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Status, problems and prospects of coconut cultivation in Gujarat

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The coconut palm is one of the five legendary Devavrikshas and is eulogised as Kalpavriksha - in Indian classics. All parts of the palm are used in one or another way in the daily life of the people of the country in the traditional coconut growing areas. Its fruit is called Lakshmi Phal and is used in social and religious occassions irrespective of whether the palm is locally grown or not.

In India, coconut is cultivated in 18 states and 3 Union Territories. Almost 90% of total area under coconut cultivation and 93% of total production falls within four southern states viz., Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. There are some other traditional coconut growing states where more area can be brought under coconut cultivation. Especially states like Goa, Maharashtra and Gujarat having favourable agro climatic conditions and coastal line offer good potential. Since coconut as a crop offers lot of opportunities for intercropping and mixed cropping, a 'coconut based integrated farming system' is needed to be encouraged in these potential areas of traditional states. On the eastern coast, parts of West Bengal, Odisha and Andhra Pradesh are having conducive agro climatic conditions, where coconut based integrated farming system can be introduced. Non-traditional states like Bihar, Chhattisgarh, Jharkhand and the entire North Eastern states also offer areas which are quite suitable for coconut cultivation and coconut based farming system. In non-traditional coconut growing areas, there is a huge demand for tender nut and hence the coconut plantations solely dedicated for tender nut purpose are picking up recently and needs further encouragement.

Present status of coconut cultivation in Gujarat

Coconut is one of the important plantation crops of Gujarat state, particularly in coastal belt of 1600 kms,

the highest for any state in the country. As per statistics of 2015-16, the total area under coconut cultivation in Gujarat was around 22,813 ha. with a production of 312.68 million nuts and productivity of 13706 nuts/ha. thereby occupying the seventh position among Indian states in area and production and the fourth rank in productivity. About 60 per cent of the area and production of coconut comes from the undivided coastal districts of Junagadh, Bhavnagar, Valsad, Gir Somnath and Dev bhumi Dwarka. The area under coconut plantation in Gujarat has increased from 14,650 hectares in 2005-2006 to 22,813 ha in 2015-2016. Coconut is generally utilized as matured nuts during festival seasons and people are not much aware about the value added products.

Coconut research in Gujarat

In Gujarat, two major research organisations are working with a mandate to increase coconut production in the state. One is Agriculture Research Station (Fruit Crops), Mahuva (Dist.: Bhavnagar) under Junagadh Agricultural University which was established with an objective to bring fallow land of coastal area under horticulture crops like mango, coconut, arecanut, chiku, banana, etc. AICRP on palms centre was operating at the station, with the objective of evolving high yielding variety of coconut, to determine most suitable and effective agronomical practices for the coconut production, to supply the hybrid coconut seedlings to the farmers and to find out suitable plant protection measures against coconut pest and disease. Another station is, Horticulture Research Station, ASPEE College of Horticulture and Forestry, Navsari under Navsari Agricultural University, where in ICAR-AICRP on palms centre is operating since 2009. Both the centres are working with the objective of collection, evaluation and maintenance of indigenous and exotic germplasm of coconut palm, to generate germplasm for developing high yielding pest and disease resistant and high yielding varieties of coconut, testing of newly developed genotypes under various environments to find out their suitability,

Coconut nursery at Mahuva

to develop location specific production technology including harvest and post-harvest technology as well as organic farming practices, to produce and distribute good quality seedlings of different varieties of coconut and to disseminate production technology of coconut crop to the farmers using various extension tools.

Achievements of ICAR-AICRP on Palms centre

The AICRP centre helped in improving overall coconut yield and productivity of the state by encouraging farmers to use quality planting materials and advocating farmers for adoption of scientific technologies for coconut production.

Crop improvement

Germplasm collection and evaluation: Four local germplasms were collected and being evaluated.

Demonstration of released varieties of coconut: The coconut varieties Kera Bastar, Kalyani coconut-1, Kalpa Mitra, Kalpa Dhenu, Gauthami Ganga and Kalpa Prathibha were found suitable to the local agro-climatic conditions of the state.

Evaluation of cocoa clones for their performance as mixed crop in coconut gardens:

The clone VTLCC-1 performed better with respect to growth, yield and quality of cocoa.

Intercropping with turmeric

HDMSCS with banana and elephant foot yam

Crop Production

Development of coconut based integrated cropping system model:

• Turmeric as intercrop in coconut garden.

• The combinations of coconut + banana + turmeric + elephant foot yam + black pepper was found profitable compared to monocropping of coconut.

• Noni (Morindacitrifolia) as inter-crop in coconut: Noni was identified as a promising component crop in coconut based mixed cropping system where, the seedlings were found better compared to tissue culture plants.

• Farmers in Junaghad and Gir Somanath area are practicing the intercropping of banana and vegetable crop in coconut gardens.

Potential for coconut sector

Coconut cultivation should be extended to other non-traditional districts of the state besides the traditional coastal districts. It is estimated that another 40,000 ha area can be brought under coconut with the collaborative efforts of the Government of Gujarat as well as ICAR- All India Coordinated Research Project on Palms by implementing location specific programmes in the state. Even though Gujarat is a coconut producing state, there is no coconut oil production unit in the state. However, there is a good market for coconut oil for toiletry purpose with annual consumption of about 8 thousand tonnes per year. In summer months, demand for tender coconut is increasing. The consumption of edible copra is not much in the state whereas, the demand increases during the festival season. Desiccated coconut powder is mainly used by biscuits, bakery and sweets manufacturing industries. There are few manufacturing units in private and cooperative sector located in and around Junagadh, Bhavnagar and Valsad districts. Keeping in view of the potential for production and post-harvest processing of coconut, integrated development approach should be taken for further expansion of coconut production and development of coconut industries in the state.

Opportunities for enhancing productivity

Since the land holdings of coconut farmers in Gujarat state are very small, the suitable method for enhancing on-farm income is through the promotion of coconut based farming system. Government of Gujarat and ICAR-AICRP on Palms need to work together to converge various schemes/ programmes under NHM, RKVY, ATMA and state plan being implemented in the state to provide maximum benefits

to the farming community. More emphasis should be given to increase the area under coconut, improving the productivity of existing plantations, capacity building on the latest technology, skill training, awareness campaign for entrepreneurship on coconut based industry etc. Timely supply of quality planting material at the doorstep of the farmers should be ensured by the Government agencies. Concerted efforts need to be done by the Coconut Development Board as well as the Directorate of Horticulture, Government of Gujarat for improving the production and productivity of coconut by adopting innovative schemes and technologies suitable for the location. Integrated coconut based industry for value added products like packed tender nut water, desiccated coconut, virgin coconut oil, activated carbon, shell charcoal, coir based products etc. should be established in major coconut growing districts for increasing the coconut price at farm gate.

Financial assistance extended under NHM can be made available to the farmers for adopting coconut based farming system by integrating the implementation of suitable NHM and CDB schemes. In order to promote replanting/under planting with quality seedlings, the nursery programmes in the state both private and public sector may be linked with the replanting programmes to make seedlings available to the farmers. The nursery programme should be targeted to produce and supply only high yielding hybrids or selected ecotypes which are suitable for cultivation under different agro climatic conditions. Planting of dwarf varieties in new locations as well as in existing gardens where space is available should be encouraged for ensuring regular supply of tender nuts.

The APMC, Mahuva (Junagadh) is the major market for matured nuts and accounts for nearly 70 per cent of the total sale of the matured nuts. However, recently Una, Kodinar, Mangrol, Gir

Somnath and Devbhumi Dwarka have also developed the independent assembling and marketing centre of coconut in the state. It has been reported that about 20 per cent of the total coconut produced in the state are consumed as tender nuts and 5 per cent are retained by the farmers for household and seed nut purpose. Farmers harvest tender nuts and they transport it to collection centres in small trucks or small vehicles. In collection centres they load it to large trucks for transporting to different parts of the country. About 42 per cent of the coconut production is consumed in the state itself and 33 per cent is moved to Delhi, Punjab, Haryana, Maharashtra and Madhya Pradesh. Since the tender nuts are available throughout the year, they are sold all over the state along the highways, bus stand, railway station and rural market centres. The demand increases to the maximum during peak summer months from March to June.

Tendernut trade in Gujurat

Constraints in coconut farming

Coconut in Gujarat is essentially a homestead crop and forms the main component of various crops grown by the farmers. Small size of holdings is the characteristic feature of land holdings in Gujarat. Most of the holdings are less than 0.1 ha and only few farmers possess holdings of size above 0.40ha. Since the size of holdings is small and most of these are homestead gardens it could not generate adequate income to support the dependant families. Labour shortage and high labour charges also force the farmers to ignore the timely adoption of agronomic practices and regular harvesting. As a result they neglect adoption of management practices especially in small holdings leading to low productivity and high cost of production. High density of over 200 plants per hectare coupled with poor adoption of management practices leads to low productivity. Though organic manure application is practiced by majority of farmers, the application of inorganic fertilizers to the recommended level is practiced only by few farmers. Most of the holdings follow traditional cultural practices. Severe infestation of diseases and pests are other major problem faced by the farmers in growing new palms for reviving coconut gardens.

Scientific plant protection measures and fertilizer application are yet to be adopted on a wider scale. The reasons for this low level of technology adoption are high cost of fertilizers and difficulty in getting the trained persons for applying plant protection measures. The limitations in the areas of plant protection and fertilizer application should be removed by providing financial assistance through development programmes. Due to shortage of raw materials for coconut based industries as well as poor marketing infrastructure, the entrepreneurs are not coming forward for establishing coconut based industries in Gujarat state.

