272 CPS and 17 CPF in Kannur and Kasargod districts. The Integrated Coconut complex of Thejaswini Coconut Producer Company



Ltd is set up at Peringome Panchayath, 60 kms north-east of Kannur town opposite to Government PWD guest house and CRPF camp, Peringome with an investment of Rs.10 crores. At present, the company has collected equity shares worth of Rs. 164 lakhs from 347 allotted share holders and still issuing shares to individuals under CPS/ federations and CPSs as Institutional shareholder. Thejaswini Coconut Farmers Producer Company Ltd is implementing the central schemes of Government of India by adopting projects of CDB under Technology Mission on Coconut (TMOC), Schemes of NABARD, RKVY and SFAC and schemes of government of Kerala for promoting agri business activities of small and marginal farmers who are the shareholders of the company.

Thejaswini Company was registered under CDB in June 2013 with the intension to do group activities in coconut including production, procurement, processing and value addition for ensuring fair, reasonable and steady price for coconut and its value added products for improvising the standard of living of coconut farmers in Kannur and Kasaragod districts in Kerala. It is a collective of nearly 30000 coconut farmers who are venturing to produce and market coconut and its various value added products. As a first phase, the company has established an unit for the production of copra, coconut oil, soap unit, organic manure unit and biogas plant. The coconut oil manufacturing unit (with a capacity to process 25,000 coconuts per day), automatic machine for dehusking 1200 coconut per hour, bio manure production unit, Coconut oil based soap unit having production capacity of 5000 soaps per day are under operational stage in the Agro Processing Complex of the company.

The area surrounded by company is blessed with natural scenic beauty of evergreen hill stations, rivers, backwater, streams etc wherein company has adopted plantation tourism as part of responsible tourism project of Kerala State Tourism Department. They will launch the Responsible tourism project immediately with the objective of integrating products, services and local communities. Adventure tourism, ayurveda, arts and culture are involved in it. Home stay and farm stay facilities will be provided to the tourists. In this regard, cultivable area and hilly areas are being revived by the company.

Various projects of Thejaswini

Ten farmers from Cherupuzha in Kannur had formulated an eco farm society in 2010 was converted into Thejaswini Coconut Producer Company in 2013 under the Chairmanship of Sri. Sunny George Illamthuruthy. The company chairman and director board members are bringing out innovative ideas to make the activities of the company more successful and each member of Director Board is having specific responsibility for the progress of the company. At present Thejaswini produces Samridhi brand organic manure; palm fresh Neera, Thejas beauty soap, Thejas coconut oil, organic turmeric powder etc. Total number of 500 coconut farmers are engaged in organic farming. Shri.Sunny, Chairman Thejaswini informed that organic farmers need to get 50% additional income for each product when their farm products are manufactured organically. Shri.Joy Perumattikkunnel a share holder of the company has received state award for Best Organic Farmer in Kerala during last year. Besides company had bagged first price in business plan competition organized by CPCRI, Kasargode for FPOs in the

country. Thirumeni Federation of the company had bagged National Award of CDB for the best Coconut Producer Federation in the country.

By utilizing the share of coconut farmers, profit received from selling of samridhi organic manure and Rs.2 crore loan from NABARD, the building construction was carried out cost effectively. Contour terracing has been adopted for construction of the factory and reduces the cost of construction. Company expects more orders for Samridhi organic manure from ten Panchayaths of Kannur district. Besides, there is good demand for bio manure from the member farmers also.

NABARD has sanctioned Rs. 2 crores for the project of bio manure unit, nursery unit and copra drier unit. Varieties of coconut seedlings, seeds and plants of different fruits and vegetables, tuber crops etc are available in nursery titled Cherupuzha coconut nursery. In order to produce good quality coconut oil with the purpose of export, modern oil expeller unit is constructed with good quality alloy steel. There is a facility to transfer dehusked coconut to expeller unit from the defibering unit and coir pith to the bio organic manure unit through conveyer belts at a time. A vinegar unit is also established to utilize the coconut water which is presently being wasted in the unit. Expeller unit is having the capacity to process 800 kg copra per hour. The project cost of integrated coconut complex is Rs. 2.70 crores. A jack fruit processing unit is also planned in the integrated complex with the financial assistance of Khadi and Village Industries Commission (KVIC) where in jack fruit chips, pulp; sweets are available. 50% of diversified products will be recycled to the producers (Farmer groups) for consumption and local sale and 50% will be utilized for export purpose. They are planning to start virgin coconut oil, DC and coconut milk units as 2nd phase. The profit of the company can be increased to manifold if all parts of coconut are processed, value added and marketed. According to the company Chairman an integrated processing unit is essential to make more profits for a coconut based enterprise. Since its establishment this FPO has been actively supported by the Coconut Development Board under the guidance of Shri T. K. Jose IAS, then Chairman of CDB.

Cost effective construction of integrated complex.

Expeller unit

Skill Development Training

As part of Skill Development Training Programme of Coconut Development Board, Company has conducted 30 batches of FoCT and 5 batches of Neera Technician training programmes at its training centers. FoCTs are functioning as a labour force for carrying out main farm activities of company including harvesting and plant protection. Around 80 neera technicians have already been trained successfully under Neera technician training programme of CDB. They are tapping Neera with skill and expertise at different coconut plantations under the jurisdiction of the company. Nowadays company imparts training to interested farmers in the FPO itself after entering into an agreement with them that they shall be in the field for a minimum period of 2 years. Imparting training to farmers was also an inspiration to other companies while labourers from other state seems leaving during off season and not coming back for carrying out the job for next year. The model is being adopted by other FPOs during the current financial year. Progressive farmer Shri. Shaju Appachan is a model Neera technician of the company. He generates income equivalent to a class 1 officer in government department.

FoCT's involved in tender coconut harvesting and its sale

Neera tapping process

Eco – Farm Tourism

Eco farm tourism promotion attracts tourists from different destinations across the country and abroad for enjoying and experiencing the agriculture activities at farm level and for tasting delicious local cuisine prepared from organically grown vegetables and cereals. Company is planning to engage around 300 genuine and interested organic coconut farmers as part of eco farm tourism project. Such farmer groups will offer accommodation and food in the farm itself so that the guest can observe and involve in

Shri.Joy Perumattikkunnel rearing bees

farming activities. 100% organic food will be served to the guest. Accordingly tourists can experience real organic holidays at their farms. All these farms have been received organic certification from Indocert. Those who are having interest for trekking can visit Palavayal trekking and wellness centre, Tabor hills etc. Bamboo rafting in Thejaswini River is another attraction for tourists. Thejaswini River originates from Mundhari forest in Karnataka as a branch of Kaveri River. 'Tourism can be promoted effectively after the opening of Kannur airport' says Shri. Sunny George. All facilities including transportation from airport, railway station, accommodation, food etc will be made by tourism committee of the company. Irikkur, Thrikaripur, Thalipparambhu, Payyannur are the main eco spots of the company for promotion of responsible tourism project. Projects in this regard has been submitted to the state tourism department and the same is under implementation stage. The responsibility for promoting farm tourism is entrusted with Shri. Jose Urumbukkatil, one of the directors of the company. For promoting farm tourism company is planning to purchase 10 acre land at vegetative hill station in the locality wherein demonstration of special organic farms of fruits and vegetables, ayurveda, yoga, handicraft training etc will be arranged. Demonstration of Neera tapping, serving of Neera along with traditional cuisines etc will be arranged as part of tourism project.

As part of tourism promotion company has arranged visit to some specific tourist locations. One among them is the organic farm of Shri Joy Perumattikunnel. His areas of interest are growing pepper, arecanut, turmeric, cocoa, fruit trees, vegetables etc. This farm-home visit can provide firsthand information of how Mr.Joy maintains a sustainable food and agricultural farm with economical benefits. He is also specialized in honey bee rearing. After the visit people will get an idea of how the bees live in the hive, how honey is extracted, how a new hive is set etc.

Visit of foreign tourists

They have arranged trekking to Kottancheri. It is surrounded with dense forest. Kottancheri Hills is a home for many of the rare and endemic species found in the Western Ghat such as deer, wild pigs, wild elephants, wild dogs, rare birds, butterflies etc. Camping at Tabor Hills Tabor, the exclusive and integral constituent of Palavayal Trekking and Wellness Centre (PTWC) is an area of magnificent grassland, surrounded by valleys, embedded with beautiful hamlets and towns. Surely the hardworking nature and unity of the members of this barefoot enterprise had already beaten odd realities to attain higher rewards. ■

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Thejaswini coconut producer company.

'Ready to serve' Neera drink

Neera

A Salubrious Drink that Boost Human Health

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Coconut plays an important role in the national economy of India. Traditional areas of coconut cultivation are the states of Kerala, Karnataka, Tamil Nadu, Andhra Pradesh and also Goa, Orissa, West Bengal, Puducherry, Maharashtra and the island territories of Lakshadweep and Andaman and Nicobar. Millions of families in India depend on coconut for their livelihood either directly or indirectly. India ranks third in area and production of coconut in the world. The four southern states viz . Kerala, Tamil Nadu, Karnataka and Andhra Pradesh are the major coconut producing states in India accounting for more than 90 per cent of area and production. Coconut farming need to be nurtured by making it more profitable. This can be achieved through value addition by developing products of commercial value. Product development using coconut improves the livelihood of coconut farmers with small holding and also showcases India as a manufacturing hub for the food processing sector and promotes the Make in India concept of our Honourable Prime Minister Shri. Narendra Modi.

Neera – A Natural Health Drink

Neera is the sweet sap obtained by tapping unopened inflorescence/spadix of a coconut palm. It has high nutritive value and medicinal properties for making it as a natural health drink. It is possible to use coconut tree both for tapping and for nut production. The experience from countries like Philippines, Thailand, Indonesia etc. is that utilizing palms for neera production is much more profitable. Production of neera, a healthy drink is a highly profitable industry in many other coconut growing countries which is yet to be explored at a wide level in India.

"Production of neera, a healthy drink collected by tapping the unopened inflorescence is a highly profitable industry in many coconut growing countries which is yet to be explored at a wide level in India."

Nutritional Composition of Neera

Neera is a delicious health drink and a rich source of natural sugars, minerals and vitamins. It contains 16 kinds of amino acids and various vitamins such as vitamin C, vitamin B complex, especially nicotinic acid

(Vitamin B3) and minerals (potassium, magnesium, zinc and iron). Neera is highly nutritious than tender coconut water. Its Brix level is 16 [sugars] compared to 12 in sugarcane juice. Neera has a low glycemic index of 35 compared to cane sugar or sugarcane juice that has a glycemic index of 60.The nutrient content of neera is presented in the following table.

Vitamin and Mineral Content of Coconut Neera

VITAMIN	VALUE (mg/dl)	MINERAL	VALUE (mg/l)
Thiamine	77.00	Nitrogen	2,020.0
Riboflavin	12.00	Phosphorous	790.0
Pantothenic acid	38.40	Potassium	10,300.0
Niacin	40.60	Calcium	60.0
Biotin	0.17	Magnesium	290.0
Folic acid	0.24	Sodium	450.0
Inositol	127.70	Chlorine	4,700.0
Choline	9.00	Iron	21.9
Vitamin C	23.4	Zinc	21.2

Source: Indian Coconut Journal, 2013

Value Added Products from Neera

Neera can be processed into a number of value added products. The list of the products is as follows:

Palm Syrup is produced when fresh neera is heated and concentrated into syrup. In many countries, palm syrup is used as a health and wellness drink and is prevalently used in Ayurveda and other systems of medicine.

Palm wine is an alcoholic beverage created from the sap. Palm sap begins fermenting immediately after collection, due to natural yeasts in the pores of pot and air (often spurred by residual yeast left in the collecting container). Within two hours, fermentation yields an aromatic wine of up to 4% alcohol content, mildly intoxicating and sweet. The wine may be allowed to ferment longer, up to a day, to yield a stronger, more sour and acidic taste.

