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Message from the Chairperson's desk

Dear Readers,

We are all concerned that the current pandemic situation has very badly affected the agriculture sector of the country.

Disruption of the supply chain, reduced exports and the issues in transportation due to lockdown has impacted the marketing of coconut products. Prices have also fallen down and many states are in the process of requesting for procurement support under the Price Support Scheme.

It may be noted that the Government of India has declared Minimum Support Price of Rs. 9,960/- per quintal for Milling Copra and Rs.10,300/- per quintal for ball copra for 2020 Season which will be a relief for the small holder coconut farmers. Further the government has also announced relief packages for the industry especially the MSME sector. We hope that coconut processing industries will be able to make use of these assistances extended by the government.

Government of India has brought out ordinances for supporting marketing of agricultural products during this pandemic situation. It is hoped that with the help of these initiatives the coconut sector may be able to tide over the crisis.

Let us strive together to mitigate this crisis and look forward to a better future.

G Jayalakshmi IAS

Chairperson

Coconut in Maharashtra

Interventions of RCRS, Bhatye

V.V. Shinde, H.P. Maheswarappa, S.L. Ghawali and S.M. Wankhede
All India co-ordinated Research Project on Palms and Regional Coconut Research Station, Bhatye. Ratnagiri

Coconut occupies a vital position in coastal agriculture, which has great economic significance by way of its contribution to food and nutritional security in the country.

Coconut sector in Maharashtra

Maharashtra occupies the 7th place in area and the 9th place in production with the annual production of 209.87 million nuts. Over a period of 33 years from 1986-87 to 2018-19, the area under coconut has increased from 6900 ha to 43320 ha and production from 76.32 million nuts to 209.87 million nuts. The maximum area under coconut is in Sindhudurg district followed by Ratnagiri.

District wise Area, Production and Productivity of Coconut in Maharashtra State

Sr. No	Districts	Area (ha)	Production (Lakh nuts)	Productivity (Nuts/ha)
1	Sindhudurg	17929	1457.0	4845.0
2	Ratnagiri	5556.0	406.0	
3	Raigad	2248	107.0	
4	Thane	1161.7	8.0	
5	Palghar	1473.9	16.0	
6	Other	14852	96.0	
	Total	43320	2098	

Regional Coconut Research Station, Bhatye

The Regional Coconut Research Station, Bhatye was established on 1st July 1955 by the Indian Central Coconut Committee and administratively controlled by the State Department of Agriculture. With the formation of the State Agriculture University, the administrative control was taken over by the Mahatma Phule Krishi Vidyapeeth, Rahuri on 3rd June 1969. The administrative control now rests with Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth since its inception on 18th May, 1972. Initially it started with central assistance from the Indian Central Coconut Committee and the State of Bombay on 50:50 basis. Since 1970 the station was fully financed by the Indian Council of Agricultural Research (ICAR) New Delhi under the scheme, All India Co-ordinated Coconut and Arecanut Improvement Project. Later in 1972 it continued operating on 75: 25 basis by the ICAR and the Govt of Maharashtra, respectively.

The Research Station is situated on the coast of the Arabian Sea on the western outskirts of village Bhatye and linked with the southern borders of city Ratnagiri by the Bhatye creek-bridge on the mouth of river Kajali. The total area of the research station is 25.84 ha with area under cultivation of about 22.50 ha and the remaining area is nursery, road and buildings.

Konkan region of Maharashtra is a long narrow strip of 720 kms, running North to South along the West coast of Maharashtra. The region comprises of Thane, Raigad, Ratnagiri, Sindhudurg and Greater Mumbai districts. It is characterized by hilly terrain receiving heavy rainfall ranging from 3000 to 4000 mm per annum usually during four months from June to September. The climate is warm and humid almost throughout the year.

Present scenario of coconut

It is very clear that the area under this crop in Maharashtra is increasing rapidly and the tendency of planting coconut in non-traditional area is increasing over a period of time. During the last year, due to increased and extended monsoon, high moisture content and less sunshine hours, the crop failed to produce the spadix in the months of September to December. Hence little reduction in the yield was experienced.