State programmes/plans/schemes on the development of coconut industries

Now the ICAR, SAU's and Directorate of Horticulture, Gujarat state are working on an ambitious coconut cultivation programme with an outlay of maximum budget during last five years, that aims not only to bring back its old glory, but also make Gujarat one of the top three states in coconut productivity and area under plantation. Concerted efforts need to be done by the SAU's as well as the Directorate of Horticulture, Government of Gujarat for improving the production and productivity of coconut by adopting innovative schemes and technologies suitable for the farming community. All the potential area suitable for coconut cultivation in Gujarat (about 40,000 ha) should be brought under coconut on a mission mode by the agricultural universities as well as Government of Gujarat by providing higher incentives and supplying quality seedlings in time at the door step of the interested farmers. Farmers should be encouraged to adopt drip irrigation system and should adopt coconut based high density multiple cropping system with other profitable crops to increase the production and productivity of coconut as well as to enhance the income of the farming community from unit area. Integrated coconut based industry for value added products like packed tender coconut water, neera, coconut sugar, desiccated coconut, virgin coconut oil, activated carbon, shell charcoal, coir based products etc. should be established in major coconut growing districts for increasing the coconut price at farm gate as well as enhancing the better utilization of coconut. ■

Coconut sector experiencing an all time high price rise

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Coconut farmers are more confronted with market-related difficulties such as low and highly fluctuating prices and difficulty to find favorable market outlets for their products rather than the technological challenges which result in low productivity in the farm. The failure to move up the global value chain and there by resisting the market pressure on domestic prices in an open economy environment was reported as one of the major causes of the price rigidity experienced in the coconut sector for a decade or so. Contrary to this, what we are witnessing in the coconut sector in recent times could be arguably termed as a price rise regime. A soar in prices of coconut and coconut products is observed now. The price of coconut oil is at Rs.223/kg which Rs.-124/kg 10 months ago, in the beginning of the year 2017 or an increase of 77.58 percentage over a period of 10 months. The price rise regime in case of coconut in recent times has certainly caused confusion among all the stake holders of coconut sector. Hence, it is pertinent to seek the reasons behind such a price escalation, especially after having experienced long time price stagnation. A variety of factors have contributed to the persistence of this price rise regime about which not much is still known. A modest attempt has been made to analyze some of these factors attributed to the price rise.

Price rise regime

The coconut market in India is always unstable and uncertain due to frequent fluctuations in prices. Usually fluctuation in price occurs due to change in market conditions created in response to seasonal and annual variation in production apart from competition from other edible oils particularly palm oil. Maximum price is reported in the month of November which is the lean production period and minimum price in April – May which is the peak production period. Both these seasonal variation in prices of coconut and coconut oil are more due to supply factors than due to demand factors. Usually, the magnitude of fluctuation is higher during lean period compared to peak period. As depicted in table.1 the price of coconut in January, 2017 was Rs. 2769 per quintal. The increasing trend continued during the year 2017 and has reached the an all time record price of Rs. 4950 per quintal by January 2018. Normally the price decreases in the peak production period, it is expected that, during

Table 1. Price trend in coconut and coconut oil

Sl. No.	Month	Coconut oil (Rs. per quintal) Kozhikode Market)	% increase in price of coconut oil compared to previous month	Copra(Rs.per quintal) Kozhikode Market)	% increase in price of copra compared to previous month	Coconut (Rs.per quintal) Nedumangad Market	% increase in price of copra compared to previous month
1	Jan -17	12440		8060		2769	
2	Feb-17	13892	11.67	8827	9.52	3375	21.89
3	Mar-17	13415	-3.43	8643	-2.08	3199	-5.21
4	Apr-17	14326	6.79	9163	6.02	3273	2.31
5	May-17	14312	-0.10	9123	-0.44	3210	-1.92
6	Jun-17	14444	0.92	9178	0.60	3150	-1.87
7	Jul-17	14881	3.03	9617	4.78	3150	0.00
8	Aug-17	16258	9.25	10517	9.36	3279	4.10
9	Sep-17	18091	11.27	11741	11.64	3829	16.77
10	Oct-17	18544	2.50	12042	2.56	4163	8.72
11	Nov-17	20179	8.82	13096	8.75	4500	8.10
12	Dec-17	21710	7.59	14158	8.11	4862	8.04
13	Jan-18	22092	1.76	14400	1.71	4950	1.81

the coming peak season, in April-May the decreasing trend is anticipated. The prices of coconut oil are touching the historic mark of Rs. 22092/quintal as the south Indian market is facing supply crunch of copra as well as coconut oil.

Growing demand and short supply have pushed coconut prices up several folds that they are being sold in kilograms and not per piece as it used to be. A kilogram which usually constituted two small-sized nuts is sold for Rs 60/- If it weighed about 600 grams it is sold at Rs35/- Farmers are of the opinion that the price of coconut has continued on upward trend ever since they started to sell it on weight basis. The supply to the market has dropped drastically as farmers were not getting good returns and drought had taken its toll on many thousands of acres of coconut farms in Tamlnadu. The traders say that this is not a phenomenon confined to Tamil Nadu, but even the other coconut-producing states like Kerala, Karnataka and Andhra Pradesh had seen production going down. Traders from these states were also coming to Tamil Nadu for stocks leading to the price hike. A coconut that sold for Rs 17 in August this year has been selling for Rs30 in February 2018 in the retail market. Another problem is that when coconuts are sold by weight, the ones that are not mature enough sell for more.

Major factors behind the price rise

Production related factors (Supply deficit)

At the domestic level, the price rise regime of coconut could be very well linked to the decline in production of coconut in major southern states, Kerala, Karnataka, Tamilnadu and Andhra Pradesh. Kerala's share in the total production of copra in the country has been declined to 46% from 90% fifteen years ago. The area under coconut has been shrinking continuously since the year 2000 due to various factors. Area under coconut has declined from 8,98,000 ha. to 7,70,000 ha. in Kerala during the period from 2005-06 to 2016-17. Shift in cultivation to other more remunerative crops, high cost of cultivation and low return from coconut, prevalence of pests and diseases like root wilt, budrot, etc could be attributed as the reasons for the negative growth rate in area and production of coconut in Kerala. It is also noteworthy that, being a land scarce economy with high land prices, Kerala faces the danger of diversion of land resources for other profitable ventures notably real estate and other development initiatives, rapid urbanization undergoing in the state which causes conversion of coconut area for housing and construction of commercial building, roads etc. Hence the magnitude of shortfall in production in

Kerala, the major coconut producing state is much higher than the earlier estimate because of reduction in area.

Constraints hampering production

The coconut sector is confronted with a number of challenges which has resulted in deterioration of production environment and productivity. Fragmented holdings, scattered production, the homestead nature of cultivation, incidence of pests and diseases and the large stock of senile palms are the major constraints in coconut cultivation. Lack of adoption of scientific cultivation practices including balanced nutrient management is one of the reasons for declining productivity trends in some regions of the country. Coconut palm is infested by a number of pests and diseases. Some are lethal in nature while others reduce the production potential of the palm. Root (wilt) disease has adversely affected coconut production throughout Kerala and is spreading to nearby states like Tamil Nadu and Karnataka also. Apart from this, the bud rot disease, pests like eriophyid mite, red palm weevil, rhinoceros beetle and white fly also have adverse effect on production of coconut. The incidence of pests and diseases in coconut is increasing due to the constraint that most of the plant protection operations are to be carried out at the crown. This makes the process tiresome coupled with the old/ senile and uncared palms due to absentee landlordism served as breeding sites for the insects and pathogens.

The fact that coconut sector in the country is dominated by millions of small and marginal farmers and mainly confined to the economically and ecologically vulnerable regions, plays a crucial role as far as the production is concerned. In the long term context, the major challenge is to produce enough to meet the growing demand under changing climate conditions, the dwindling agricultural land/water and other natural resources and skilled labourers. Recurring drought as well as emergence of new pests and diseases in majority of the coconut growing regions, necessitates development of strategies for drought mitigation and pest management. There is a need to develop sustainable production systems along with proper management practices for judicial utilization of the harvested water in conjunction with the available ground water. It also necessitates identification of genotypes perform well under extreme high and low temperatures.

Non-availability of sufficient quantity planting materials of new and improved high yielding varieties is one of the major problems faced by the farmers who are interested in coconut cultivation. Dearth of skilled labour for farm operations including harvesting, plant protection measures, crown cleaning, etc. are another reasons for lesser productivity. The natural calamities like droughts due to deficit monsoons, cyclones, and climate change affect the coconut production and productivity.

Besides the low price prevailed in the last few years, shortage of labour, high wages and incidence of diseases have caused negligence of this crop by the farmers and resulted in decline in production. The change in climate pattern and shortage of labour had also affected the crop management in the state. Rain fed nature of the crop is considered as one of the major reasons for low productivity of coconut in major coconut growing states. There is ample scope for wider adoption of irrigation system in the country especially in areas where rain fall is scanty and water is the limiting factor and thereby enhances the production and productivity of coconut.

Surging industrial demand

Low level use of coconut for value addition is another challenge faced by coconut industry in India. Out of the total production of coconut in the country, about 45 percent is used as mature nuts, 39 percent is used for copra and 16 percent is consumed in the tender form for drinking purposes. Ninety percent of the mature raw nuts are consumed for domestic purpose and a meager ten percent is absorbed by the industry for converting into value added products like desiccated coconut, coconut milk/cream/powder and other products. In order to upgrade into a commercially vibrant sector, there is an urgent need to restructure the existing consumption pattern through providing more emphasis on value added coconut products.

The introduction of Technology Mission Programme on coconut by Coconut Development Board since 2001-02, has given adequate emphasis on product diversification and market promotional activities in coconut sector. 439 new coconut

Table - 2 : Coconut Processing units assisted under TMOC (2002-2016)

Sl. No.	Product	No. of units	Capacity (Million Nuts per year)
1	Copra & Coconut oil	105	1221.07
2	Desiccated coconut powder	103	1011.45
3	Virgin Coconut Oil	54	216.56
4	Ball copra	47	20.94
5	Activated Carbon from Coconut Shell	31	75904 MT/Year
6	Tender Coconut processing unit	25	138.6
7	Coconut Shell charcoal	25	43115 MT/Year
8	Neera processing unit	11	22260 Kilolitre/year
9	Coconut Shell Powder	18	60976 MT/Year
10	Coconut Chips & other products	11	3.09
11	Coconut Vinegar	06	19860 Kilolitre/year
12	Coconut Milk & Milk Powder	03	16.50
	Total	**439**	**2628.21 Million nuts/year**

processing units with capacity to process more than 2600 million nuts per year has been established under the programme for value addition and by product utilization and thereby extended opportunities for diversification of coconut products. 25 tender coconut water preserving and packing units were established with capacity to process 138.6 million tender nuts per year. More over, 103 desiccated coconut powder units with capacity to process 1221 million nuts per year, and 54 virgin coconut oil production units with capacity to process 217 million coconut per year have also been established. These kernel based products have undoubtedly helped to improve the price of coconut to a certain extent by shifting the normal pattern of pricing depending on coconut oil (Table- 2). The increase in consumption of tender coconut water could be attributed as another reason for increase in trend in price shown during the last peak season. Aggressive promotional activities have also created awareness on the health aspects of coconut products and as a result, enhanced market potential for coconut products both in domestic and international markets.