Palm Jaggery is prepared from neera, which is converted into a solid or a semisolid crystalline mass ready for direct consumption called palm jaggery. It has got wide use as sweetening agent in Indian village food products. Traditionally, palm jaggery is made by boiling raw palm sap in large, shallow, round bottom vessels. The raw juice is heated, as boiling proceeds, the froth and foam coming up to the surface is removed. The juice is stirred at intervals to facilitate mixing and rapid evaporation. When the juice thickens, the fire is controlled in order to prevent it from caramelizing. Correct strike temperature is judged by patting a small quantity of the thickened mass in water and rolling it into ball shape. If ball forms into a hard one, the mass is moulded into moulds. In order to facilitate easy removal of the blocks from the moulds, the moulds are either moistened with water or besmeared with fresh sweet oil before filling.

Liquid Palm Jaggery is in liquid form or semi-solid form. It is very fine and chemical free liquid syrup.

Palm Honey is produced from neera, which is heated in an open vessel to 78° Brix level. It is thick liquid syrup like honey. It is used as table syrup as a sweetener in confectionary items like ice creams. It is a rich source of iron for anaemic patients and hence it is mainly used in pharmaceuticals formulation.

Palm Sugar or crystalline sugar is made from neera. The initial process of sugar making is same as that of jaggery. When the cooking mass thickens, it is removed from fire and mixed with steel server heavily, when the temperature decreases the mass gets converted to crystalline sugar.

Palm Candy has its importance among the products of neera. It has got its various uses in ayurvedic medicinal preparations.

Molasse's is a sweet syrup obtained as a by-product of palm sugar. Bio-chemical products like ethyl alcohol, acetic acid, citric acid etc., can be prepared out of molasses by fermentation methods.

Palm Vinegar can be produced from the inflorescence sap other than from matured coconut water. Fresh sap is poured in a wide large plastic

container with clean netted cover to allow aeration and prevent entry of dirt and foreign objects. After about ten day's fermentation in well ventilated room, the sap can be harvested as vinegar. Vinegar has extensive use as preservative in pickle industry and flavouring agent in food processing sector. The palm vinegar has good export potential as compared to synthetic vinegar.

Health Benefits of Neera

A recent study conducted by the Indian Institute of Science, Bangalore shows that neera can help cure liver diseases. The study proves that neera is particularly useful in treating liver diseases following consumption of alcohol. The magical property of neera to remove "acetaldehyde" (the toxic metabolic product of ethanol causing liver damage) was proven in the study. It has also been shown to boost the activity of a normally functioning liver.

Neera is safe and perhaps the best health drink for persons suffering from diabetes. This is because of it's low glycemic index (GI). Neera do not increase the blood sugar level above glycemic index 50 within two hours of consumption. The use of neera and it's by products gives the same sweetness without causing hike in blood sugar level compared to the traditional sweetening agents used in soft drinks.

The low GI of neera is due to the presence of inulin, a natural source of carbohydrate. Neera is helpful in preventing many lifestyle diseases like obesity, cardiovascular diseases and even cancers of the breast, colon, pancreas and prostate, bone and fatty liver etc. It has been studied for use in medical conditions like asthma, tuberculosis and urinary tract infections.

Neera is a nutritious drink that is amazingly rich in vitamins and minerals. It contains a good amount of minerals. Neera helps to keep the body hydrated, while the nutrients in it nourishes body and keeps energetic and refreshed. Neera can be given as a natural supplement in conditions like iron deficiency, anaemia and zinc deficiency.

Neera is a rich source of Vitamins. The anti-oxidant property of these vitamins and the neutral pH makes neera a natural detoxifying health drink. Apart from the minerals and vitamins, the sweet drink is rich in glutamic acid (amino acid) which is necessary for protein synthesis. It is widely used during post operative

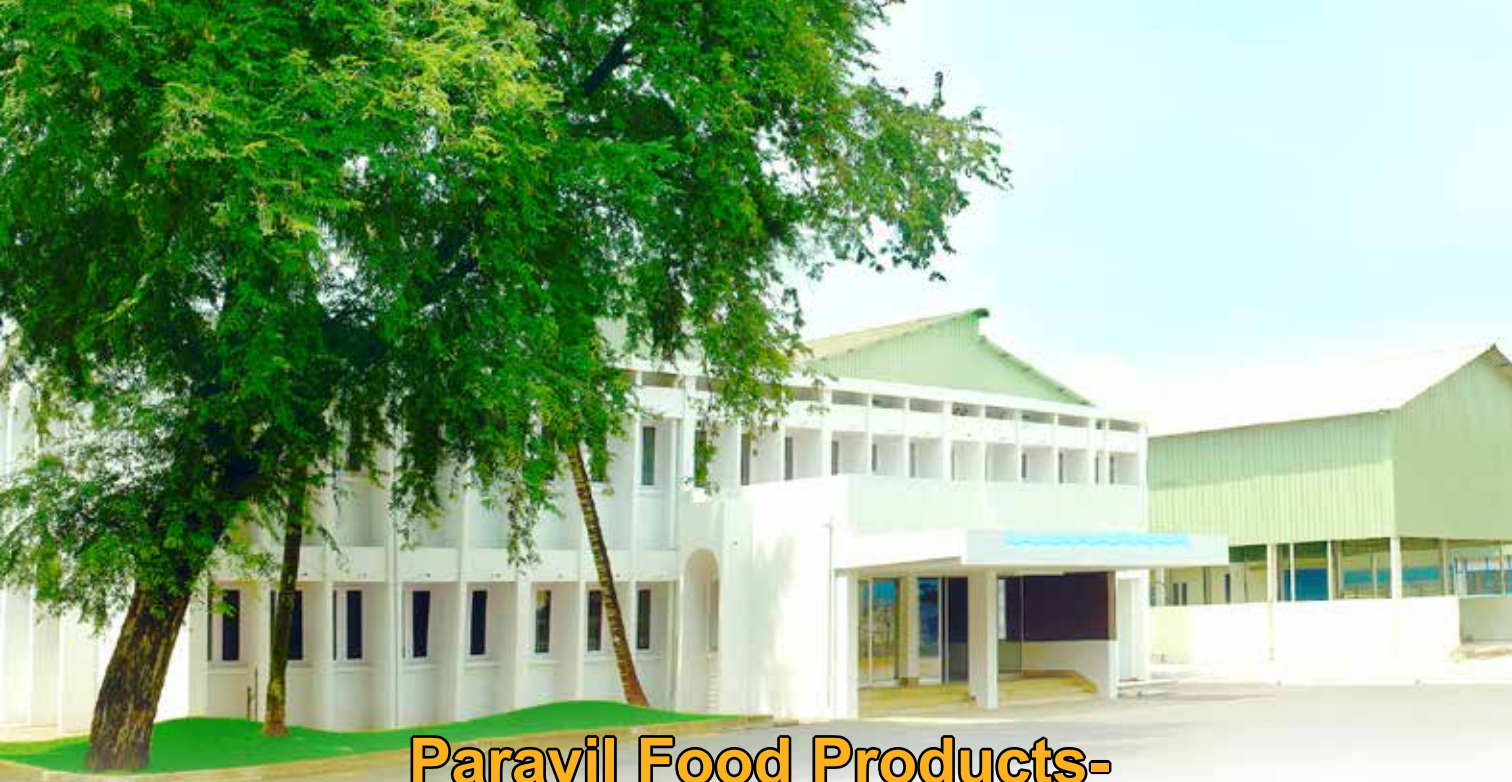
care. It has high content of electrolytes and can be used to treat diarrhoea and dysentery for the replacement of electrolytes. It also facilitates clear urination and prevents jaundice.

Hypertension is a common problem affecting billions of people all over the world. It is also an important risk factor for health problems like stroke, kidney damage and cardiovascular diseases. Studies indicate that coconut neera is effective in managing hypertension and associated complications without causing any side effects.

According to various clinical studies, neera has applications for various health conditions including asthma, anemia, bronchial suffocation, tuberculosis, and piles. It is high in inositol, a naturally occurring nutrient, which is beneficial for the treatment of eczema, eye abnormalities, etc. It is also associated with the regulation of enzyme activity, nerve transmission and transportation of fats within the body.

Conclusion

The real growth of India relies on the growth of agriculture sector. To sustain the coconut farming, more value added products from coconut has to be produced. Neera from coconut is a nature's nutritious sweet drink having numerous health benefits. Neera can be promoted as nutritious health drink and also as sports drink, as it possesses naturally high sugar and electrolytes. Neera tapping would definitely help farmers for adequate economy to upgrade their livelihood from coconut farming. ■



Parayil Food Products-
25 years of Delicious Delights

Abe Jacob
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It is a quarter century since the Delicious Delights of the central Travancore are sent to the kitchens across the continents of Europe, America and Australia. It was quite accidentally that late Mr. P J Mathew of Parayil house from Pala, Kerala became an entrepreneur and then an exporter. Now after a quarter century the Delicious Delights of Parayil Food Products is a common item in the dining table of many malayees across America, England, Ireland, Germany and Switzerland.

Mr. Mathew basically , an agriculturist by tradition and associated with the rubber plantation and the hospitality business took on the challenge to process and freeze porottas and other bread items to a quality conscious international market. It was during one of his trips to America that he realized the preference of non resident Indians for their native foods. Parayil Exports, the family run business, implements quality, stands by consistency and reliability and uses it as a yardstick to success. A processor and exporter of a multitude of ready to eat processed food packed under its flagship brand Daily Delight, the unit is located at Nariyangannam village of Kottayam Dt., Kerala.

Parayil initially started with spices and curry powder as a small business firm in the year 1993. Later on when the demand for products started growing, the company started the export of curry powder, pickle and chips. It was in the second phase that the company started producing and exporting frozen food items. Almost all the favourite items of Keralites particularly breakfast items, curries etc are brought to the customer in the ready to eat form. This initiative of Mr. Mathew was in fact the first of its kind which nobody else had tried earlier. The items are prepared and are frozen at -40^0C and is stored at -20^0C. The product is exported in the same temperature. It will take around one month for the product to reach the consumer. These products available in super markets can be kept in the refrigerator until usage. Along with breakfast items, Parayil Food Products is also exporting various snack items.

Reliability in taste, consistency in flavor and the good quality of the products keep customers requesting for more products resulting in setting up of an R & D unit and adding on many more products to the prepared food line. Ready to cook food products were the next in line products from Parayil. Sambar and aviyal mix and other ready to cook curry mix, seafood in raw and clean form and also in ready to cook and cooked form are exported from Parayil's unit in Aroor, Kerala. These seafood products have a shelf life of two years.

Parayil is also into coconut product exports.

Nearly 20 tonne coconut is being exported to different destinations across the globe. Coconut, coconut milk and coconut oil is added in right quantity in all the food items which are being exported by Parayil. Around 500 types of products are exported daily. Parayil Food products is procuring coconut from Quilon, Calicut and Palakkad districts in Kerala and also from Tamil Nadu. The company is very strict on the quality of the nuts that they are procuring. Scrapped coconut is packed and frozen at -40^0 C for export. A good quality lab is also running as part of Parayil Food Products which strictly ensures the quality of the products. Apart from coconut, coconut oil in one liter and half liter bottle and packets are exported by Parayil. Around 400 people each are working in a shift in both the units of Parayil Food Products at Aroor and Nariyanganam.

Parayil is planning to extend its activities to Tamilnadu also. A unit is in the pipeline in Pollachi which is expected to start functioning in 2019. Company is planning the production of desiccated coconut, coconut milk and coconut cream from this unit.

The prepared food facility has been designed keeping in mind not only USDA and EU standards of operation but also traditional processes of cooking that lends the product the very essence of home made authentic taste and flavor. The plant integrates all aspects of production under one roof right from pre-processing to processing, quality control and storage. The plant operates under a HACCP and follows GMP at all points, is FDA approved to export to USA and an ISO 9001-2000 certified company. A full fledged laboratory manned by qualified experts work round the clock to ensure that consistent quality products are reached to the consumer.The Research and Development team puts together more and more traditional items onto the plate hitherto not made at home often. This keeps Parayil traditional cuisine alive in the lives of the young generation.