Problems of coconut cultivation in Konkan region
Fragmented holding
Scattered production
The homestead nature of cultivation
Lack of skilled manpower for climbing and harvesting.
Incidence of pest and disease especially Rugos spiralling white fly spreading rapidly in Konkan region and across.
Unorganised marketing of nut and other products.
Lack of appropriate mechanisation for harvesting
Lack of adoption of scientific cultivation practise.

Coconut pest status during 2019-20 in the Konkan region

The coconut pest attack of Rhinoceros Beetle(RB), Red Palm Weevil (RPW), Rugos spiralling white fly (RSW) and Black headed caterpillar (BHC), was studied in five districts of the region. It was observed that the infestation of RB was noticed in all palms irrespective of age. The maximum incidence of 8.86 percent was noticed in Sindhudurg district.

The incidence of RPW was observed more (0.86 percent) in Raigad district. However, the Rugos spiralling white fly incidence was observed in all the districts of Konkan region. The maximum incidence was found in Sindhudurg district (13.51%). The intensity of RSW was in the range of 3.45 to 5.27%. The highest was recorded in Palghar district of Maharashtra.

Variety released from AICRP on palm centre Bhatye, Ratnagiri

The total germplasm strength of coconut of this centre is 48 genotypes of which 17 are exotic. From this strength, the centre has released the following two varieties.

▶ *1) Pratap*

This is section from WCT (Green Round Banavali) flowering during 6-7 years. The average nut yield is 140-145 per palm/year, with oil per cent of 68%. This variety is popular in Maharashtra and was developed during 1987.

▶ *2) Konkan Bhatye coconut hybrid 1 (GBGD x ECT)*

This is a hybrid variety released during 2007. It takes 4.5 to 5 year to start flowering. The average nut yield is 120-122 with 67.1% oil percentage.

Soil Health Management

We know that coconut palm is a perennial crop which bears nut for more than six to seven decades after the commencement of flowering. Sound health management strategies is adopted to ensure sustainable yield. A fertilizer dose of 1000 g nitrogen, 500 g phosphorus and 1000 g of potash per palm per year in three splits (June, October and February) is recommended for coconut cultivation in sandy soils of the Konkan region of Maharashtra state.

Fertilizer requirement for Regular varieties					
Sr. No.	Age	Quantity of FYM kg/ palm	NPK kg/palm/year		
			N(g)	P2O5 (g)	K2O (g)
1.	1st	10	200	100	200
2.	2nd	20	400	200	400
3.	3rd	30	600	300	600
4.	4th	40	800	400	800
5.	5th	50	1000	500	1000

B) Fertilizer requirement for hybrid palms

On the basis of cumulative yield and economics the following dose was recommended for hybrid coconut palms as shown in the table below.

Fertilizer requirement for hybrid coconut					
Sr. No.	Age of the palms	Quantity of FYM kg/ palm	NPK kg/palm/year		
			N(g)	P2O5 (g)	K2O (g)
1.	1st	10	200	100	400
2.	2nd	20	400	200	800
3.	3rd	30	600	300	1200
4.	4th	40	800	400	1600
5.	5th	50	1000	500	2000

▶ *C) Fertilizer application through micro-irrigation technique*

Application of 1 kg N, 0.5 kg P2O5 and 1 kg K2O per palm per year (recommended dose) is recommended through drip irrigation in eight splits from October to May.

▶ *D) Micronutrient application*

Application of recommended dose (1:0.5:1 Kg NPK/palm/year) with 1.5 Kg Ormichem Micronutrient complex (Zn 3.15 %, Mg 1.8 %, Cu 0.65 %, Fe 1.97 %, Mn 2 %, Mo 0.05 % and B 0.68 %) recorded the maximum yield (129 nut/palm/year) in coconut and also the percentage increase in yield was higher in post treatment period yield when compared with pre-treatment period yield.

Therefore the application of recommended dose of fertilizer with 1.5 Kg Ormichem micronutrient in three splits is recommended for adult coconut palm.