Coconut oil production happens to be the major area which depends on the annual coconut production. With the development taken place as a result of implementation of TMOC scheme, production and export of dedicated coconut, multi-filtered packed and branded coconut oil production, Virgin coconut oil, ball copra, coconut milk powder, packaged tender coconut water have increased many fold during the last five years. Currently it is the buying support from the branded coconut oil segment which is keeping the prices at reasonably higher level. Many consumers have moved from loose to branded oil for purity and safety. This could be another reason for rise in demand of copra and coconut. Short supply and a sharp rise in demand have led to increase in prices of coconut oil which to a large extent determines the prices of coconut.

Through this paper an attempt is made to characterize the price rise in coconut sector during the past one year and also delineated the major possible reasons behind the price rise regime. The analysis revealed that steep rise in coconut price associated with less supply due to decline in productivity and high demand for export and processing units within the country. In a nut shell the major reasons could be attributed to the recent price escalations that are the supply deficits and surging industrial demand. Nevertheless, the insufficient stock to cater to large industrial demand and delicate demand-supply balance will keep the prices firm at least for a short period. However a systematic study on the various factors associated with the rise in coconut price is required to prove the extent to which the above factors affect the magnitude of rise in price of coconut and its sustainability. ■

SALAM KELAPA

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Salam Kelapa – people of the Indragiri Hilir Regency in Indonesia greet each other with these words which literally mean greetings to coconut. Coconut is so special and of high value to the people of this Regency, which has the highest area and production of coconut in the archipelago of Indonesia. The respect and regard for coconut in the region is unique. Coconut is an integral part of the economy, food security and livelihood security of the region. The value given to coconut is so great that even the streets are lit with street lights resembling a coconut bunch with leaves. The traditional Indonesian Batik specific to the Indragiri Hilir region has motifs mainly comprising of images of coconut palms, coconuts, copra etc. The Regency officials wear uniformed Batik clothes with coconut motif during special occasions and events. Such is the passion for coconut in Indragiri Hilir Regency.

“The respect and regard for coconut in the Indragiri Hilir Regency of Indonesia is very unique. Coconut is an integral part of the economy, food and livelihood security of the region. The value given to coconut is so great that even the streets are lit with street lights resembling a coconut bunch with leaves.”

Coconut in Indragiri

Indragiri Hilir Regency in Riau Province of Indonesia has the largest area under coconut cultivation in the country. Tembilihan is the capital of Indragiri Hilir. Traditional coconut stands, mostly of tall varieties dominate the region; the plantations are generally healthy without much infestation by pests and diseases. The area under cultivation comes to around 4.3 lakh hectares and the coconut gardens are mostly densely populated. It is estimated that the region produces around 90 lakh nuts per day of which around 50 lakh nuts are processed in the region itself. More than 75% of the income generated in the region is from coconut.

The coconut growing regions in the area are mostly in tidal affected wetlands which are interspersed with natural rivers and man-made canals. The area gives the impression of coconut cultivation along the backwaters of Kerala, but the plantations in Indragiri Hilir are larger. The land is mostly comprised of peat soil and is under tidal influence. This benefits the region since the soil nutrients brought in by the high tide remain and offer proper nourishment to the crop. Moreover the canals and natural rivers help in maintaining soil moisture content throughout the year. Adequate infrastructure for water management through embankments, canals and sluice gates are installed in the area for effective control and management of water flow during the tides.

Coconuts are harvested usually using a hook or by climbing and transported from the plantations by floating them downstream through the canals. The nuts are floated when the tide is up and they flow downstream when the tide is down. Further they are picked from the water using sharp iron rods and transported in large wooden boats to the factories. The major factories in the region have their own dock areas wherein the wooden boats queue up for unloading their produce. At times the boats have to wait for long; and long queues of boats waiting at the dock area is a common sight in the region.

Marketing

The Indragiri Hilir Regency is very strategically located that it is easily accessible from Malaysia and Singapore through the sea. A boat ride for seven hours will take the produce to Singapore. The area is less accessible by road since it takes long hours of travel.

Marketing of the nuts is done mainly to the processing units in the region and to the traders and exporters operating in the area. The farmers supply their coconuts to the five major factories in the region. Apart from this, billions of coconuts are exported from the region to countries like Malaysia, Singapore, Philippines and Thailand. Many factories in Thailand source more than 90% of their raw material from this region. Farmer price realization is also more in export which has also impacted on the domestic prices paid by the processing units. Exporters also provide immediate payments for the nuts sourced, without delay. Hence farmers are interested to supply to the exporters.

The region has five big factories which undertake integrated processing of coconut and have a total capacity to process more than 50 lakh nuts in a day. PT. Pulau Sambu, commonly called the Sambu Group, the largest integrated coconut processing factory in the world is located in the region. The products of Sambu group include coconut oil, coconut cream, coconut milk, coconut water, desiccated coconut, virgin coconut oil, coconut shell charcoal etc. The factory processes around 25 lakh coconuts a day and has around 18000 employees. The Kara brand of coconut milk and coconut cream produced by Sambu group is available in super markets in India.

Transporting of harvested coconuts from the plantations by floating through the canals.

The other major integrated coconut processing unit in the region is the PT. Inhil Sarimas Kelapa group which produces virgin coconut oil, desiccated coconut, coconut water, coconut milk, activated carbon, coir products etc. Cocomas is the brand name for its main products.

Development programs

The Indragiri Hilir Regency is dedicated to ensure sustained development of coconut in the region. A number of developmental activities targeting the coconut sector are already being implemented. Flooding of the region due to sea water inundation and destruction of the embankments had resulted in severe crop loss in a large area. This was because of lack of maintenance activities of the water management structures when the coconut prices were low. Initiatives have been undertaken for the strengthening of the canal embankments as corrective measures. Efforts are also on in the Regency under the leadership of the Honorable Regent Mr. H. M. Wardan for replanting and rejuvenation of the coconut gardens and introduction of high yielding varieties and expansion of area under coconut.

The Regency took the initiative to organize the World Coconut Day in 2017 wherein investors from around the world were invited. Coconut Festival and Seminar were organized during the event. An exhibition was also arranged with thousands of culinary products from coconut.

The ultimate aim of the Regency is to develop the sector and ensure that all coconuts produced are processed within the region. The Regency has initiated measures to invite investment to the region. This will help in installing adequate infrastructure within the region to process the whole coconut production in the region which will lead to increased returns since the benefits of value addition are realized by the farmers and entrepreneurs in the region. Efforts are also undertaken to improve logistics through expansion of the airport and the seaport. Trade agreements are also initiated with China.

The potentials of coconut in Indragiri Hilir is not fully exploited. The sector holds much promise for development which will directly impact on the social well being of the region. With coconut sector around the globe developing as a sunrise industry, the efforts initiated by the Regency are timely in leading to sustained development of the sector and the millions of coconut farmers in the region. Once the potentials of the region are realized, there will be no looking back. To conclude, we will join them and greet each other with the words - “Salam Kelapa” ■

Progress on coconut micropropagation in Mexico

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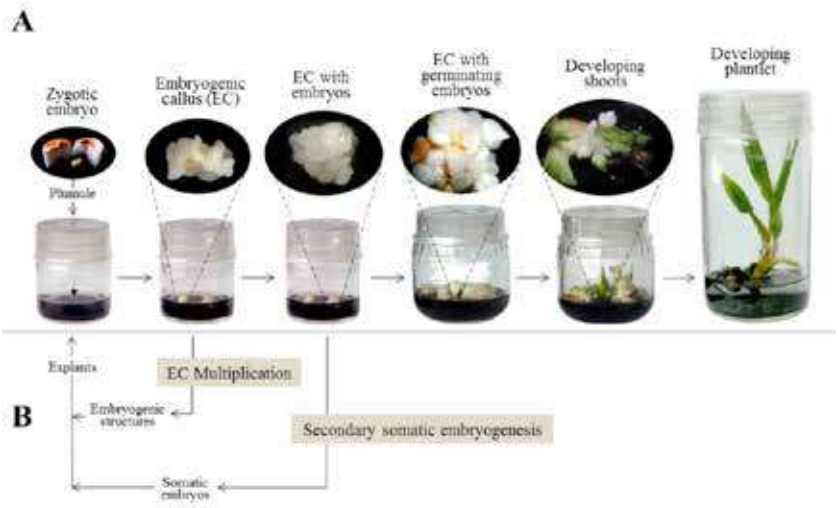
Introduction

The coconut palm has always been a very important species for man. In recent years its commercial importance has been growing very rapidly for different high value products, as in the case of packed coconut water, since it has the potential to substitute worldwide bottled carbonated drinks with a healthier offer. Giant corporations in this field, Coca-Cola, PepsiCo and Dr. Pepper, are already selling packed coconut water products in USA and Europe. According to www.canadeanconsumer.com there will be a fourfold increase (from 2.9 to 10 billion USD) in the coconut water value growth by year 2019.

This increasing growth of the coconut industry markets needs a corresponding growth in nut production worldwide. This is a task difficult to achieve considering the threat of several pests and diseases, and most importantly because most coconut plants in producing countries are old. Regarding phytosanitary threats, perhaps the most worrying are the devastating phytoplasma diseases. In the Americas the phytoplasma associated Lethal Yellowing disease (LY) has killed millions of palms in different countries in the Caribbean region (Fig.1). Therefore, important efforts have been carried out in Jamaica and México to identify LY resistant coconut, which have successfully identified resistant ecotypes in both countries (Oropeza *et al.*, 2005).

Thus in order to maintain the flourishing markets and growing demand of coconut products, replanting of most cultivation surface around the world, as well as establishing new surface, are urgently needed. It is estimated that this immense task cannot be accomplished by traditional propagation through seed. Accordingly, the biotechnological alternative of in vitro propagation by somatic embryogenesis, with its great propagation capacity, has been approached in different laboratories worldwide in order to develop highly efficient and commercially viable protocols. This paper reports an account of such an effort that is currently going on in México at CICY (Centro de Investigación Científica de Yucatán). For more in depth background information the reader is referred to excellent reviews that are available (Arunachalam, 2012; Nguyen *et al.*, 2015; Sáenz-Carbonell *et al.*, 2013).

Figure 1. Lethal Yellowing, the phytoplasma associated disease, has killed millions of coconut palms in the Americas.



> **Thus in order to maintain the flourishing markets and growing demand of coconut products, replanting of most cultivation surface around the world, as well as establishing new surface, are urgently needed.**

Figure 2. Diagram of the process of plant regeneration from plumule explants via somatic embryogenesis (A). Modified process including embryogenic callus multiplication and secondary somatic embryogenesis (A and B).