Daily Delight with its wide range of ready-to-eat food and frozen cleaned and cut vegetables continues its mission of expanding its line of product. More ethnically diverse products are brought to the consumers around the world, evoking nostalgia about one's roots, one's homeland and its food. Through its wide range of Indian ethnic food products, Parayil's brands have been able to reach out to consumers across the globe who keep asking for more.

The vision set by it's founder Late Mr. P.J. Mathew continues to be promoted through his sons who have also been at the helm of the family business since its inception. Mr Joseph Parayil, Mr Philip Parayil and Mr Mathew Parayil, the Directors of the company believe in keeping in touch with day-to-day operations, no matter where they are. Though based in India and USA, they make it a point to visit the plants frequently and interact with all departments and keep the bond strong. Their presence strengthens the commitment of the entire team making the vision of the group a success. ■

Collective effort to count more from coconut

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Coconut is a crop that can be utilized for a wide variety of usage from medicine to cosmetic; food to nutrition and from shelter to protection of natural resources. The count is infinite. The raw material required is a healthy high yielding coconut palm. The plant attains the status of a crop when it is cultivated on large scale by providing adequate quantities of inputs at appropriate times.

Nowadays the coconut farmers are striving hard for getting good yield in the light of climatic vagaries, high incidence of pests and diseases, lack of agricultural labour especially for harvesting coconuts and neera and other plant protection operations, unstable market prices, etc. Though these obstacles can be tackled to a certain extent with the available technologies and information with proper management, the anticipated impact could not be obtained in terms of reflection in the sustainable income from coconut farming. One of the main reasons is the lack of collective action at field level towards pest and disease management, scheduled harvesting, aggregation of farm produce, identification of proper profitable market, value addition, byproduct utilization, etc.

Collective action in the real sense is collective labour. It is natural for different kinds of people to have different types of thinking. Agriculture especially coconut cultivation if taken up in a collective manner can realize better yields and better income through varied activities, which cannot be taken up by individuals. The individual members will be motivated to perform well if their effort will lead to obtaining a valued goal which in turn result in valued group outcome and in a valued individual outcome. The collective labour improves the knowledge of the participants on the action they carryout and shares the burdens of other individuals.

The Coconut Development Board (CDB) under the aegis of the Ministry of Agriculture and Farmers Welfare, Government of India encourages the coconut farmers to form farmers' collectives and facilitates formation of three tier Farmer Producers' Organisations (FPOs) in coconut sector viz., Coconut Producer Societies (CPSs), Federation of Coconut Producers Federations (CPFs) and Coconut Producer Companies. The main objective of formation of FPOs in coconut sector is the socio economic development of coconut farmers through productivity improvement, cost reduction, efficient aggregation, processing for value addition, better by-product utilization and efficient marketing of the produce. About 40-100 coconut growers in a contiguous area with a consolidated minimum of 4000-6000 palms can form CPS. 15-25 such CPSs by aggregation can form a CPF having 1,00,000 bearing palms, and further to CPCs having 10 CPFs and 10,00,000 bearing palms. As on 31.10.2017, a total of 9473 CPSs and 733CPFs have been formed and registered with the Board in different States. 67 CPCs have been established by FPOs. They involve in nursery raising, aggregation of producers, marketing, processing for value addition in coconut for virgin coconut oil, coconut oil, coconut hair cream, coconut milk, Neera and Neera based products, etc.

The efforts of CDB in formation of FPOs in coconut sector has initiated transformational effort by adding value to the coconut farmers by empowering them to become a vibrant self sustaining and prosperous agricultural community. These FPOs due to the higher access to the government and other organizations can disseminate and share the knowledge gained and adopt the technologies in coconut sector for the

immediate benefit of the members. They can help in mass adoption of Integrated Pest Management (IPM), Integrated Nutrient Management (INM) and integration of coconut based farming system. The FPOs are also expected to collaborate with technical and financial institutes, research institutes, management institutes and other consultancies for acquiring the expertise required to move in the right direction during their initial stage. They can also impart training to the youth for making available enough technicians for Neera tapping, plant protection activities, etc.

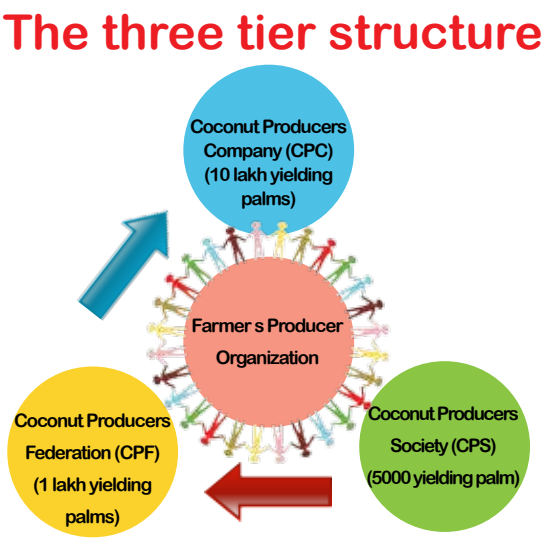
With the formation of more collectives of coconut farmers several benefits are expected to arise out of which a few are listed below.

Increased coconut production is envisaged by dissemination and adoption of scientific management practices including timely and adequate application of irrigation, nutrient and plant protection measures. The water conservation technologies and adoption of suitable irrigation system will increase the production. The information on financial assistance/ credit facilities for different components under different schemes of the State/ Central Governments for fertilizers, seeds/ planting materials or pesticides, investment for a water source or improved irrigation systems or farm mechanization benefits increased production. Increased production yields increased income to the farmer. Increased income will attract more investments in the venture either by way of expansion of area of cultivation under coconut or for improvement in current production technologies being adopted. This will again increase the production.

Increased production and income will also lead to better management by the farmer which will improve the quality of coconut viz., size, shape, volume of water, oil content, TSS of tender coconut water, nuts free from deformities due to pests, diseases and other nutritional disorders, which will fetch higher price.

As coconut and few compatible intercrops like dried cocoa beans, nutmeg, other spices, grams, etc. can be stored for a longer time, storage yards may also develop as part of improved market facilities that allow the products to be sold at a time when prices are more favorable. Further, this also will attract more FPOs to band together to build storage facilities or for aggregation of farm produces, or for improved market infrastructure.

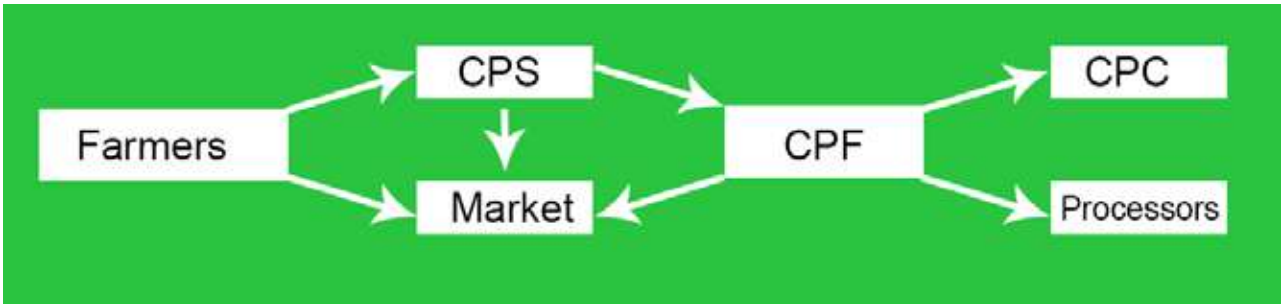
The increased nut production will lead to increased marketing activities and improved infrastructure in roads and logistics. This will in turn help the farmer producers and the manufacturers to transport and



sell the products at a location where higher returns are expected, thus a change in locational value of coconut is expected out of the proactive functioning of these FPOs.

Increased production leads to increased market surplus which can pave way for flourishing coconut processing industries through value addition. Thus brings a change in the form of coconut being sold from raw coconut to copra, coconut oil, VCO, milk, cream, honey, shell related products, etc.. As the technology dissemination among coconut farmers from their FPOs would enable the farmers to venture to value addition, which may fetch them higher prices than in the benefits in change in time of sale or change in location of sale. Even a simple processing facility such as a grading shed or dehusker adds benefit through changing the form of the coconut as a produce to sorted nut or a primary level processed nut. The better ones can be sold at higher price for direct consumption where the size matters and inferior ones can be diverted for processing industries, where the composition like oil content matters. In this process, the total value of the coconuts is increased.

Cost reduction in coconut cultivation can be achieved by investment in agricultural machinery to reduce labor costs, which is a major part of the expenses. Installation of tubewells, drip irrigation system, use of mechanized ploughing equipments, mechanized harvesting devices, weed cutters, dehuskers, coconut leaf petiole threshers, etc. are some examples that coconut farmers can adopt on purchase of these machineries on a community



basis. This does not mean that the labour is saved but the labour thus saved can be productively involved for other activities, as the country is facing acute shortage of agricultural labours.

Increased production of coconut and intercrops in a particular region would pave way for better infrastructure like better feeder roads or highways which may reduce the cost of moving the produce from the farm to the consumer. This benefits the farmers, truckers and consumers as well.

The information on plant protection measures, post harvest storages, etc. that are to be disseminated among the farmer members of the FPOs would reduce the losses. This is achieved by improving the physical condition of the palms or reducing the death of palms due to red (palm) weevil/ bud rot which may be lethal, if timely actions are not taken. At the same time coconut production would also be increased. The replanting and rejuvenation programme being implemented by the Board, though may not substantially increase the production in a short span, will surely avoid the losses due to the old and senile palms. This will prevent loss of income to the farmers.

The current contribution of coconut in India's GDP is about Rs.2,50,000 million (US$ 3788 M) to the country's GDP. The increased coconut production at farm level as well as value addition taken up by the apex level Coconut Producers Companies coupled with the developmental activities of various departments of the Government would increase the coconut sector share in agriculture sector.

About Rs.43,654 million (US$ 661 M) is reported as the export revenue from coconut, coconut products including coir products during the year 2016-17. The extension of supply chain coupled with market information to be disseminated from the centre would enable enhanced levels of foreign trade, which may contribute to the exchequer.

Increased production/ area under cultivation and related activities will generate more jobs at various levels of production, processing and marketing. The skill levels of the people will be enhanced as required by the industry they are related to. The increased production/ job opportunities leads to better income for the stakeholders of which major part may be invested in better health care and education of their family members.

Improvement in farm management technologies will facilitate higher production, value addition, and improved logistics which allow settlement of people in aggregation apart from creation of new job opportunities. This will lead the concerned government institutions to provide additional facilities to the dwellers for better health as a result of more rural health centres, better nutrition, reduced incidence of waterborne disease as a result of improved rural water supplies, better education by construction of schools, etc.

Coconut is cultivated in a total area of 20.96 lakh ha in India. However the area coverage under the FPOs in coconut sector is too little. Thus the momentum of collective effort by formation of Coconut Producers' Societies, Federations and Companies is to be increased and the activities taken up by them are to be widened up with clear focus. At the same time there should be collective effort from CDB and other related institutions in the research, extension, marketing, infrastructure and rural development sectors for developing technologies for reduced cost of cultivation, market research on consumer acceptability, product basket for different domestic & global markets, techno economic feasibility studies for establishment of processing units for more valuable and convenient coconut products. It is also the need of the hour to make adequate provisions in the policies for handholding these FPOs in coconut sector for the sustainable income to the coconut farmers of the country and for a collective impact as a whole.■

Coconut Biotechnology: New Vistas

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The coconut palm (Cocos nucifera L.), eulogized as 'Kalpa Vriksha', is quite extraordinary for its use in the manufacture of various products and as a provider of direct livelihood for millions of people in the tropical coconut growing regions of the world, in addition to its contribution to environmental sustainability in these fragile ecosystems. Conventional coconut breeding is quite cumbersome given the perennial nature of the palm, its sizeable phenotypic diversity, low multiplication rate, highly heterozygous nature and lack of means for vegetative propagation. The use of biotechnological tools has permitted researchers to overcome some of these difficulties associated with conventional coconut breeding.

Embryo culture and embryo rescue

In coconut, production of planting material for propagation is exclusively through seed nuts. Some of the major limitations come across during collection, transport and storage of coconut germplasm as seed nuts include the bulkiness of the seed nut, its short dormancy period, presence of nut water, stringent phytosanitary requirements, increased risk of pests and diseases and huge cost for transportation. The

Fig. 1. Embryo rescue of sweet kernelled genotypes

collection and transportation of coconut germplasm through embryos, instead of seed nuts, is recommended by FAO/IPGRI. The coconut embryo culture protocol has been standardized in ICAR-CPCRI. This technique has enabled introduction of exotic germplasm (45 accessions from eight countries) into the country. The technique also finds use for embryo rescue in coconut with special traits like coconut with sweet kernel (Fig. 1), horned coconut and Makapuno type of coconut (which do not germinate naturally), for collection of rare germplasm, as well as for developing cryopreservation techniques utilizing coconut zygotic embryos.

Fig. 2. Normal plantlet growth after cryopreservation of coconut zygotic embryos

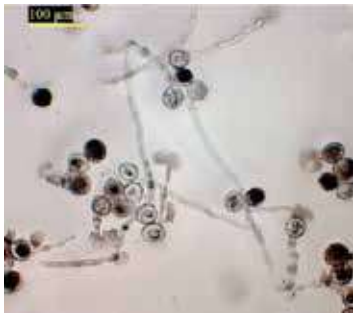

Fig. 3. Germination of cryopreserved coconut pollen

Cryopreservation for germplasm conservation

The prevalent mode of conservation of coconut genetic diversity is through establishment of field gene banks. A complementary conservation strategy has been envisaged for safe and effective conservation of entire gene pool of coconut. Cryopreservation of coconut zygotic embryos and pollen (Fig. 2 and 3) has been successfully employed at ICAR-CPCRI as an adjunct technique for long-term conservation of coconut germplasm, thereby shielding valuable genetic resources from biotic and abiotic threats. For pollen, its collection, processing and storage in liquid nitrogen have been assessed and found to be successful in terms of pollen viability and fecundity for long term storage upto a period of six years of study, which substantiates its efficacy in long term conservation. The successful preservation of somatic embryogenic cell cultures would facilitate the production of many more coconut plants from one initial explant.

In vitro culture for rapid multiplication

A major impediment to enhancement of coconut productivity is the production and distribution of homogeneous quality planting material to the farmers. The present annual production of coconut seedlings through conventional techniques is unable to meet the annual requirement of quality planting materials. Rapid multiplication of coconut through in vitro techniques, therefore, is of paramount importance. However, recalcitrance of coconut to in vitro culture is still a major bottleneck. Plumular regions are juvenile tissues which have responded best to in vitro culture. The in vitro regeneration protocol from plumular explants has been improvised using shoot meristematic tissues excised directly from the fresh embryo. Early callus induction and significantly greater embryogenic potential and subsequent plantlet development has been achieved (12 somatic embryos/plumular tissues on an average) (Fig. 4 and 5). Even though plantlets have been regenerated and successfully established in the field, a large

Fig. 4. Embryogenic callus obtained from plumular explants of coconut

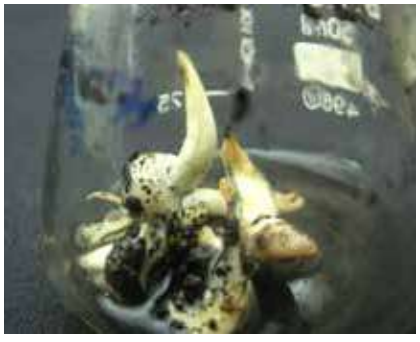

Fig. 5. Plantlets derived from somatic embryos

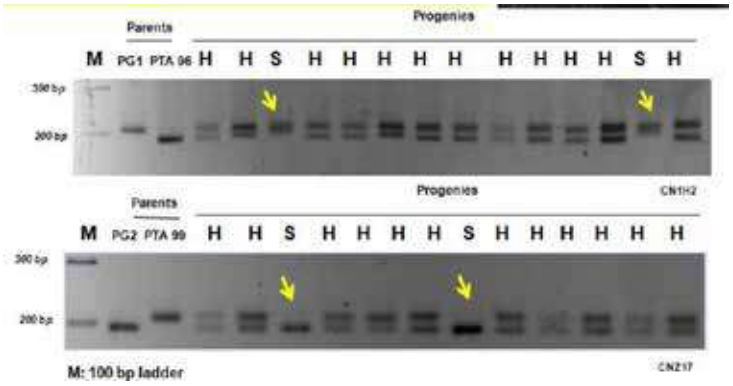

Fig. 6. Confirmation of coconut hybrids (CGD x WCT) using microsatellite markers (PG: CGD parent, PTA: WCT parent, H: Hybrids, S: Selfed progenies)

scale clonal propagation of coconut is yet to be accomplished with conversion of somatic embryos into plantlets remaining one of the major bottlenecks. It is necessary to consider and then employ procedures that are successfully used for other species to help drive future improvements in coconut in vitro culture.

Molecular markers for genetic diversity studies and marker-assisted selection

Molecular markers have the capacity to enhance breeding efficiency in coconut in distinct ways through germplasm characterization and management, linkage mapping and identification of quantitative trait loci (QTL) markers for marker-assisted selection (MAS). Origin of coconut palm had remained a puzzle for many years. Through molecular marker studies, evidences have been provided for two independent origins of coconut, in the Pacific and Indian Ocean basins. Studies, utilizing molecular markers, have revealed genetic distinctiveness of tall and dwarf coconut accessions, which can be attributed to the differences in their breeding behaviours: the self-pollinating dwarf coconut accessions display less phenotypic and genetic diversity and more homozygosity in contrast to talls, which are cross-pollinated.

Markers associated with important traits can increase the breeding efficiency, thus reducing the time for a breeding cycle in a perennial crop like coconut. Molecular markers have been identified for differentiating tall (T) and dwarf (D) cultivars of coconut. These markers have also been utilized for confirming the purity of D x T hybrids which will ensure supply of genuine hybrids to farmers (Fig. 6). Selected alleles of SSR or RAPD markers have been associated with resistance to eriophyid mite and lethal

yellowing disease which would allow for selection of these traits in the seedling stage itself. QTL mapping of important traits such as early flowering, yield, fruit components and composition of cuticular wax have been identified so far. Strong QTLs and saturation of coconut linkage map with an additional set of markers can increase the breeding efficiency of coconut for the traits of interest.

Conclusion

As can be envisaged from the above, biotechnological techniques offer enormous potential for development of new useful coconut varieties, with the available diverse germplasm, by overcoming impediments associated with traditional breeding techniques. Adoption of a combination of classical breeding methods with modern biotechnological techniques will lead to the rapid improvement in coconut breeding objectives. Improvement of biotechnological protocols and their applications to a repertoire of coconut germplasm will definitely open up new prospects for collection, conservation, breeding and productivity of coconut ■

Encouraging Outlook for the Coconut Industry

Uron Salum, Executive Director, APCC, Jakarta

Coconut oil from crushed copra is still the largest coconut commodity traded globally at nearly 12 million tonne annually and therefore continues to engage millions of rural families throughout the world in coconut production. Rotterdam prices rallied at US$1,549. As a result the good copra price enjoyed by farmers continues with Philippines and Indonesia farmers receiving US$872/MT and US$889/MT respectively. Despite slight fluctuations, most other coconut product prices would remain steady through this season.

Cost-effective production methods applied by farmers compliment income from viable intercropping as well as activities such as small livestock and possibly inland fisheries in some areas. Non-edible products of coconut are worth considering as integral to value addition initiatives. It concerns high value products that come from the husk, shell, leaf and stem which is normally not utilized and discarded therefore minimizes the economic potential of the crop in many countries. An example is the coconut shell which is used to make charcoal and activated carbon for which Indonesia, Philippines, India and Sri Lanka are major producers. Activated carbon market price range is between US$1,500 and 2,000/MT. Global customers import annually over 800,000 tonne of Activated Carbon to major destinations as in USA, Japan and China. Interest in revitalizing the coconut industry is gaining momentum in many of the APCC member countries. Kenya is purchasing hybrid coconut seed nuts out of India for trial planting. Jamaica revamped seed garden production to over 400,000 seed nuts per year. Philippines Coconut Authority announced plans to distribute 20 million coconut seedlings to farmers over 3 years. The level of output would be made possible with the release of coconut producer levy funds. Thailand and Malaysia who are in serious shortage of planting material are seeking many alternatives including mass production through micro propagation using tissue culture methods. This would be a similar approach to be taken by the larger coconut countries of India, Indonesia, Philippines, Sri Lanka and the Pacific countries. Mexico and Brazil are moving forward with commercial tissue culture activities to meet the demand for plant material. Coconut trees in the Pacific Island countries of Solomon Island, Fiji, Samoa and neighbouring islands are experiencing severe damages to coconut trees over large areas by the dreaded rhinocerous beetle pest.

Collaboration between countries as well the APCC and partner institutions to provide technical assistance focusing on managing such a high level of infestation. Innovations with new product lines is a constant target for processing facilities and companies. Franklin Baker Company in the Philippines is introducing new coconut water products. The Sambu Group in Indonesia has launched a new coconut milk product for drinking and to package fresh coconut water and without the need to add any sugar. Claims that Neera or coconut sap juice boost the immune system is stimulating higher production. With high content of Vitamin C, antioxidants and iron content, amongst other healthy attributes, Neera would be widely promoted aggressively to increase consumption. APCC looks forward to a new year in which to keep pursuing inclusive growth and sustainable development within and without the coconut sector.

Source: Cocommunity Vol. 47. No. 12. ■

Ecofriendly management of invasive Coconut Rugose spiralling whitefly in Tamil Nadu

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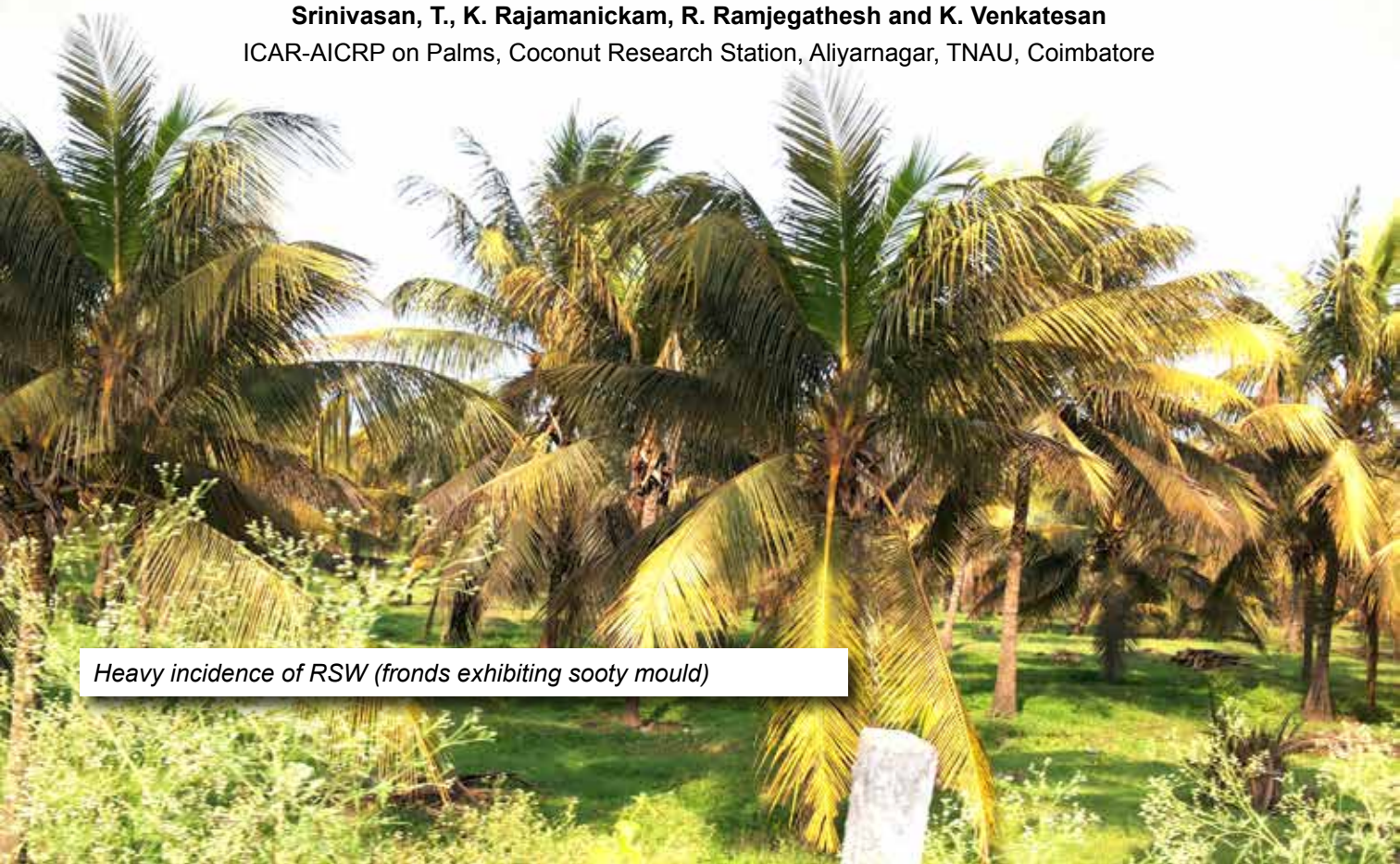
Invasive Rugose spiralling whitefly