Materials and Methods

All the materials and methods used for the research reported here are described in Chan *et al.*, (1998), Pérez-Núñez *et al.*, (2006), Sáenz *et al.,* (2006), Pérez-Núñez *et al.*, (2009) Sandoval-Cancino *et al.*, (2016).

Results and Discussions

Development of a protocol using plumule explants

Early studies were carried out during the nineties within a collaboration of Wye College (UK) and CICY (Blake et al, 1994), testing different explants that initially included rachilla and whole embryos for formation of callus (that could eventually form somatic embryos with the capacity to convert into viable plantlets). The callus formation response of these explants was not very convincing, however whole embryos showed the formation of a ring of callus-like tissue growing on the outside middle part of the embryo, although it did not develop into a proper callus. Then considering this response and the probable occurrence of inhibitors of callus formation in some embryo tissues (Kefeli et al., 1971), parts of the embryo were tested separately as explants, including the plumule. Preliminary results showed that plumules were very responsive for callus formation (Blake *et al,* 1994; Hornung, 1995).

Characterization of embryogenic callus development

Within the next decade basic research was carried out to study the process of somatic embryogenesis from plumule explants with different approaches (morpho-histological, physiological, biochemical and molecular) in order to gain knowledge that could be useful to further improvement of the process. In this way, it was learnt about uptake of 2,4-D by explants and the timeline of how its concentration increased (Sáenz *et al*., 2005), followed by increases of kinase activity associated with signal transduction (Islas-Flores *et al*., 2000) and relevant gene expression (Pérez-Núñez et al., 2009; Sáenz *et al*., 2013). At the same time studies were carried out to characterize morphologically and histologically the development of the embryogenic callus (Sáenz *et al*., 2006). It was learnt that the development of this callus is precisely well defined, with the formation of ear-shaped translucid structures that start appearing at about 30 days of culture and are fully formed by day 60. These structures have meristematic cells in the periphery tissues. From these tissues, embryogenic structures develop, first with a globular shape and then they become elongated, and that by day 90 of culture the embryogenic callus is fully developed. The embryogenic structures also have meristematic cells in the peripheral tissues, from which somatic embryos develop after transfer to medium designed to induce

this response. It is interesting that when the translucid structures start forming there had been already a peak in 2,4-D concentration, on kinase activity and in the expression of CnSERK, an ortholog of the SERK gene (Pérez-Núñez *et al*., 2009). Also another peak of CnSERK expression happens by day 90 when the embryogenic structures are formed. A very useful finding was that it is possible to follow the proper development of an embryogenic callus just by looking at its morphology following the right pattern of development in form and time, knowing that the correct changes in tissues, and physiological, biochemical and molecular events are taking place as learnt from the basic studies described above. Once embryogenic calli is subcultured to a medium for inducing somatic embryo formation, globular embryos appeared by day 15 and it developed into torpedo-shaped embryos by day 30. Interestingly, there is a peak of CnSERK activity by day 15.

Figure 3. Scaling up of the process of coconut micropropagation in a facility outside Mérida, Yucatán, with a capacity for up to 200,000 plantlet production per year.

In parallel studies, more practical approaches were tested including changes in the media formulation to study the effect of activated charcoal and brassinosteroids (Azpeitia *et al*., 2003) on plumule explants, and gibberellins (Montero-Cortés *et al*., 2010) and BAP (Montero-Cortés *et al*., 2011) on embryogenic structures used as explants, on the formation of embryogenic callus, somatic embryos and germination, resulting in improved efficiency.

Multiplication of embryogenic callus

The characterization of embryogenic callus, described above, lead us to believe that embryogenic structures and globular somatic embryos could be useful as explants because of the presence of meristematic cells and expression of CnSERK. Therefore they were tried as explants and results were positive for both. These results allowed us to develop processes of callus multiplication / secondary somatic embryogenesis (Pérez-Núñez *et al*., 2006) (Fig. 2B). The first intended for massive multiplication and the second (as an intercalated step within the multiplication) to help conserve embryogenic competence during prolonged culture times (Martinelli et al. 2001). This combined approach was tested with results showing an estimated capacity to produce about one hundred thousand somatic embryos from a single plumule explant (Pérez-Núñez *et al*., 2006). Embryos were able to germinate and convert to plantlets that after planting grew successfully to sexual maturity and fruit production. This protocol is currently being scaled up to a semi-commercial level in a facility we call “Bio-fábrica” or biofactory in Sierra Papacal nearby Mérida in Yucatán (Fig. 3).

Somatic embryogenesis from rachilla explants

Also within the past five years using rachilla explants, a protocol was developed for the production of embryogenic callus and its multiplication, embryos were able to germinate and convert to plantlets (Sandoval-Cancino *et al*., 2016). These results are setting the basis to develop a process for massive propagation of coconut; similar to the one already developed using plumule explants, and using the knowledge gained from the plumule studies.

Conclusion and Perspectives

The transference of the technology for massive propagation based of multiplication of embryogenic callus from plumule is underway and working well, with embryogenic callus and embryo yields as expected, the full process will be working with production of plantlets during the second semester of 2017. There are plans at a later stage, to establish in México larger facilities, probably five. In parallel we are working on the establishment of embryogenic

callus lines of other coconut ecotypes of interest. Keeping these will require cryopreservation, so it is planned to start working on this issue as soon as possible. Also we are already working for developing embryogenic callus lines derived from rachilla explants of very valuable genotypes, and this will be followed by testing them for massive production with a process similar to that used for plumule derived calli. However, it is clear that although results have been very satisfactory so far, for future strengthening of the coconut micropropagation efficiency capacity, it is necessary to keep on working for continuous improvement of protocols. This is something that certainly requires a multi-institutional, international, and very well organized and coordinated effort. ■ ** Reproduced from Cocoinfo International 24 (1), 2017*

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Live Natural & Healthy with Two

Sona John, Sub Editor, CDB, Kochi -11

Finally the original and fresh tender coconut water with its natural taste and flavour has reached the market. Shri. Vinod, an young energetic entrepreneur from Kottarakkara, Kerala is producing and marketing the ready to drink tender coconut water. Vinod is procuring fresh tender coconuts directly from gardens from Kerala and Pollachi and is brought to his mechanized processing plant in Alwaye. The ready to drink product named Two is sold in Kochi and nearby areas.

Tender coconut marketing is one of the most challenging professions according to Vinod. Many brands of tender coconuts are now available in the market. But most of them are pasteurized, added chemical preservatives and is sold in plastic bottles or tetra packs. The problem with most of these brands is that they lack the real taste. The water may not lose its nutrients but during processing, it loses its natural taste. The only advantage is that it can be consumed directly from the sachets or bottles.

More modern technologies like spray dried technology are available in tender coconut processing. Some companies are using this technology and is producing spray dried tender coconut powder which is sold in sachets. This powder can be dissolved in water to make the drink. Since this product is using preservatives, the product is having a longer shelf life.

In both these technologies, the consumer doesn't get the real taste of the tender coconut water. All the products lose its natural taste and flavour when it undergoes processing. It further loses its taste if it is from different variety tender coconuts from different gardens. The Two brand is using an entirely different technology for processing the tender coconuts.

Vinod purchases tender coconut from Pollachi and brings it to his unit at Alwaye, Kerala. He ensures that all the nuts are from the same variety coconut palm. Since all the nuts are of the same maturity, Vinod is able to produce the same quality drink. The nuts are

kept in 60°C and are brought to the plant in 18 hours. The nuts are immediately washed and are cut using the slicer machine. The nut then passes through the conveyor belts and through a modern extraction technology the water is collected, filtered and is stored in the sterilized main steel container. The drink is again UV filtered and freezed at 4°C and is stored in refill tanks. The product is then stored in the chillers kept in various bakeries and hotels. The product is given to the customer in 200 ml glasses @ Rs. 40.

Two tender coconut water is having a shelf life of three or four days or 100 hours. The taste of the drink may change after this period. Hence the company takes back the drink after this period and is producing coconut jelly which is sold @ Rs. 66 per 300 gm. The customer is also given 100gm tender coconut kernel free along with a glass of tender coconut water. The product is packed in very clean good quality plastic container.

The technology of Two is solely developed by Vinod himself. The plant, chiller, steel container etc are designed and developed by Vinod. His wife, a chemistry graduate is also helping him in his ventures. This automobile engineer had initially planned to sell milk through vending machines. But since it was not found to be feasible, he dropped the idea and turned to tender coconut. He made some modifications to the plant and chiller he had developed for milk processing. He further made a detailed study on the pros and cons of tender coconut production and marketing. He visited many tender coconut gardens, had detailed discussion with farmers and ensured the availability of tender coconut.

Initially Vinod plans to install 100 machines in and around Kochi. Tender coconut water will be made available in four liter tanks. The machine will be installed in leading bakeries and hotels. These machines will be cleaned in every twenty four hours using hot water and sodium hypochlorite. This will be done manually. He has already installed around 50 machines in places like Lulu mall, Info Park, Airport etc in Kochi. He has installed GSM controlled real time sales system software in all the machines. The customer will receive 200 ml tender coconut water by swiping the special card given to the shop owner. The information will be simultaneously recorded in the master computer kept in the plant. This enables Vinod to keep himself updated of the stock in various centers.

> **Tender Coconut water is a natural isotonic beverage with the same level of electrolyte balance as we have in our blood. It's the fluid of life, says Mr. Morton Satin, Chief of FAO Agricultural Industries and Post Harvest Management Service.**

Vinod has developed a portable UV system for individual shops and bakers to produce and sell their own tender coconut water. By using this device tender coconut water can be purified and can be put into the vending machine. Thus the original tender coconut water with its real taste can be preserved for 48 hrs. So individual shop keepers, bakers and restaurants can also supply their own tender coconut water by adopting Vinod's technology and make more profit. This system ensures the easy availability of natural tender coconut water everywhere.

In the long run Vinod wishes to install 500 machines in each district. Across India 15000 machines will be installed which will have the capacity to sell 50000 liter tender coconut water per day. Vinod can be contacted @ 9526494595, 9633744193. ■

Is coconut oil a superfood?

Actress Angelina Jolie-Pitt is said to have a tablespoon or so of coconut oil with her breakfast most mornings, while model Miranda Kerr says she not only adds it to salads and smoothies, but she cooks with it and splashes it on her skin as well.

The health claims that swirl around coconut oil are treated with a great deal of scepticism by scientists.