Rugose spiralling whitefly (RSW), Aleurodicus rugioperculatus Martin is an invasive species of whitefly belonging to the family Aleyrodidae (Order: Hemiptera). It is widely referred to as gumbo limbo spiralling whitefly and was first reported in coconut (Cocos nucifera L.) during 2004 in Belize, Central America and in South Florida, United States in 2009. It was reported in Pollachi tract (10.491ºN; 76.980ºE), Coimbatore district, Tamil Nadu during August, 2016.

Females of the RSW lay creamy yellow coloured eggs on the under surface of the leaves in a spiral manner. The eggs upon hatching out into nymphs, develop by sucking the plant sap from the under surface of the leaves. Initially, the lowermost fronds are the ones which are colonized by the RSW adults. Persistent sucking by the RSW results in

> As an invasive pest, RSW poses a threat to coconut plantations in South India. Continuous surveillance, non-chemical approaches and conservation of the natural enemies are the need of the hour to contain the pest.



Heavy incidence of RSW (fronds exhibiting sooty mould)

Nymphs of RSW showing emergence holes made by the Encarsia parasitoid

Yellow sticky sheets on palm tree trunks

yellowish white patches on the adaxial surface of the leaves, which later coalesce to larger areas of yellowish discolouration. The adults excrete honey dew secretions that drips on the abaxial surface of the leaves as well as on the adaxial surface of the underlying fronds. Establishment of a fungus Capnodium takes place, wherever the honey dew secretions are present, exhibiting a charcoal black appearance which could be seen even from a longer distance. Initial feeding and honey dew excretion leads to sooty mold deposition on the lowermost 6-8 fronds. Under severe population build up, the whitefly population, tend to colonise even on the middle whorls leaving the central spindle leaves alone. Heavy honey dew dripping by RSW adults lead to the presence of the black sooty mould even on the underlying vegetation and grass cover.

Host range and varietal preference

The RSW has been known to attack about 118 hosts including cultivated crops and weed flora. Several host plats were found to harbor different life stages of RSW of which banana, bhendi, sapota, custard apple, citrus, nutmeg, hibiscus, guava, etc. supported the full life cycle of RSW viz., egg, nymph and adult. However, arecanut, mango, cassava, parthenium and pepper harboured only the egg stages of RSW which revealed that these hosts did not support the complete development of the invasive pest. Observation on the extent of damage in different varieties also revealed that dwarf varieties like Chowghat Orange Dwarf, Malayan Yellow Dwarf and Malayan Green Dwarf, and Dwarf x Tall hybrids suffered severe attack while low levels of infestation was noticed in tall varieties like West Coast Tall and Arasampatti Tall.

Influence of weather factors

Weather factors appeared to assist the spread of the pest. Compared to 2015, the mean maximum temperature increased by 0.9 ºC during 2016 while the morning and evening relative humidity and rainfall decreased by 5.0 per cent, 9.1 per cent and 35 mm, respectively. As much as 337 mm rainfall was received in June-September, 2015 as against 102 mm in 2016, accounting for an approximate 69% reduction in rainfall. The prolonged dry spell, except for a few intermittent showers, from June 2016 onwards could also be one of the predisposing factors for the proliferation and quick dispersal of this invasive pest.

Natural enemy complex

An array of natural enemy fauna including predators viz., coccinellids and chrysopids and an aphelinid parasitoid, Encarsia guadeloupae were found in abundance and contributed for the suppression of the RSW population in an effective manner. In some of the surveyed gardens more

Heavily infested Chowghat Orange Dwarf (September 2016) at CRS, Aliyarnagar

Farmers observing the parasitism by Encarsia under microscope at TK Pudur, Polachi (North) block, Coimbatore district

Awareness programme concucted at CRS, Aliyarnagar

than 80 per cent parasitism by E. guadeloupae was recorded indicating the superior role of this aphelinid parasitoid in bringing down the RSW population.

Ecofriendly management of RSW

As soon as the population build up of the RSW was noticed during 2016, a set of management measures were formulated based on the previous experience with the incidence of spiraling whitefly, Aleurodicus disperses in guava, tapioca, etc. The IPM measures included, installation of yellow sticky traps smeared with castor oil @ 10 / acre for monitoring the RSW adult population, spraying water forcibly on the under surface of the leaves, spraying with neem based botanicals for inhibiting the growth and development of RSW, release of Chrysoperla @ 1000/ ha and distribution of coconut leaflets containing parasitized (by Encarsia guadeloupae) nymphs. These IPM measures were propagandized through various awareness meetings and sensitization programmes. As of now, a total of 3500 farmers in Coimbatore and Tiruppur districts were provided with Encarsia parasitoids and the results have been encouraging thus far. Releasing the parasitoids in infested gardens led to drastic decrease in population from more than 150 adults per leaflet to less than 25 adults per leaflet. Simultaneously parasitisation by Encarsia also increased to more than 70 % (from an initial 10-20 %) within a span of six months.

Conclusion

As an invasive pest in the sub-continent, RSW poses a threat to coconut plantations in South India. However, remarkable levels of natural parasitism by E. guadeloupae coupled with the abundance of coccinellid and chrysopid predators, is keeping the pest under check. Therefore, continuous surveillance, non-chemical approaches and conservation of the natural enemies are the need of the hour to contain the pest. Awareness among the coconut farmers by CRS Aliyarnagar through interactive meetings and awareness-cum- sensitization campaigns to about 1200 farmers led to minimal use of pesticides in the ecosystem thereby build up of natural enemies which are keeping the RSW population under check. The extent of yield loss due to RSW attack in coconut plantations, its biology and ecology in relation to its predators and parasitoids, role of weather factors in the build-up of the pest as well as natural enemies are the areas where the present research is focused upon.

Acknowledgment

The authors wish to acknowledge Director (Centre for Plant Protection Studies), TNAU, Coimbatore, Dr. P. Chowdappa, Director, Dr. H.P. Maheswarappa, PC (Palms), ICAR-Central Plantation Crops Research Institute, Kasaragod for facilitating and providing the guidance for carrying out the studies. The authors also wish to aknowledge Dr. J. Poorani, Principal Scientist (Entomology), National Research Centre for Banana, Trichy for identification of the natural enemies. ■

Export Promotion Schemes

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Export Promotion schemes provide promotional measures to boost India's exports with the objective to offset infrastructural inefficiencies and associated costs involved to provide exporters a level playing field. Brief of these measures are as under

1.Merchandise Exports from India Scheme

Under this scheme, exports of notified goods/ products to notified markets as listed in Appendix 3B of Handbook of Procedures, are granted freely transferable duty credit scrips on realized FOB value of exports in free foreign exchange at specified rate (2-5%). Such duty credit scrips can be used for payment of custom duties for import of inputs or goods, payment of excise duty on domestic procurement, payment of service tax and payment of custom duties in case of export obligation(EO) default.

2. Duty exemption & remission schemes

These schemes enable duty free import of inputs for export production with export obligation. These scheme consists of:-

2.1 Advance Authorization Scheme:

Under this scheme, duty free import of inputs are allowed, that are physically incorporated in the export product (after making normal allowance for wastage) with minimum 15% value addition. Advance Authorization (AA) is issued for inputs in relation to resultant products as per SION or on the basis of self declaration, as per procedures of FTP. AA normally have a validity period of 12 months for the purpose of making imports and a period of 18 months for fulfillment of Export Obligation (EO) from the date of issue. AA is issued either to a manufacturer exporter or merchant exporter tied to a supporting manufacturer(s).

2.2 Advance Authorization for annual requirement

Exporters having past export performance (in at least preceding two financial years) shall be entitled for Advance Authorization for Annual requirement. This shall only be issued for items having Standard Input Output Norms(SION).

2.3 Duty Free Import Authorization (DFIA) Scheme:

DFIA is issued to allow duty free import of inputs, with a minimum value addition requirement of 20%. DFIA shall be exempted only from the payment of basic customs duty. DFIA shall be issued on post export basis for products for which SION has been

notified.

2.4 Duty Drawback of Customs/Central Excise Duties/Service Tax:

The scheme is administered by Department of Revenue. Under this scheme products made out of duty paid inputs are first exported and thereafter refund of duty is claimed in two ways:

i) All Industry Rates : As per Schedule

ii) Brand Rate : As per application on the basis of data/documents

2.5 Rebate of Service tax through all industry rates

Refund of service tax paid on specified output services used for export of goods is available at specified all industry rates.

3. EPCG Scheme

3.1 Zero duty EPCG scheme

Under this scheme import of capital goods at zero custom duty is allowed for producing quality goods and services to enhance India's export competitiveness. Import under EPCG shall be subject to export obligation equivalent to six times of duty saved in six years. Scheme also allows indigenous sourcing of capital goods with 25% less export obligation.

3.2 Post Export EPCG Duty Credit Scrip Scheme

A Post Export EPCG Duty Credit Scrip Scheme shall be available for exporters who intend to import capital goods on full payment of applicable duty in cash.

4. EOU/EHTP/STP & BTP Schemes

Units undertaking to export their entire production of goods and services may be set up under this scheme for import/ procurement domestically without payment of duties. For details of the scheme and benefits available therein FTP may be required.

5. Other Schemes

5.1 Towns of Export Excellence (TEE)

Selected towns producing goods of Rs. 750 crores or more are notified as TEE on potential for growth in exports and provide financial assistance under MAI Scheme to recognized Associations.

5.2 Rebate of duty on "export goods" and "material" used in manufacture of such goods:

Rebate of duty paid on excisable goods exported or duty paid on the material used in manufacture of such export goods may be claimed under Rule of 18 of Central Excise Rules, 2002.

5.3 Export of goods under Bond i.e. without payment of excise duty:

Rule 19 of Central Excise Rules 2002 provides clearance of excisable goods for exports without payment of central excise duty from the approved factory, warehouse and other premises.

5.4 Market Access Initiative (MAI) Scheme

Under the Scheme, financial assistance is provided for export promotion activities on focus country, focus product basis to EPCs, Industry & Trade Associations, etc. The activities are like market studies/surveys, setting up showroom/warehouse, participation in international trade fairs, publicity campaigns, brand promotion, reimbursement of registration charges for pharmaceuticals, testing charges for engineering products abroad, etc. Details of the Scheme is available at www.commerce.nic.in

5.5 Marketing Development Assistance (MDA) Scheme

Financial assistance is available for exporters having an annual export turnover uptoRs. 30 crores for trade fairs, buyer seller meets organized by EPC's/ Trade promotion organizations. MDA guidelines available at www.commerce.nic.in

5.6 Status Holder Scheme

Upon achieving prescribed export performance, status recognition as one star Export House, two Star Export House, three star export house, four star export house and five star export house is accorded to the eligible applicants as per their export performance. Such Status Holders are eligible for various non-fiscal privileges as prescribed in the Foreign Trade Policy.

In addition to the above schemes, facilities like 24X7 customs clearance, single window in customs, self assessment of customs duty, prior filing facility of shipping bills etc are available to facilitate exports.

Export Incentives increased

Focusing on making India a significant participant in world trade and on enabling the country to assume a position of leadership in international trade Government of India released the Mid-term Review of the Foreign Trade Policy 2015-20 on 5th December 2017. Export incentives under Merchandise Exports from India (MEIS) have been increased by 2% across the board for labour intensive MSME sectors.

Revised Export Incentives for Coconut products under the scheme MEIS and DDB.				
Sl. No.	Products	ITC HS Code	MEIS Reward Rate	Duty Draw-back(DDB)
1	Broom	96031000	7%	1.50%
2	Chutney powder	20081920	7%	0.15%
3	Coconut Biscuits	19053100	7%	0.15%
4	Coconut chips	21069099	5%	0.15%
5	Coconut cream	20089999	7%	0.15%
6	Coconut Hookah	96140000	7%	1.50%
7	Coconut Jaggery	17029090	Nil	0.15%
8	Coconut Juice	20098990	7%	0.15%
9	Coconut milk	20098990	7%	0.15%
10	Coconut milk powder	21069050	5%	0.15%
11	Coconut oil	15131100/15131900	Nil	0.15%
12	Coconut oil based Fatty Acid	38231900	2%	1.50%
13	Coconut oil based medicated soaps	34011110	3%	1.50%
14	Coconut shell based activated carbon	38021000	2%	1.50%
15	Coconut shell charcoal	44029010	5%	Nil
16	Coconut shell oval	14049090	7%	0.15%
17	Coconut water powder	21069050	5%	0.15%
18	Copra (Ball & Milling)	12030000	Nil	0.15%
19	Desiccated coconut	8011100	7%	0.15%
20	Dry Coconut	08011220/08011920	5%(for 08011220), 7%(for08011920)	0.15%
21	Flavored coconut milk	20098990	7%	0.15%
22	Fresh Coconut	08011210/08011910	5%(for 08011210), 7%(for 08011910)	0.15%
23	Frozen coconut	08011290/08011990	5%(for 08011290), 7%(for 08011990)	0.15%
24	Grated coconut	08011290/08011990	5%(for 08011290), 7%(for 08011990)	0.15%
25	Hair Cream	33059030	2%	1.50%
26	Nata De Coco	20079990	7%	0.15%
27	Oil cake (Expeller variety)	23065010	5%	0.15%
28	Oil cake (Solvent extracted variety)	23065020	5%	0.15%
29	Other coconut hair oil	33059019	3%	1.50%
30	Perfumed coconut hair oil	33059011	3%	1.50%
31	Shell Buttons	96062910	3%	1.50%
32	Shell Powder	14049090	7%	0.15%
33	Tender coconut water	22029090	3%	0.15%
34	Packed Tender coconut water	22029090	3%	0.15%
35	Vinegar	22090090	3%	0.15%
36	Virgin coconut oil	15131100/15131900	Nil	0.15%

Goods & Service Tax(GST)

Goods and Services Tax (GST) is an indirect tax which was introduced in India on 1st July 2017 and was applicable throughout India which replaced multiple cascading taxes levied by the central and state governments. The GST is governed by a GST Council and its Chairman is the Finance Minister of India. Under GST, goods and services are taxed at the following rates, 0%, 5%, 12% ,18% and 28%.

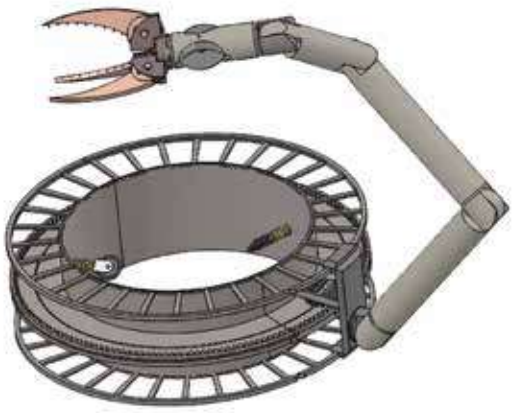
The single GST(goods and service taxes) replaced several former taxes and levies which included: central excise duty, services tax, additional customs duty, surcharges, state-level value added tax and Octroi. Other levies which were applicable on inter-state transportation of goods have also been done away with in GST regime. GST is levied on all transactions such as sale, transfer, purchase, barter, lease, or import of goods and/or services. India adopted a dual GST model, meaning that taxation is administered by both the Union and State Governments. Transactions made within a single state are levied with Central GST (CGST) by the Central Government and State GST (SGST) by the State governments. For inter-state transactions and imported goods or services, an Integrated GST (IGST) is levied by the Central Government. GST is a consumption-based tax/destination-based tax, therefore, taxes are paid to the state where the goods or services are consumed not the state in which they were produced.

The GST rates of Coconut Products effective from 15th November 2017.

Sl. No.	Products	HSN Code	GST
1	Broom	96031000	5%
2	Chutney powder	2008	12%
3	Coconut Biscuits	1905 [other than 1905 32 11, 1905 90 40]	18%
4	Coconut chips	210690	12%
5	Coconut cream	2008	12%
6	Coconut Hookah	9614	28%
7	Coconut Jaggery	1701 or 1702	Nil
8	Coconut Juice	2009	12%
9	Coconut milk	2009	12%
10	Coconut milk powder	2106	18%
11	Coconut oil	1513	5%
12	Coconut oil based Fatty Acid	3823	18%
13	Coconut oil based medicated soaps	3401 [except 340130]	18%
14	Coconut shell based activated carbon	3802	18%
15	Coconut shell charcoal	4402	Nil
16	Coconut shell oval	14049060	Nil
17	Coconut water powder	2106	18%
18	Copra (Ball & Milling)	1203	5%
19	Desiccated coconut	0801	5%
20	Dry Coconut	0801	Nil
21	Flavored coconut milk	2009	12%
22	Fresh Coconut	0801	Nil
23	Frozen coconut	0801	Nil
24	Grated coconut	0801	Nil
25	Hair Cream	3305 [other than 3305 9011, 3305 90 19]	28%
26	Nata De Coco	2007	12%
27	Neera	2201	Nil
28	Oil cake (Expeller variety)	2306	Nil
29	Oil cake (Solvent extracted variety)	2306	Nil
30	Other coconut hair oil	3305 90 19	18%
31	Perfumed coconut hair oil	3305 90 11	18%
32	Shell Buttons	9606 29	18%
33	Shell Powder	1404 [other than 1404 90 10, 1404 90 40, 1404 90 50]	5%
34	Tender coconut water	2202 90 90	Nil
35	Packed Tender coconut water	2202 90 90	12%
36	Vinegar	2209	18%
37	Virgin coconut oil	1513	5%

HSN (Harmonized System of Nomenclature) is an 8-digit code for identifying the applicable rate of GST on different products as per CGST rules.

KERA- Automated Coconut Harvesting Machine



Kerala, which literally means the land of coconut tree, is synonymous with breath-taking back waters and coconut trees. Traditionally professional climbers are engaged for harvesting the nuts. But with time, the profession of tree climbing has lost its lustre and is now it is quite difficult to get professional climbers. This lack of professional climbers has led to sharp increase in coconut harvesting cost, which in turn cuts down the farmer's profit.

All coconut growing regions offers huge market for innovations in coconut harvesting. Almost all existing technologies for automated tree climbing are too complicated. It is in this context that a group of students of Government Engineering College, Thrissur, Kerala under the guidance of Prof. Manesh K K is developing a automatic coconut harvesting machine by making use of a robotic climbing unit along with computer vision and image processing techniques.

The project is undertaken by Amal T P, Ajinsyam S, Amruthakumar P, Amjad Khan, Amal S Kumar, who are final year mechanical engineering students of Government Engineering College Thrissur. The project is being done under the guidance of Prof. Manesh K K and co-guided by Prof. P P Lalu.

The mechanical climbing unit named Kera has a cylindrical structure for gripping the tree trunk as well as a mechanical arm for plucking coconut from trees. The mechanical arm is equipped with cutters for cutting the fronds. A camera and high speed processor is also mounted on the climbing unit. The machine makes use of helical climbing which makes it easy for climbing. Once the unit is fixed at the base of a tree, it is given command to move up. The unit automatically detects the tree top and stops. The machine then completes a rotation around the tree and the camera on top of the machine captures a panoramic view of the tree top.

The image is sent to android device of the operator. The operator identifies the coconuts which are ripe for harvest and selects them through the android control device. This data is relayed back to the machine which translates the 2d location of the selected coconuts to the 3d co-ordinates. Once these co-ordinates are obtained, the mechanical arm moves through the 3d space and pluck the coconut. Also further rotations which may be necessary to arrive at proximity of the coconuts are also carried out. Once all the selected coconuts are plucked, the device waits for further instructions such as instructions to cut the fronds. If no further tasks are required, the device comes down to the base of the tree.

Kera has numerous advantages over other traditional methods of harvesting. It is much safer than all other alternatives prevailing at present. One controller can handle more than one machine at a time allowing for parallel operation and thereby enhancing efficiency. Moreover it is free of any considerable human effort making it an easy to use product when it is difficult to get professional workers. What really makes this product special is its incredible possibility for expansion. In the future the machine can even be used for spraying against diseases and furthermore the need for a human operator can be avoided using advanced image processing techniques and thermal scanning to automatically identify ripe coconuts.

What Kera offers is a new possibility of low cost and safer alternative to all traditional coconut harvesting methods. Kera offers a rift of fresh hope in the niche of coconut farming and may mark a new dawn of agricultural excellence.

The project concept was presented before the Project Approval Committee (PAC) of the Coconut Development Board (Ministry of Agriculture, Govt of India) Kochi and the PAC has approved the project for financial assistance for carrying out the research on the concept. ■

Kisan Mela 2017

Coconut Development Board, Regional Office, Patna participated in Kisan Mela 2017 at Rajendra Prasad Central Agricultural University, Pusa, Samastipur from 3rd to 5th December 2017. Shri. Radha Mohan Singh, Hon'ble Agriculture Minister, Government of India inaugurated the programme. Shri. Ramchandra Paswan, Hon'ble MP, Samstipur, Dr. A K Singh, DDG, ICAR, Dr. Anjani Kumar, Director, Director, ATARI, Patna and Dr. Ramesh Chandra Srivastava Vice Chancellor and Dr. Rajendra Prasad Central Agricultural University, PUSA were present during the occasion.

CDB, RO, Patna displayed coconut based products, handicraft items and informative posters in the stall. Queries of the farmers on coconut cultivation and processing were clarified by the Board's officials. Around 15000 farmers visited the exhibition.

One day training programme on coconut

Coconut Development Board, State Centre, Pitapally, Odisha organized a district level training programme on Coconut Cultivation Technology & Formation of CPSs on 1st December 2017 at Balasore. Shri Sarbeswar Bagurai, Dy.Director, Horticulture, Balasore delivered the welcome address. The training programme was inaugurated by BDO Shri Harish Jena. Dr.Rajat Kumar Pal (Dy.Director, CDB,Pitapalli),Mrs. Neethu Thomas(Technical Officer) and Dr.Sunil Kumar Mahapatra(Scientist & Head KVK,Balasore) were present during the occasion.