Coconut oil is seen, in the scientific community, as an unhealthy fat. It is very high in saturated fat (86%), even more so than butter (51%) or lard (39%).

The reason that foods rich in saturated fats are frowned on is because eating them causes a rise in blood levels of LDL (low density lipoprotein).

LDL is known as "bad cholesterol" because high levels are linked with increased risk of heart disease.

On the other hand, saturated fats - which are particularly bad for you - also tend to raise HDL, "good" cholesterol, which has the opposite effect. It is possible that a particular food can raise overall cholesterol levels, yet still be heart-friendly.

Cholesterol check

So is coconut oil a cholesterol-busting wonder food, as some claim, or is this all dangerous hype?

Despite all the sound and fury that surrounds coconut oil there have been surprisingly few human studies carried out to test specific health claims.

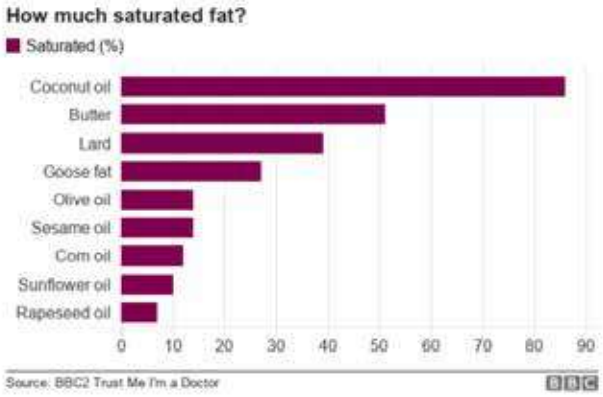
So for the current BBC2 series of *Trust Me I'm a Doctor*, BBC organised a trial.

The Trust Me team started by contacting Prof Kay-Tee Khaw and Prof Nita Forouhi, both eminent Cambridge academics.

With their help recruited 94 volunteers, aged 50-75 and with no history of diabetes or heart disease, and designed a study to assess what effect eating different types of fat would have on their cholesterol levels.

The study team began by randomly allocating their volunteers to one of three groups. Every day for four weeks, the first group was asked to eat 50g of extra virgin coconut oil - that's about three tablespoons full.

The second group was asked to consume the same amount of extra virgin olive oil.



Olive oil is a key element of the Mediterranean diet, which is widely seen as being extremely healthy.

And the third was asked to eat 50g of unsalted butter a day. Again, that adds up to just over three tablespoons.

The volunteers were told that they could consume these fats in whatever way they pleased, as long as they did so every day for the whole four weeks.

They were also warned that, because they were consuming an extra 450 calories a day, they might well put on some weight.

Before volunteers started on their new high-fat regime, blood samples were taken to get baseline measurements, focusing mainly on their levels of LDL (the "bad" cholesterol) and HDL (the "good" cholesterol)

The importance of these two measures is that the heart attack risk is best calculated, not by looking at total cholesterol score, but your total cholesterol divided by HDL score. NHS Choices suggests that this figure should be below four.

> **The main saturated acid in coconut oil is lauric acid and, lauric acid is having different biological impacts on blood lipids compared to other fatty acids**

So what happened? As expected the butter eaters saw an average rise in their LDL levels of about 10%, which was almost matched by a 5% rise in their HDL levels

Those consuming olive oil saw a small reduction, albeit a non-significant drop, in LDL cholesterol, and a 5% rise in HDL. So olive oil lived up to its heart-friendly reputation.

The big surprise was the coconut oil. Not only was there no rise in LDL levels, which was what was were expecting, but there was a particularly large rise in HDL, the "good" cholesterol, up by 15%

On the face of it that would suggest that the people consuming the coconut oil had actually reduced their risk of developing heart disease or stroke.

The research team opined that. Perhaps it is because the main saturated fat in coconut oil is lauric acid and lauric acid may have different biological impacts on blood lipids to other fatty acids. The evidence for that comes mainly from animals, so it was fascinating to see this effect in free-living humans.

So should we be hailing coconut oil as a health food?

Decisions to eat particular oils depend on more than just the health effects. This is just one study and it would be irresponsible to suggest changing dietary advice based on one study, however well conducted."

This was a very short-term study and compared to olive oil, research on coconut oil is at an early stage.

So the claims about coconut oil being a superfood are premature. ■

Source: www.bbc.com

Shri. Radha Mohan Singh inaugurated the Regional Office building of CDB, Patna

The Hon'ble Minister for Agriculture and Farmers Welfare, Government of India inaugurated the Regional Office cum Farmers Training Centre building of Coconut Development Board at Bihar on 27th January 2018.

- **India leads in global coconut production and productivity**
- **Annual coconut production is 2395 crore from 20.82 lakh hectare and the productivity is 11505 coconuts/ hectare**
- **In the year 2016-17, coconut products worth Rs.2084 crore has been exported**
- **In the year 2016, India started exporting coconut oil to Malaysia, Indonesia, and Sri Lanka, the countries from where India was importing earlier**
- **In the year 2014, Rs.409.01 lakh was sanctioned for implementation of coconut related schemes in Bihar through the Coconut Development Board**

Union Minister for Agriculture and Farmers Welfare, Shri Radha Mohan Singh said that the Coconut Development Board's (CDB) major schemes are focusing on increasing coconut production, productivity, processing for coconut products, value addition, marketing, and export promotion. The Minister was inaugurating the Farmers' Training Centre cum Regional Office Building of Coconut Development Board in Patna.

The Minister said that India is leading in global coconut production and productivity. The annual coconut production is 2395 crore from 20.82 lakh hectare and the productivity is 11505 coconuts/ hectare. Coconut contributes to about Rs.27900 crore to the country's Gross Domestic Product (GDP). In the year 2016-17, coconut products worth Rs.2084 crore were exported. More than one crore population depends on coconut cultivation for their livelihood. The aim of Coconut Development Board is to assist the coconut farmers in coconut production, processing, marketing and export of value-added coconut products thereby to make India the global leader in coconut production, productivity, processing, and export.

The Minister added that the country has witnessed an increase in coconut export. During the period 2013 -15, coconut production was 42,104 million nuts whereas 44,405 million nuts were produced during the period of 2015-17. The export value of coconut products has increased from Rs.3017.30 crore during 2011-14 to Rs. 4846.36 crore, which is 60.62% more, which is an achievement. In the year 2016, we started exporting coconut oil to Malaysia, Indonesia, and Sri Lanka, the countries from where we were importing earlier. For the first time, desiccated coconut is being exported to the US and Europe in large quantities from India.

The Minister said that the coconut cultivation can be taken up even in homesteads in Bihar with proper management. Currently, 14,900 hectare is under coconut cultivation. As per the Board's estimation, a nearly 50,000-hectare area in Bihar is suitable for coconut cultivation under irrigated condition. The farmers who are trained at the Farmers Training Centre can consider coconut cultivation. In addition, an increase in coconut production will lead to employment generation. More people will get employment through the production of various coconut based products like coconut chips, coconut milk, coconut sugar, coconut water, tender coconut water, coconut honey, coconut jaggery, coconut milkshake, coconut snacks, virgin coconut oil, coconut natural cream, neera cookies and other products.

The Minister concluded that CDB had sanctioned Rs.409.01 lakh for the implementation of coconut related schemes in Bihar for the year 2014 to 2017. To

increase the area under coconut cultivation in Bihar, the focus is on 'expansion of area under coconut' scheme and financial assistance is being provided under the scheme for the new plantations. For the demonstration of scientific coconut cultivation, Rs. 46.25 lakh has been allocated for the scheme 'Laying out of Demonstration Plot' for the period of 2017-18.

Dr. Prem Kumar, Hon'ble Minister for Agriculture, Government of Bihar in his presidential address underlined the importance of coconut farming in Bihar. Dr. Sanjeev Kumar Chaurasia, MLA , Digha in his address called upon the farmers to come forward and to make use of the various schemes being implemented by Coconut Development Board for the welfare of the coconut farmers in the state. Dr. B N S Murthy, Chairman, CDB delivered the welcome address and Shri. Saradindu Das, Chief Coconut Development Officer proposed the vote of thanks.

In the technical session which followed, Shri. Khokhan Debnath, spoke on Coconut cultivation and CDB schemes in Bihar. In the interactive session, the farmers cleared their doubts on scientific coconut cultivation. Board members, officials and around 500 farmers from across the state took part in the programme. CDB, RO, Patna arranged an exhibition wherein various coconut based products were displayed. ■


राजधानी जागरण
गंगा के किनारे लगेंगे नारियल के पौधे
केंद्रीय कृषि मंत्री ने किया घटना में नारियल विपणन बोर्ड भवन का उद्घाटन किसानों को ट्रेनिंग भी मिलेगी


प्रभात खबर
बिहार में नारियल की खेती को दिया जायेगा बढ़ावा
गंगा के किनारे लगेंगे नारियल के पौधे
युवाओं को मिलेगा रोजगार : राधामोहन
सहारा
राज्य में 50 हजार हेक्टेयर में होगी नारियल की खेती

Centre boost for coconut

M.R. Shankara Narayan Reddy new Vice Chairman of the Board

The 132nd meeting of the Board held in Patna, Bihar on 27th January 2018 elected Shri M.R. Shankara Narayan Reddy as the Vice Chairman of Coconut Development Board. He is representing the farmers from Karnataka in the Board. Shri. Shankara Narayan Reddy, an engineering graduate in Electrical and Electronics is a progressive farmer and is holding the charge of the National study group for Organic Agriculture. His tenure will be for a period of one year.

Parliament Committee on Official Language inspected CDB activities

The second Sub-Committee of the Committee of Parliament on Official Language inspected Head Quarters of the Board on 22nd January 2018 to assess the progressive use of Official Language Hindi in the office. Dr. Prasanna Kumar Patsani, MP(Lok Sabha) the Convenor of the Committee, Dr. Sunil Baliram Gaikwad, MP(Lok Sabha) and Shri. Laxmi Narayan Yadav, MP(Lok Sabha); the members of the Committee were present in the meeting. Dr. B.N.S.Murthy, Chairman, Coconut Development Board and Horticulture Commissioner, Govt. of India, Shri. Saradindu Das, Chief Coconut Development Officer and Smt. Beena S., Assistant Director(OL),CDB attended the meeting. Shri. Susheel Kumar, Assistant Director(OL), Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare represented the Ministry in the meeting. Officers of the Committee, Dr. Satyendra Singh, Sr. Research Officer, Shri. Vikas Verma, Hindi Officer, Smt. Neeraja, Research Assistant and Shri. Abdul Mohib, Assistant were also present in the meeting. Members of the Committee visited the Rajbhasha Pradarshini of the Board.

CII Coconut Festival 2018

FARM TO FRIDGE AND BEYOND

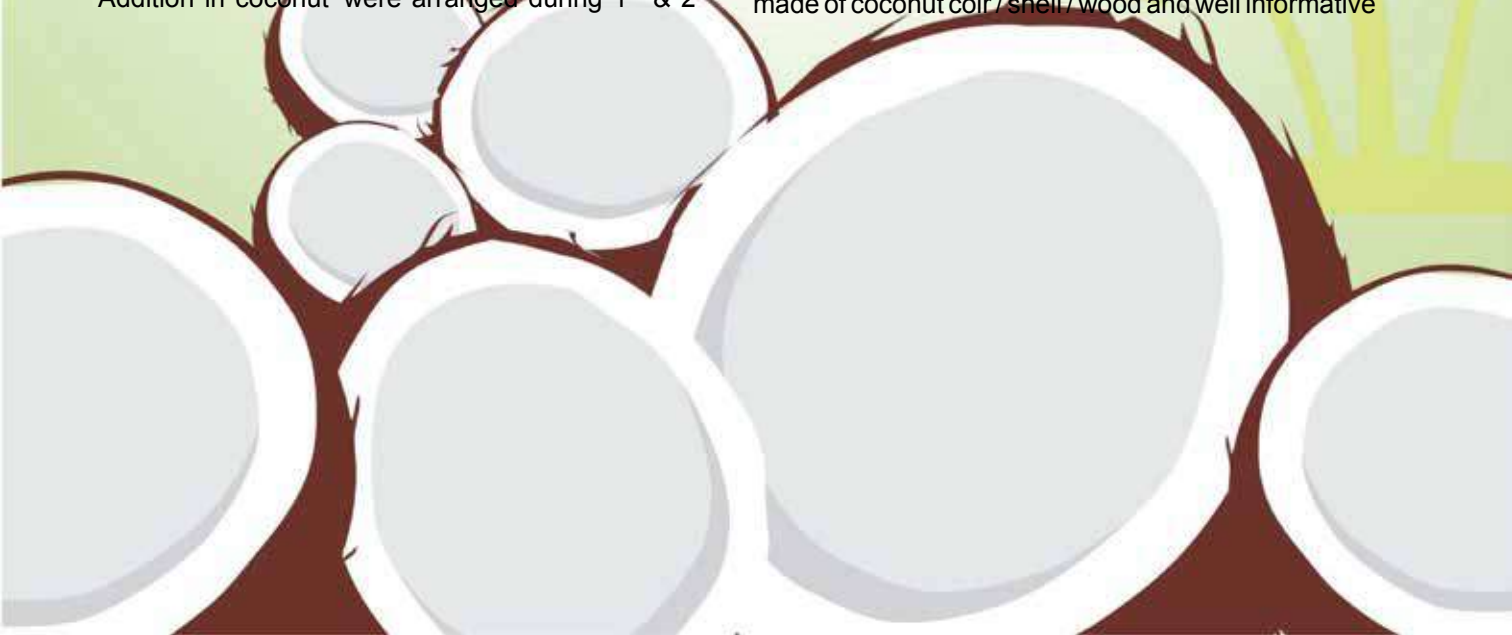
The Coconut Development Board, Regional Office, Chennai participated in Coconut Festival 2018, organized by Confederation of Indian Industries, Coimbatore Zone, from 27th to 28th January 2018, at Codissia Trade Fair Complex, Coimbatore.

The Coconut Festival 2018 was inaugurated by Shri C.P. Radhakrishnan, Chairman, Coir Board in the presence of Shri S.J Chiru, IAS, Principal Secretary & Commissioner, Agricultural Marketing and Agri Business, Govt. of Tamil Nadu, Dr. K. Ramasamy, Vice Chancellor, Tamil Nadu Agricultural University, Dr. P. Chowdappa, Director, ICAR-CPCRI, Dr. C. Anandharamakrishnan, Director, Indian Institute of Food Processing Technology and Shri S. Narayan, Chairman, CII-Coimbatore Zone. Other senior officials of Central & State Government were also present on the occasion. The theme of the coconut festival was “More nuts per tree, more value per nut”.

A two day exhibition & stakeholder conference was arranged during the Coconut Festival. A report on ‘Value Addition Interventions in Indian Coconut Industry’ was released during the inaugural session. Technical sessions on ‘On-field and Off-field Value Addition in coconut’ were arranged during 1st & 2nd day of conference in connection with the Coconut Festival.

In the Coconut Festival 2018, 48 exhibitors participated which included Asian and Pacific Coconut Community, various Central / State Government institutions such as ICAR-Central Plantation Crop Research Institute, Indian Institute of Food Processing Technology, Tamil Nadu Agricultural University & Department of Agricultural Marketing and Agri Business, Government of Tamil Nadu. Leading companies of manufacturing machineries, equipments, input suppliers, and semi processing products related to coconut industry displayed their products in the exhibition.

The Regional Office, Coconut Development Board, Chennai participated in the exhibition. Apart from the display of coconut bunches of different varieties, the Board also displayed various value added coconut products such as tender coconut water, vinegar, nata-de-coco, coconut milk powder, coconut cream, desiccated coconut, virgin coconut oil, neera, neera sugar, neera jaggery, neera honey, neera chocolate, coconut biscuits, coconut candy, coconut shell powder, activated carbon, handicrafts made of coconut coir / shell / wood and well informative



posters, banners, charts. Leaflets, pamphlets and booklets about value addition, scientific coconut cultivation, coconut nursery management etc were also distributed in the Coconut Development Board pavillion. Board's journals in English, Hindi, Tamil and Malayalam and other publications were also distributed during the occasion.

Various manufacturing / coconut producer companies such as M/s. Pollachi Coconut Producer Company Limited, M/s. Coimbatore Coconut Producer Company Limited, M/s. Vinayaka Coconut Producer Company Limited, M/s. Udumalpet Coconut Producer Company Limited, M/s. Madathukulam Coconut Producer Company Limited, M/s. Karpaga Vriksham Coconut Producer Company Limited, M/s. Anamalai Coconut Producer Company Limited, M/s. Vadakara Coconut Farmers Producer Company Limited, Kozhikode, M/s. Palakkad Coconut Producer Company Limited, Muthalamada, M/s. Madhura Agro Process Pvt. Limited, Coimbatore, M/s. Sakthi Coco Products, Pollachi, M/s. Wettree VCO, Pollachi, M/s. Keratech Coconut Oil Manufacturing Company (P) Limited, Trichur and M/s. Dinesh Foods, Kannur participated & displayed their coconut products under Boards banner.

The exhibition had the presence of international and domestic expertise which created a big professional platform for coconut sector. Shri C.P. Radhakrishnan, Chairman, Coir Board along with senior officers of State and Central Government visited the Board's stall and enquired about value added coconut products. More than fifty thousand visitors including farmers from various parts of the country, business communities, officials from various departments State & Central Government, national and international companies visited the Board's stall.

Swedish team visited Onattukara Coconut Producer Company

A team from Sweden led by Mr. Anderson Limas visited Onattukara CPC to learn more in person about the various coconut based products developed by the CPC and appreciated the activities of the CPC. The team tasted various coconut based products like tender coconut water, chutney powder, coconut squash and chips produced by the company. The company had introduced their branded Natural and Premium brand of coconut oil in one of the cooperative societies based in Sweden and the team had the opportunity to get aware of the various medicinal benefits of coconut oil and was impressed by the Natural and Premium brand of coconut oil produced by Onattukara CPC. The team promised to introduce and import various coconut based products of the company in Sweden.

Neera- a hit among Mysuru-Bengaluru road travelers

Neera, the highly nutritious health drink made from the inflorescence of coconut is gaining popularity all over the world as a natural health drink. It is another gift from the coconut tree. Unlike toddy, Neera has amazing health benefits and no alcohol content.

The State Government of Karnataka after realising the health benefits of this drink has issued a final gazette notification on Neera policy. The coconut growers of the state are now permitted to extract neera from their own coconut palms.

Shri. S. N. Siddegowda has opened a Neera Juice Parlour on Mysuru-Bengaluru Highway near Tubinakere village in Nlandya District, which has become a hit among the travelers. More than 60 litres of neera is sold daily sold here @ Rs.15 per glass. The farmers directly supply neera to Siddegowda.

A board highlighting the health benefits of the drink and its nutritional content is displayed in his neera parlour. He has also displayed a certificate from the Central Food Technological Research Institute (CFTRI), which states that neera is not an alcoholic drink, but a nutritional one.

Siddegowda has taken coconut trees on lease at Tubinakere and taps around 100 litre neera per day. Some of the customers visit the coconut farm directly for neera and the demand picks up during weekends.

According to Siddegowda, the struggle of the farmers has yielded results with the Government amending the Excise Act and approving tapping of neera. Tapping neera is a great way to help the coconut farmers who are in distress and also to protect coconut trees.

Source: starofmysore.com

Coconut shell charcoal

Charcoal made from Coconut Shell has so many excellent uses. When converted to activated carbon it is useful in extractive industries. For health uses it is water purification, dental care, oral and internal cleansing with other similar use.

The household use for every rural family is for cooking in place of electricity, gas and firewood to save our forest and save hard-earned family income. Proper charcoal stoves can use same charcoal for days or even a few weeks in the stove before changing over. It does give off much smoke nor does it leave ash dust like firewood so that homes can be cleaner.

A commercial and a good example of simple environment safe design of charcoal stove for home use with Coconut Shell Charcoal. No Smoke. No Ash.

No need for Mothers to do back-breaking work of collecting firewood nor clean around the kitchen too much therefore do less menial tasks to enjoy a much better quality of life.

Awareness programmes on Rugose Spiralling Whitefly infestation in coconut gardens

Being a new whitefly species, the spread of Rugose Spiralling whitefly will be quite rampant initially. To create awareness on spread of Rugose spiralling whitefly in coconut gardens in South India, awareness programmes and field visits were made by ICAR- AICRP on Palms centres in Tamil Nadu and Andhra Pradesh for sensitizing the farming community. Sensitization programme focusing on the natural build of the parasitoid, Encarsia sp. in spiralling whitefly endemic areas was projected as a bio-control strategy.