In the technical session, Dr.S.K.Mahapatra spoke on "problems and prospects of coconut cultivation in Bhogarai & Baliapal regions. He focussed on cultivars of coconut, planting system, soil and fertilization in coconut.

In the second technical session, Dr.Rajat Kumar Pal, Deputy Director, CDB, Pitapally spoke on CDB schemes and integrated pest and nutrient management practices. He spoke on the need for formation of New CPSs as most of the programmes of the Board are being implemented for the benefit of FPO members. Smt. Neethu Thomas, Technical Officer spoke on CDB schemes and value addition of coconut.

During the interaction session, the farmers raised queries on coconut cultivation, CDB schemes, value addition, formation of CPS etc. CDB officials clarified the doubts of farmers. The training programme helped the farmers to gain knowledge on scientific cultivation aspects of coconut, value addition in coconut, schemes of Coconut Development Board etc.

Around 100 farmers participated in the training programme. The programme ended with vote of thanks by Shri. Santosh Mohapatra, Field Officer CDB.

Agro Vision

Coconut Development Board, State Centre, Thane participated in 9th edition of Agrovision Exhibition 2017 from 10th to 13th November 2017, at Reshimbag, Nagpur, Maharashtra organized by Agro vision Foundation, New Delhi.

The Agrovision exhibition was inaugurated by Shri.Venkaiah Naidu, Hon'ble Vice President of India in the presence of Shri. Devendra Fadanvis, Hon'ble Chief Minister, Govt. of Maharashtra,Shri. Nitin Gadkari, Hon'ble Union Transport Minister, Govt. of India, Shri.Shripad Naik, Hon'ble Minister of State for Ayush, Govt. of Maharashtra, Shri.Sudhir Manguntiwar, Hon'ble Finance Minister, Govt. of Maharashtra, Shri.Pandurang Fundkar, Hon'ble Minister for Agriculture, Govt. of Maharashtra and Shri.Girish Mahajan, Hon'ble Minister for Medical Education, Govt. of Maharashtra and Central Govt. and State Govt. officials. More than 170 national and local exhibitors manufacturing machines, equipments, inputs suppliers and semi processed product in the food industry exhibited their products, food drink items etc.

Coconut Development Board, participated in this exhibition with the objective of identifying distributors,

entrepreneurs and retailers of coconut products from Vidarbha region. Representative of Keratech (P) Ltd. Kerala, manufacturer of virgin coconut oil, desiccated coconut powder, virgin plus tablets, coconut cream, coconut chips and representative of M/s.Mojoco Pvt. Ltd, Pollachi, manufacturer of tender coconut water displayed their products in Board's stall. Various value added coconut products like packed tender coconut water, coconut oil, coconut milk powder, virgin coconut oil and publications of the Board were displayed in Board's stall.

Coconut based food convenience training

Coconut Development Board, State Centre, Odisha organised Coconut Based Food Convenience training programmes in association with Orissa University of Agriculture & Technology at Bhubaneswar from 4th to 7th December,2017. The training was conducted at College of Community Science, Dept. of Home Science, OUAT, Bhubanswar. The participating trainees were selected by OUAT, Bhubaneswar, SHG members of Cuttack, Puri, Dehnkanal, Khurda and Sambalpur districts.

The programme was inaugurated by Dr.Manasi Mahanty, Director, CCS, OUAT, Bhubaneswar. Dr.Diptimayee Jena, Associate Professor, CCS, OUAT, Bhubaneswar addressed the trainees and expressed her happiness to see the interested group of women trainees. Mrs.Ritanjali Parida &Mrs. PuspanjaliBhol, Master Trainers, imparted training on preparation of Virgin Coconut Oil in traditional method & preparation of coconut pickles & use of different preservatives for different products.

On 5th December, 2017, training was imparted on preparation of coconut jam, coconut chips, coconut candy & coconut squash. Dr.Chitrotapla Debadarshini, Asst. Prof. CCS, OUAT spoke on the importance of packaging and marketing of processed coconut food products and briefed about the machineries used in processing of various coconut products, its cost & availability.

On 6th December, 2017, training was given on preparation of coconut cookies, coconut chira, coconut chutney powder and coconut burfi. Dr.Diptimayee Jena, Associate Professor, CCS, OUAT, Bhubaneswar spoke on the importance of food safety processing of processed foods and spoke on food safety & hygienic aspects of processed Foods & FSSI.

On 7th December, 2017, training was imparted on packaging, labelling & displaying of products. After the training a post training evaluation was conducted by CDB. The valedictory function was organised in the presence of Dr.Manasi Mohanty, Director, CCS, OUAT, Bhubaneswar. Certificate to all the participating trainees were distributed in the programme.

Krishithon

Coconut Development Board, State Centre, Thane participated in 12th edition of Krishithon Exhibition - 2017 from 23rd to 27th November 2017 at Nashik, Maharashtra. Shri.Radha Krishna Vikhe Patil, Ex Agriculture Minister and Opposition leader, Government of Maharashtra inaugurated the exhibition in the presence of Shri. Harishchandra Chauhan, Hon'ble Member of Parliament, Lok Sabha, Dindori, Nashik District, Shri.Sanjay Nyaharkar, Chairman, Human Service Foundation, Nashik and other guests present during on the occasion. The best companies among manufacturing machines, equipments, input suppliers and semi processed products in the food industry exhibited their products, food drink items etc. in the exhibition.

Coconut product distributors, entrepreneurs and retailers from Marathvada region displayed their products and services in the Board's stall. Representative of Keratech (P) Ltd. Kerala, manufacturer of Virgin Coconut Oil, Desiccated Coconut Powder, Virgin plus tablets, Coconut Cream etc and representative of M/s.Mojoco Pvt.Ltd, Polachi, manufacturer of Tender Coconut Water had their sales counter in the Board's stall.

Coconut Development Board displayed various value added coconut products like packed tender coconut water, coconut oil, coconut milk powder, virgin coconut oil and informative charts and posters on the health benefits of coconut. Board's publications, journals, leaflets and brochures were also distributed in the stall.

Exposure visit

Coconut Development Board, Regional Office, Guwahati conducted an exposure visit of CPS farmers to DSP Farm, Abhayapuri from Guwahati on 29th. August 2017. 30 farmers attended the exposure visit. Shri Bilich Dan Bara, Farm Manager, DSP Farm, Abhayapuri welcomed farmers and briefed on the maintenance of coconut palm and how to protect coconut palms from pest and disease attacks. An awareness meeting was conducted at DSP Farm, Abhayapuri.

State level workshop on coconut production technologies and value addition, Guwahati

Coconut Development Board, Regional Office, Guwahati organized a state level workshop on Coconut Production Technologies and Value Addition on 11th December 2017 at Shilpgram, Panjabari, Guwahati. Shri K.K. Mittal, IAS, Addl. Chief Secretary & Agriculture Production Commissioner to the Govt.of Assam, was the Chief Guest. Shri Khokan Debnath, Deputy Director, State Centre, Kolkata, Dr. Alpana Das, Scientist-in-Charge, CPCRI, Kahikuchi, Dr. J.C. Nath, Principal Scientist, HRS, AAU, Kahikuchi and Shri Puran Chetry, Chairman cum Managing Director, Abad Agro Farmers Company Ltd were present in the programme. Around 300 farmers attended the programme. Shri Lunghar Obed, Director, CDB, R.O, Guwahati welcomed the guests and farmers. While delivering the welcome address, he said that coconut is insufficient even for pooja ceremonies in Northeast Region. Shri K.K. Mittal, IAS, Addl. Chief Secretary & APC inaugurated the programme. Dr. Alpana Das, Scientist-in-Charge, CPCRI, Kahikuchi spoke on the importance of coconut in Assam.

Speaking on the occasion, Shri K.K. Mittal, IAS, Addl. Chief Secretary & APC to the Govt. of Assam, said that the workshop is aimed at improving the coconut farming and industry in the state. He also informed the farmers that the market situation had changed in recent years, and the coconut is now treated as beneficial to human health and wellness. He encouraged the farmers to take coconut plantation on top priority in order to enhance the revenue of the state and the farmers.

The inaugural session of the programme was concluded with vote of thanks proposed by Shri. Khokan Debnath, Deputy Director, State Centre, Kolkata, West Bengal.

In the technical session, Dr. J.C. Nath, Principal Scientist, HRS, AAU, Kahikuchi spoke on Scientific Coconut Plantation. Shri Puran Chetry, Chairman cum Managing Director, Abad Agro Farmers Company Ltd spoke on the status and prospects of Farmer Producer Organizations in Assam. Shri Khokan Debnath, Deputy Director, CDB, State Centre, Guwahati spoke on CDB schemes and value addition of coconut.

Mr. Vishvas Vidu Sapkal IFS, High Commissioner of India to the Republic of Fiji visited Coconut Development and had interaction with the senior officials of CDB. Seen are Shri. R Jnandevan, Deputy Director, Shri. Saradindu Das , Chief Coconut Development Officer, Shri. K S Sebastian, Assistant Director, Marketing and Shri. Melton Correya, Administrative Officer

State level workshop on coconut cultivation technologies and value addition at Dimapur, Nagaland

Coconut Development Board, Regional Office, Guwahati organized a State Level Workshop on Scientific Coconut Cultivation and Value Addition on 21st November .2017 at Department of Horticulture, Green Park, Dimapur, Nagaland in collaboration with Department of Horticulture, Nagaland. Shri Alan Gonmei, IAS, Commissioner and Secretary to the Government of Nagaland, Department of Horticulture was the Chief Guest of the programme. Shri Elinthung Lotha, Director of Horticulture, Govt. of Nagaland presided over the programme. More than 100 farmers from six districts of Nagaland were present in the programme.

Mrs Thejaseino, Bio-technologist, Department of Horticulture, Green Park, Dimapur, Nagaland welcomed the guest and participants of the programme.

While delivering keynote address, Shri Lunghar Obed, Director, Coconut Development Board (CDB) Regional Office, Guwahati, spoke on CDB schemes and value addition. He also emphasized the importance of coconut by-products which are consumed regionally and internationally, such as fresh green nuts for water and dry nuts for copra, oil, milk, cream, etc. He also highlighted the need for increasing production and productivity of coconut by adopting proper and timely interventions. He informed the farmers that value addition will economically add value to the products. More than 300 value added products can be prepared by using different parts

of coconut. Coconut oil is consumed as food while a significant amount goes into the oleo-chemical industry for the manufacture of cosmetics, detergents, soap and other products. Additionally, the shell and husk are used for the production of fibre, charcoal and various derivatives.

Speaking on the occasion, Alan Gonmei said that the workshop aimed at improving the coconut farming and industry in the state. He also informed the farmers that the market situation has changed in recent years, with coconut being considered as beneficial to human health and wellness. This change according to Gonmei has led to a strong growth in the demand for both raw materials and value added products in local, regional and international markets.

The programme ended with vote of thanks by Shri. Eyongol Angami, Deputy Director, Department of Horticulture, Govt. of Nagaland, Kohima, Nagaland. In the technical session, Shri Lunghar Obed, Director spoke on coconut cultivation technology.

Mr. Daniel Lam, Senior Exhibitions Manager; Hong Kong Trade Development Council (HKTDC) visited CDB on 14th December 2017 and had interaction with the senior officials of CDB. A view of the meeting.

Monthly operations- January

Andaman & Nicobar Islands: Irrigate the palms. The frequency of irrigation and quantity of water depends on the type of soil and the method of irrigation.

Andhra Pradesh: Clean the crowns of the palms. Search for leaf eating caterpillar and destroy the affected leaves by cutting and burning. Detect the palms affected by Ganoderma wilt and drench the plant basin with calixin 5 per cent or aureofunginsol by dissolving 1 g aureofungin + 1 g. copper sulphate in 5 litres of water. The same treatment is to be repeated after 15 days. Isolate the disease affected palm by taking isolation trench around the palm. The healthy palms in the immediate vicinity of diseased palms should be treated similarly with the above solution to prevent further spread of the disease. If attack of the mite is noticed, spray neem oil - garlic - soap emulsion 2 percent or azadiractin @ 4ml per litre or root feed azadiractin @ 7.5 ml with equal quantity of water. Under rainfed condition a light ploughing may be done. Start irrigating the palms.