Tamil Nadu

A joint field visit was made on 12th October 2017 in Rugose spiralling whitefly (RSW) infested coconut gardens with a team involving Mr. Dakshinamoorthy, I.A.S., Director of Agriculture, Tamil Nadu, Mr. Rasu, Deputy Director of Agriculture (Plant Protection), Joint Director of Agriculture (Coimbatopre District), Dr. K. Venkatesan, Professor and Head, CRS, Aliyarnagar, Dr. K. Rajamanickam, Professor of Entomology, Dr. T. Srinivasan, Asst. Professor (Entomology), Asst. Directors of Agriculture, Pollachi (North), Pollachi South and Anaimalai blocks. Various awareness programmes were conducted by CRS, Aliyarnagar since April 2017 in Odayakulam (Anaimalai), Avalappampatti (Pollachi), T.K. Pudur (Pollachi), RRS, Paiyur (Krishnagiri Dt.) and CRS, Aliyarnagar to create awareness about the spread and management strategies of rugose spiralling white fly, in which around 400 farmers participated.

Andhra Pradesh

Awareness meeting on Spiralling Whitefly and its management strategies was conducted at Rollapalem village in a meeting organized by M/s. Krushivala Coconut producer company on 12th January 2018. On 17th January 2018, diagnostic visit was carried out along with Dr. P. Kalidas, Principal Scientist (Entomology), IIOPR, Pedavegi and farmers from Konaseema Region in whitefly infested coconut nurseries in Kadiyapulanka village of East Godavari District and on 19th January 2018 awareness programme was organized by Department of Horticulture and Dr. N.B.V. Chalapathi Rao, Horticultural Research Station, Ambajipeta explained about the management measures to be taken against invasive pest. Awareness programmes were also organized in Kalavapallii village, West Godavari Dist. on 20th January 2018 and Rambilli village, Visakhapatnam Dist., on 5th January 2018.

Report prepared by : T. Srinivasan, N. B. V. Chalapathirao, H. P. Maheswarappa and Jilu V. Sajan
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Banana Festival

Coconut Development Board participated in the National Banana Festival (NBF) 2018 held from 17th to 21th February 2018 at Kalliyoor, Thiruvananthapuram, Kerala. Shri. Radha Mohan Singh, Hon'ble Union Minister for Agriculture and Farmer's Welfare inaugurated the programme.

Shri. Suresh Gopi, MP

Adv. V S Sunil Kumar, Minister for Agriculture, Government of Kerala

Shri. Suresh Gopi, MP, inaugurated the Exhibition which was held as part of NBF 2018. Coconut Development Board displayed various value added products, publications of the Board and informative posters on coconut. Shri. Radha Mohan Singh, Union Minister for Agriculture visited the Board's stall and interacted with the officials of the Board and coconut based entrepreneurs. M/s. Kaipuzha Coconut Producer Company, Kollam, M/s. People's Coconut Producers Federation, M/s. Dinesh Foods, M/s. Keratech and Mr. Prathapan coconut handicraft manufacturer displayed their products and services in the Board's stall. Shri. Suresh Gopi, MP (Rajya Sabha), Adv. V S Sunil Kumar, Minister for Agriculture, Government of Kerala, Shri. O Rajagopal MLA, and Shri. P.R. Muraleedharan, and Shri.Mohanan Master, board members of CDB visited the Board's stall.

Shri. O Rajagopal MLA

Shri.Mohanan Master, Board member

Banana Festival exhibition showcased everything about banana and provided first -hand information to the farmers and general public about its multifaceted uses. Over 200 exhibitors from all over India including Central and State Government Departments, Institutions and Universities, NGOs, Self-help groups and farmer groups displayed their products and services.

The five day festival included a national seminar, training programmes, farmers meet and a host of other activities. The festival provided the opportunity to the participants in building of networking, productive collaborations apart from updating with latest knowledge and trends. The festival was organised by Centre for Innovation in Science and Social action (CISSA) in partnership with Kalliyoor Grama Panchayat and a host of National and State organizations.

MSP for Copra for 2018 Season declared

The Cabinet Committee on Economic Affairs, chaired by the Prime Minister Narendra Modi, approved an increase in the Minimum Support Price (MSP) for Fair Average Quality (FAQ) of Milling Copra to Rs.7500 per quintal for 2018 season from Rs. 6500 per quintal in 2017.

The MSP for FAQ of Ball Copra is increased to Rs.7750/- per quintal for 2018 season from Rs. 6785 per quintal in 2017. The MSP of Copra is expected to ensure appropriate minimum prices to the farmers and step up investment in Coconut cultivation and thereby production and productivity in the country.

The approval is based on recommendations of Commission for Agricultural Costs and Prices (CACP). CACP, an expert body, which takes into account the cost of production, trends in the domestic and international prices of edible oils, overall demand and supply of copra and coconut oil, cost of processing of copra into coconut oil and the likely impact of the recommended MSPs on consumers, while recommending the MSPs.

The National Agricultural Cooperative Marketing Federation of India Limited (NAFED) and National Cooperative Consumer Federation of India Limited (NCCF) would continue to act as Central Nodal Agencies to undertake price support operations at the Minimum Support Prices in the Coconut growing states.

Destination Goa

Coconut Development Board, Regional Office Bangalore participated in Destination Goa- 2018, a mega exhibition from 2nd to 4th February 2018 at Ravinder Bhawan, Mudgaon, Goa. Shri. Narendra Sawaikar MP, South Goa inaugurated the programme. Coconut Development Board exhibited varieties of coconut bunch, posters, value added products of coconut, coconut handicraft and coconut wood based items. Technical queries on scientific coconut cultivation and schemes of the Board were clarified by the officials of the Board. M/s. Keratech (P) ltd. displayed their products and services in the Board's stall

Training programme on coconut cultivation technology at Puri

Coconut Development Board, State Centre, Pitapally, Odisha organized a block level one day training programme on coconut cultivation technology at Puri District on 16th February 2018. Dr. Biswanath Rath, Board Member, CDB delivered the welcome address and Dr.Rajat Kumar Pal, Deputy Director,State Centre,Odisha inaugurated the programme.

In the technical session which followed, Shri. Debdas Dutta, AHO, Satyabadi block spoke on the activities to be undertaken for enhancing coconut cultivation in Puri district. Dr.Rajat Kumar Pal spoke on the schemes of Coconut Development Board with emphasis on LODP. Dr.S.C.Sahoo, Associate Professor and OIC,AICRP on palms, OUAT spoke on coconut cultivation technologies like mother palm selection, seed nut selection, nursery management, scientific way of planting, intercultural operations, integrated nutrient management, integrated pest and disease management in coconut.

Smt Neethu Thomas, Technical Officer, CDB spoke on value addition in coconut and explained about various value added products of coconut like virgin coconut oil, chips, vinegar, desiccated coconut, coconut milk, coir based products, husk based products etc.

During the interactive session, the farmers raised queries on coconut cultivation, CDB schemes, value addition and CPS formation. CDB officials clarified the doubts of farmers. Satyabadi is a traditional and very potential area for coconut cultivation. The one day training programme helped the farmers to gain knowledge on scientific cultivation aspects of coconut, value addition in coconut, schemes of Coconut Development Board etc. More than 65 farmers participated in the training programme. The programme ended with the vote of thanks by Smt. Neethu Thomas.

Kisan Mela

ICAR-Central Plantation Crops Research Institute (CPCRI), Research Centre, Kahikuchi organised Kisan Mela on doubling farmers income through arecanut based cropping system on 19th February 2018 at CPCRI campus Kahikuchi, Guwahati. Coconut Development Board Regional office Guwahati participated in the programme. Around 600 farmers from different districts of Assam attended the programme. Coconut Development Board displayed coconut convenience foods, value added products from coconut kernel, coconut shell & coconut water, coconut shell/wood based handicrafts and leaflets, coconut journal and postures on the nutritional and health benefit of coconut and its products. An interactive session with farmers was held wherein

farmers raised their various queries on coconut plantation and about schemes, Sri. Lunghar Obed, Director, CDB RO Guwahati spoke on CDB schemes implemented in the North East and emphasized on the importance of coconut in Assam in increasing the farmers economy.

Monthly operations in coconut gardens - March

Andaman & Nicobar Islands: Continue watering the nursery. Start collection of seednuts from mother palms. Store them for about one month before sowing. Prepare land for new plantation by removing weeds and cutting down unwanted plants.

Andhra Pradesh: Search for rhinoceros beetles on the crowns of the palms with beetle hook and kill the beetles. Fill the top three leaf axils of the palm with a mixture of 25g sevidol 8G with 250g fine sand. Spray the manure pits with 0.01 per cent carbaryl. Continue irrigation. Collect seednuts from selected mother palms. Release parasitoids if the attack of black headed cater pillar is noticed, particularly in coastal belt. If the palms are infected by scale insects, spray the palms with 0.01 per cent malathion or fenthion.

Assam: Dig isolation trenches of one metre depth and 30 cm width two metres away from the base of the Ganoderma affected palms. Cut down and destroy the affected trunk of dead palms in the garden. If planting pits have not been dug in January or February dig them during this month and fill up with top soil+sand+cow dung manure mixture up to 60 cm for transplanting. After one or two showers, bring the soil to a fine tilth around the palms. Start preparing the nursery beds for sowing of seednuts.

Bihar/Jharkhand: Irrigate the palms. Apply plant protection chemicals to avoid attack of pests and diseases. Repair the irrigation channels. Prepare the land and dig pits of 1m x 1m x 1m size at a spacing of 8m x 8m. Replant/transplant the seedlings in low-lying areas where flood water is a problem. Adopt surface planting if water table is high. Check for the incidence of termite attack, especially in young palms. For the management of termite, adequate soil moisture is a prerequisite. Drench the nursery with 0.05 per cent chlorpyriphos twice at 20-25 days interval. Fill the top three leaf axils of the palms with 25g Sevidol 8G mixed with 250g fine sand to prevent rhinoceros beetle/red palm weevil attack.

Chhattisgarh: Irrigate the palms, nursery and inter crops in the garden. Remove weeds from the garden. Plough the land and mulch the basins. Plant summer vegetables and other intercrops. Apply vermi compost to coconut palms.