Assam: Continue irrigation. Attend to intercultural operations around the palm. Continue collection of seednuts from the selected mother palms and store them in a cool dry place. Apply pond silt to coconut garden. Start digging pits of 1m x 1m x 1m size in the main field at a spacing of 8m x 8m in square system for transplanting of seedlings.

Bihar / Madhya Pradesh/ Chhattisgarh: Clean the crowns of the palms. Continue irrigation. If there is scarcity of water, adopt drip irrigation. Keep the basins of palms weed free. Provide shade to the newly planted seedlings. Mulch the basins of the palms with dried leaves. Apply tank silt/forest soil/ compost in coconut gardens. Apply blitox @ 5g/litre or Dithane M 45 @ 2g/litre on the crown and bunches to avoid secondary infections due to cold injury.

Karnataka: Irrigate the palms regularly. Under drip system 60-70 litres of water per palm per day may be given. Raise suitable intercrops under irrigated conditions. If leaf spot disease is noticed spray the leaves with one per cent bordeaux mixture. If the palms are affected by leaf eating caterpillar

cut and burn the severely affected leaves. Spray the underneath of leaves with 0.05 m per cent malathion or 0.02 per cent dichlorvos. Release parasites of suitable stage. If spraying has been done release the parasites only after 15 days in the pest prone areas. If the attack of the mite is noticed, spray neem oil - garlic – soap emulsion 2 percent (20 ml neem oil + 20 gm garlic emulsion + 5 gm soap in 1 litre water) or azadirachtin @ 4ml per litre or root feed azadiractin @ 7.5 ml with equal quantity of water. Plough the land and destroy weeds under rainfed conditions.

Kerala/Lakshadweep: Irrigate young seedlings and adult palms. Clean the crowns of palms. Cut and remove all the senile and unproductive palms from the garden. Continue the prophylactic spraying either with bordeaux mixture or any other copper fungicides available in the market. If the attack of leaf eating caterpillar is noticed, spray the under surface of affected leaves with 0.02 per cent dichlorvos or malathion. Select mother palms for seednut collection. Start irrigation. If mite infestation is noticed clean the crowns of the palms and spray neem oil - garlic - soap emulsion 2 percent or azadiractin @ 4ml per litre or root feed azadiractin @ 7.5 ml with equal quantity of water.

Maharashtra/Goa/Gujarat: Clean the crowns of the palms by removing dead and decaying matter. Spray the crowns with one per cent bordeaux mixture if fungal diseases are noticed. If the attack of leaf eating caterpillar is severe, cut and remove all the affected leaves and spray the lower side of the leaves with 0.05 per cent malathion or 0.02 per cent dichlorvos. Release parasites only after 15 days of spraying.

Orissa: Seasonal intercrops may be sown. Irrigate coconut and the intercrops. Incorporate green manure. Coconut basins may be mulched with coir pith/ husk etc.

Plant protection chemicals may be applied according to the pest/ disease. If the attack of eriophyid mite is noticed root feed azadirachtin 5 per cent @7.5 ml with equal quantity of water. Clean the crown. Continue other maintenance operations to the intercrops as well as coconut.

Tamil Nadu/Puducherry: Clean the crowns of the palms. If rain is not received in early January, start the regular irrigation. Treat the stem bleeding affected palms by applying coaltar or bordeaux paste after removing the affected tissues. Dig isolation trenches of 1m deep and 50cm wide, 2 meters away from the base of the palms affected by Thanjavur wilt. Apply 5kg neem cake per palm per year. Drench the basins with 40 litres of one per cent bordeaux mixture per palm. Treat the palms with 100 ml calixin 5 per cent through root feeding at quarterly intervals for one year. In areas where mite infestation is noticed, spray neem oil - garlic - soap emulsion 2 percent (20 ml neem oil + 20 gm garlic emulsion + 5 gm soap in 1 litre water) or azadiractin @ 4ml per litre or root feed azadiractin @ 7.5 ml with equal quantity of water especially on the perianth region of buttons and affected nuts.

Tripura: Irrigate the palms at an interval of 3-4 days. The basins of each palm should be mulched with leaves, to reduce the loss of soil moisture. Before mulching, drench the basins with chlorpyriphos 0.05 per cent to avoid the attack of termites. Provide partial shade to new plants to protect from scorching. One per cent bordeaux mixture or any other copper fungicide may be sprayed to protect the palms from bud rot or leaf rot.

West Bengal: Continue harvesting of nuts. Start irrigating young seedlings in the field as well as in nursery and provide shade. Select mother palms for seednut collection. ■

Market review – November 2017

Domestic price

Coconut Oil

During November 2017 the price of coconut oil opened at Rs. 16900 per quintal at Kochi market and Alappuzha market and Rs.18500 per quintal at Kozhikode market. The price movement in all the three markets in Kerala expressed an upward trend during the month.

The price of coconut oil closed at Rs.19000 per quintal at Kochi and Alappuzha market and Rs.21300 per quintal at Kozhikode market with a net gain of Rs.2100 at Kochi and Alappuzha market and Rs.2800 per quintal at Kozhikode market.

The price of coconut oil at Kangayam market in Tamilnadu, which opened at Rs.16000 per quintal, expressed an upward trend and closed at Rs.17333 per quintal with a net gain of Rs.1333 per quintal.

Table1: Weekly price of coconut oil at major markets Rs/Quintal)

	Kochi	Alappuzha	Kozhikode	Kangayam
01.11.2017	16900	16900	18500	16000
05.11.2017	17900	17900	19600	15867
12.11.2017	17900	17900	19700	NR
19.11.2017	18600	18400	20700	16667
26.11.2017	19000	19000	21300	17200
30.11.2017	19000	19000	21300	17333

Milling copra

The price of milling copra at major markets moved in tune with the prices of coconut oil. During the month, the price of milling copra opened at Rs.11700 per quintal at Kochi, Rs.11350 per quintal at Alappuzha market and Rs.12100 per quintal at Kozhikode market. The price movement in all three markets in Kerala expressed an upward trend during the month.

The price closed at Rs.13800 at Kochi, Rs.12600 per quintal at Alappuzha market and Rs.13900 at Kozhikode markets with a net gain of Rs.2100 per quintal at Kochi and Rs.1250 per quintal at Alappuzha market and Rs.1800 per quintal at Kozhikode market.

At Kangayam market in Tamilnadu, the prices expressed an upward trend. The prices opened at Rs.11000 and closed at Rs. 12300 per quintal with a net gain of Rs.1300 per quintal.

Table2: Weekly price of Milling Copra at major markets (Rs/Quintal)

	Kochi	Alappuzha (Rasi Copra)	Kozhikode	Kan-gayam
01.11.2017	11700	11350	12100	11000
05.11.2017	12700	12000	12650	11000
12.11.2017	12700	12000	12700	11000
19.11.2017	13400	12250	13500	11500
26.11.2017	13800	12600	NR	12300
30.11.2017	13800	12600	13900	12300

Edible copra

The price of Rajapur copra at Kozhikode market which opened at Rs.15000 per quintal expressed a downward trend during the first three weeks of the month. During the fourth week the price of edible copra increased and closed at Rs.15100 per quintal with a net gain of Rs.100 per quintal.

Table3 :Weekly price of edible copra at Kozhikode market (Rs/Quintal)	
01.11.2017	15000
05.11.2017	14350
12.11.2017	14200
19.11.2017	15000
26.11.2017	15100
30.11.2017	15100

Ball copra

The price of ball copra at Tiptur market which opened at Rs.12800 per quintal expressed a mixed trend during the month and closed at Rs.12800 per quintal.

Table 4 : Weekly price of Ball copra at major markets in Karnataka (Rs/Quintal)	
	Tiptur
01.11.2017	12800
05.11.2017	13000
12.11.2017	13200
19.11.2017	13200
26.11.2017	13100
30.11.2017	12800

Dry coconut

At Kozhikode market, the price of dry coconut opened at Rs.10300 per quintal. The price expressed a mixed trend and closed at Rs.9350 with a net loss of Rs.950 per quintal.

Table5 : Weekly price of Dry Coconut at Kozhikode market (Rs/1000 coconuts)	
01.11.2017	10300
05.11.2017	9850
12.11.2017	9350
19.11.2017	9150
26.11.2017	9250
30.11.2017	9350

Coconut

At Nedumangad market, the price of partially dehusked coconut opened at Rs. 18000 and closed at Rs. 21000 with a gain of Rs.3000 per thousand nuts. At Pollachi market in Tamil Nadu, the price of coconut opened at Rs. 18000 and closed at Rs.19000 per thousand nuts with a net gain of Rs.1000 per thousand nuts. At Bangalore APMC, the price of partially dehusked coconut opened at Rs. 13500 and closed at Rs. 14000 with a gain of Rs.500 per thousand nuts during the month. At Mangalore APMC market the price of partially dehusked coconut of grade-I quality ruled at Rs.22500 per thousand nuts.

Table 6: Weekly price of coconut at major markets (Rs /1000 coconuts)				
	Neduman-gad	Pollachi	Banglore	Mangalore (Grade-1)
01.11.2017	18000	18000	13500	22500
05.11.2017	19000	18000	14000	22500
12.11.2017	21000	18000	14000	22500
19.11.2017	21000	18000	14000	22500
26.11.2017	21000	19000	14000	22500
30.11.2017	21000	19000	14000	22500

Tender coconut

The price of tender coconut at Maddur APMC market in Karnataka opened at Rs.10000 per thousand nuts and remained at the same level throughout the month.

Table7 : Weekly price of tender coconut at Maddur market (Rs/1000 coconuts)	
01.11.2017	10000
05.11.2017	10000
12.11.2017	10000
19.11.2017	10000
26.11.2017	10000
30.11.2017	10000

International price

Coconut oil

The international and domestic price of coconut oil at Philippines expressed an erratic trend whereas the domestic price of coconut oil at Indonesia expressed a declining trend during the month. In India the price of coconut oil expressed an upward trend. The price of coconut oil quoted at different international/ domestic markets is given below.

Table 8: Weekly price of coconut oil in major coconut oil producing countries during October 2017

	International Price(US$/MT)	Domestic Price(US$/MT)		
	Philippines/ Indonesia (CIF Europe)	Philippines	Indonesia	India*
4/11/2017	1578	1500	1550	2760
11/11/2017	1554	1503	1538	2760
18/11/2017	1563	1508	1515	2837
25/11/2017	1551	1497	1515	2837

* Kochi Market

Copra

The domestic price of copra at Philippines and India expressed an upward trend whereas price of copra in Indonesia expressed a slight decline in the price during the first week and then stabilized during the remaining weeks. The price of copra in Srilanka expressed a mixed trend. The price of copra quoted at different domestic markets is given below.

Table 9: Weekly price of copra in major copra producing countries during October 2017

	Domestic Price(US$/MT)			
	Philippines	Indonesia	Srilanka	India*
4/11/2017	931	911	1472	1958
11/11/2017	934	881	1496	1958
18/11/2017	934	881	1484	2035
25/11/2017	941	881	1485	2128

* Kochi Market

Coconut

The price of coconut quoted at different domestic markets in Philippines, Indonesia, Srilanka and India are given below.

Table 11: Weekly price of dehusked coconut with water during October 2017

Date	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India*
4/11/2017	200	222	360	617
11/11/2017	222	237	351	632
18/11/2017	229	237	443	648
25/11/2017	231	237	445	655

*Pollachi market

Desiccated coconut

The price of desiccated coconut in major desiccated coconut exporting countries are given below:

Table 10: Weekly price of desiccated coconut during October 2017

	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India*
4/11/2017	2502	2450	3352	2416
11/11/2017	2502	2450	3365	1965
18/11/2017	2447	2450	3627	2556
25/11/2017	2447	2450	3453	2679

*FOB