Karnataka: Irrigate the garden. Give 70-80 litres of water per palm per day under drip irrigation. Plant suitable intercrops under irrigated conditions. Check the attack of rhinoceros beetle. Clean the crowns of the palm and fill top 3 leaf axils of the palms with a mixture of 25g sevidol with 200 gm fine sand. Fill the leaf axils with two naphthalene balls covered with fine sand at 45 days interval. Treat manure pits and other possible breeding sites of rhinoceros beetle with carbaryl (0.1 per cent) which is to be repeated in every three months. Spray 1 per cent bordeaux mixture against leaf spot. Adopt integrated control measures against the attack of leaf eating caterpillar. Release parasitoids of suitable stage immediately after noticing the infestation and subsequently three times at fortnightly intervals. For tall plants and large

orchards a combination of biological and chemical methods are suggested. If the attack of mite is noticed, spray neem oil formulation containing 0.1 per cent Azadirachtin / Neemazal@ 4 ml/ litre of water. The spray droplets are to be directed towards the second to fifth immature bunches. In order to improve the nutrient status of the soil grow green manure crops like daincha in the basins of the palms and incorporate into the soil within 45 days. Apply organic manure @ 25 kg/ tree/year. Provide neem cake @5 kg / tree/year.

Kerala/Lakshadweep : Continue irrigation. Continue collection of seednuts from selected mother palms and store them in a cool dry place. Apply one fourth of the fertilizers in irrigated gardens. If the attack of mite is noticed, spray neem oil formulation containing 0.1 per cent Azadirachtin / Neemazal@ 4 ml/ litre of water. The spray droplets are to be directed towards the second to fifth immature bunches.

Maharashtra/Goa/Gujarat: Undertake hoeing in the garden. Remove the grasses and shrubs and burn them. Check for attack of pests/diseases and take appropriate steps to control them. Ensure irrigation. Start collection of seednuts for raising seedlings.

Odisha: Irrigate the palms. Remove weeds from the garden. Mulch with dry coconut leaves and coirpith for moisture conservation. Collect seednuts from selected mother palms and store them in cool and dry place. Spray the palms affected by leaf eating black-headed caterpillar with 0.02% dichlorvos or malathion 0.05 per cent. Repeat the spraying after an interval of 15 days if the attack is severe. Before spraying, cut down the affected leaves and burn them to prevent further infestation. Alternatively liberate parasites of black-headed caterpillar on the affected palms after 15 days of spraying. Palms on which the parasites have been released should not be sprayed with insecticides as it will kill the parasites also. If the attack of mite is noticed, spray neem oil formulation containing 0.1 per cent Azadirachtin / Neemazal@ 4 ml/ litre of water. The spray droplets are to be directed towards the second to fifth immature bunches.

Tamil Nadu/Puducherry: If the attack of mite is noticed, spray neem oil formulation containing 0.1 per cent Azadirachtin / Neemazal@ 4 ml/ litre of water. The spray droplets are to be directed towards the second to fifth immature bunches. Spraying has to be done especially on the perianth region of buttons and affected nuts. Wherever spraying is difficult root feeding may be done with Azadiractin 50%

formulation 7.5 ml in 7.5 ml water. Continue irrigation. Treat manure pits and other possible breeding sites of Rhinoceros beetle with 0.01 per cent carbaryl to control grubs. Continue collection of seednuts from selected mother palms and store them in a cool dry place.

Tripura: Irrigation should be continued and the frequency of irrigation should be based on the quantum of rainfall received. Regular irrigation will improve the production of bearing plants.

West Bengal: Continue irrigation. Apply 200 litres of water in basin twice a week depending upon moisture retention capacity of the soil. If drip irrigation is adopted give 70 to 80 litres of water per palm per day. Provide proper shade to newly young seedlings. Mulch the basins with coconut husk, green leaves, dried coconut leaves in 3 to 4 layers or spread coir pith in six-inch layer for moisture conservation. Harvest mature nuts. Collect the seednuts from the selected mother palms, which are regular bearers and have an annual yield of hundred nuts and above. Store the collected seednuts in shade. Check for the attack of rhinoceros beetle (triangular cuttings in new spindle leaves). Hook out the beetles from affected palms. Clean the crowns of the palms and fill the top most axils of the palms with 25g sevidol 8G with 250g fine sand at 45 days interval. Treat manure pits once every three months with carbaryl (0.1 %). If bud rot is noticed remove all the affected portions. Treat the wound with Bordeaux paste or paste of Blitox. Spray the crown with Blitox @ 5g per litre of water or Dithane M 45 @ 2 g per litre of water. To manage eriophyid mite infestation, spray the crowns with 0.1 per cent Azadiractin (Neemazal) @ 4.0 ml per litre of water. The spray droplets are to be directed towards the second to fifth immature bunches. Alternately, root feeding with 7.5 ml of Neemazal (5%) dissolved in 7.5 ml of water can also be done. Plough the interspaces and destroy weeds. Grow summer vegetables and flowers like marigold as intercrop.

Market review – January 2018

Domestic price

Coconut Oil

During January 2018 the price of coconut oil opened at Rs.20400 per quintal at Kochi and Alappuzha markets and Rs.22000 per quintal at Kozhikode market. The price movement in Kochi market and Alappuzha market expressed an overall downward trend whereas in Kozhikode market price the expressed an upward trend during the month.

The price of coconut oil closed at Rs.19800 per quintal at Kochi and Alappuzha markets and Rs.22100 per quintal at Kozhikode market with a net loss of Rs.600 at Kochi and Alappuzha markets and net gain of Rs.100 per quintal at Kozhikode market.

The price of coconut oil at Kangayam market in Tamilnadu, which opened at Rs.19133 per quintal, expressed a mixed trend and closed at Rs.18333 per quintal with a net loss of Rs.800 per quintal.

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

	Kochi	Alappuzha	Kozhikode	Kangayam
01.01.2018	20400	20400	22000	19133
07.01.2018	20400	20400	22200	18667
14.01.2018	20100	20100	22000	18333
21.01.2018	20000	20000	22100	18333
28.01.2018	20000	20000	22100	18333
31.01.2018	19800	19800	22100	18333

Milling copra

During the month, the price of milling copra opened at Rs.14300 per quintal at Kochi, Rs.13400 per quintal at Alappuzha and Rs.14400 per quintal at Kozhikode market. The price movement in Kochi market and Alappuzha market expressed an overall downward trend whereas in Kozhikode market the price expressed an erratic trend during the month.

The prices closed at Rs.13700 at Kochi, Rs.13050 per quintal at Alappuzha market and Rs.14450 at Kozhikode markets with a net loss of Rs.600 per quintal at Kochi and Rs.350 per quintal at Alappuzha market and net gain of Rs.50 per quintal at Kozhikode market.

At Kangayam market in Tamilnadu, the prices opened and closed at Rs. 12900 per quintal.

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

	Kochi	Alappuzha (Rasi Copra)	Kozhikode	Kan-gayam
01.01.2018	14300	13400	14400	12900
07.01.2018	14300	13400	14400	13000
14.01.2018	14000	13200	14200	12800
21.01.2018	13900	13150	14500	12800
28.01.2018	13900	13150	14500	13000
31.01.2018	13700	13050	14450	12900

Edible copra

The price of Rajapur copra at Kozhikode market which opened at Rs.15300 per quintal expressed a mixed trend during the month and closed at Rs.14400 per quintal with a net loss of Rs.900 per quintal.

Table3 :Weekly price of edible copra at Kozhikode market (Rs/Quintal)	
01.01.2018	15300
07.01.2018	15100
14.01.2018	14700
21.01.2018	14800
28.01.2018	14400
31.01.2018	14400

Ball copra

The price of ball copra at Tiptur market which opened at Rs.13550 per quintal expressed a mixed trend during the month and closed at Rs.13400 per quintal with a loss of Rs.150 per quintal.

Table 4 : Weekly price of Ball copra at major markets in Karnataka (Rs/Quintal)	
	Tiptur
01.01.2018	13550
07.01.2018	13000
14.01.2018	13400
21.01.2018	13500
28.01.2018	13400
31.01.2018	13400

Dry coconut

At Kozhikode market, the price of dry coconut opened at Rs.10200 per quintal. The price expressed an upward trend and closed at Rs.9650 with a net loss of Rs.550 per quintal.

Table5 : Weekly price of Dry Coconut at Kozhikode market (Rs/1000 coconuts)	
01.01.2018	10200
07.01.2018	9950
14.01.2018	9950
21.01.2018	9750
28.01.2018	9750
31.01.2018	9650

Coconut

At Nedumangad market the price of partially dehusked coconut opened at Rs. 22000 and closed at Rs. 20000 with a loss of Rs.2000 per thousand nuts. At Pollachi market in Tamil Nadu, the price of coconut opened at Rs. 20000 and closed at Rs.19000 per thousand nuts with a net loss of Rs.1000 per thousand nuts. At Bangalore APMC, the price of partially dehusked coconut opened at Rs. 18000 and closed at Rs. 17500 with a loss 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.25000 per thousand nuts.

Table 6: Weekly price of coconut at major markets (Rs /1000 coconuts)				
	Neduman-gad	Pollachi	Banglore	Mangalore (Grade-1)
01.01.2018	22000	20000	18000	25000
07.01.2018	22000	20000	18000	25000
14.01.2018	22000	19000	18000	25000
21.01.2018	22000	19000	17500	25000
28.01.2018	22000	19000	17500	25000
31.01.2018	20000	19000	17500	25000

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)	
01.01.2018	10000
07.01.2018	10000
14.01.2018	10000
21.01.2018	10000
28.01.2018	10000
31.01.2018	10000

International price

Coconut oil

The international and domestic price of coconut in Indonesia and India expressed a downward trend during the month whereas the Philippines domestic market expressed an erratic 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 January 2017				
	International Price(US$/MT)	Domestic Price(US$/MT)		
	Philippines/ Indonesia (CIF Europe)	Philippines	Indonesia	India*
06.01.2018	1458	1408	1410	3149
13.01.2018	1447	1422	1410	3102
20.01.2018	1410	1369	1362	3087
27.01.2018	1380	1343	1345	3087
				* 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 January 2017				
Date	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India*
06.01.2018	225	210	447	309
13.01.2018	224	210	447	293
20.01.2018	222	203	447	293
27.01.2018	216	200	447	293
				*Pollachi market

Copra

The domestic price of copra at Philippines, Indonesia and India expressed an overall downward trend whereas the price of copra in Srilanka expressed a slight upward trend during the month. The price of copra quoted at different domestic markets is given below.

Table 9: Weekly price of copra in major copra producing countries during January 2017				
	Domestic Price(US$/MT)			
	Philippines	Indonesia	Srilanka	India*
06.01.2018	900	750	1520	2207
13.01.2018	910	750	1520	2161
20.01.2018	881	749	1528	2145
27.01.2018	831	749	1546	2145
				* Kochi Market