Irrigation Management

▶ *a) Effect of water quality on survival and growth of coconut seedling*

An experiment was conducted to assess the influence of quality of irrigation water on growth of one year old newly planted West Coast Tall coconut seedling in coastal sandy soil. Irrigation with sea water had detrimental effects, at any growth phase throughout the duration of the experiment, due to primary salt stress, which was responsible for membrane disintegration and disturbance in metabolic process. The dilution of seawater with sweet water reduced the extent of primary stress injury but imposed salt injury causing decrease in uptake of mineral elements, which resulted in the poor growth of seedling.

b) Irrigation to coconut palms by drip method

The drip irrigation with 30 litres water /palm/ day during October and January and 40 liters during from February to May with six drippers placed at a distance of 1.25 m. away from the bole in the sandy loam soils of Konkan region is recommended for adult coconut palm.

c) Fertilizer application through micro- irrigation technique in coconut

For better growth and yield in palm , application of recommended dose 1 kg N, 0.5 kg P2O5 and 1 kg K2O per palm per year is recommended through drip irrigation in eight splits from October to May.

Coconut based Cropping System

▶ *a) Intercropping of chilli in coconut*

The cultivation of Chilli (variety "Jawala" and "Konkan Kirti") is recommended due to the higher yield and best net return as inter crop in coconut orchard.

▶ *b) Intercropping of vegetables in coconut*

On the basis of economic return obtained per man days per hectare, Dolichus bean could be rated as the most remunerative vegetable crop, whereas tomato cultivation provided better employment opportunities and gave attractive yield.

▶ *c) Intercropping of rainfed vegetables in coconut*

Rainfed vegetables such as ridge gourd, cucumber, snake gourd and bitter gourd are recommended in coconut plantation during rainy season.

▶ *d) Mixed cropping of spices in coconut*

The excellent growth and good bearing capacity of cinnamon, nutmeg, black pepper and clove planted in coconut as intercrops proved that these crops can be cultivated on a commercial scale in the Konkan region of Maharashtra.

It is also recommended that by planting spice crops as intercrop in coconut plantation, the average yield of coconut per palm has increased from 25 to 93 percent at the end of 26th year as compared to the average yield of previous four experimental years.

A study conducted during 2006-07 revealed that nutmeg (of 22 years age) proved as the best intercrop in coconut plantation. Nutmeg and coconut together gave Rs. 93,578/- as net return per hectare whereas coconut as a monocrop recordingly a net net profit of Rs. 25,987/- per hectare. On the basis of the net economic returns released, it is recommended to interplant nutmeg, cinnamon and clove in well spaced coconut garden in the Konkan region of Maharashtra state.

Concept of increasing farmer's income through cropping system approach (HDMCS)

The regional coconut research station Bhatye, has propagated the 'Lakhi Baug' concept, the intercropping of spices particularly Cinnamon, Nutmeg and Black pepper in coconut orchard. From one acre of this type of system, a farmer can get one Lakh rupees and this system is called 'Lakhi Baug' which includes different models.

▶ *Economics of HDMSCS*

Treatment	Cost of cultivation	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C
HDMSCS	105185.2	283456	131605.8	2.69
Monocrop	63639.0	102374	38735	1.60

Converting waste to wealth

Coconut palm is truly a 'Kalpvraksha' because the large quantities of biomass residues produced can be recycled and used for improving soil, plant and human health. Approximately 18.5 MT of recalcitrant biomass waste is produced annually from coconut palm which can be converted to wealth. The earthworm is related (*Eudrilas sp*) and is being used for converting phenol and lignin rich coconut leaves in to granular vermicompost. Two and half months are required to convert coconut material to vermicompost. The output is 3500 kg from 175 palms.

Area Expansion Programme

Since 1990, the Government of Maharashtra has launched the Employment Guarantee Scheme (EGS) for a number of horticultural crops which includes coconut plantation also. During 1990, the area under coconut was 8300 hectares, which increased to 43320 hectares during 2018-19.

The Regional Coconut Research Station, Bhatye Ratnagiri during the last 65 years has developed and recommended many varieties and standardized a number of package of practices. This has helped in increasing the area in the region as follows.

Area expansion

No.	Year	Area expansion (ha)	Increase over previous (ha)	% Increase
1	1990	8300	-	-
2	2000	12400	4100	49.39
3	2010	21670	9270	74.75
4	2020	43320	21650	99.90
	Total area increased over 1990	35020		

	Seed/ planting material supplied from the Centre		
No.	Year	Seedling supplied	Seed nuts Supplied
1	2009-10	17344	29600
2	2010-11	16346	23200
3	2011-12	17951	21500
4	2012-13	22426	27340
5	2013-14	26226	30050
6	2014-15	31248	31000
7	2015-16	33164	36500
8	2016-17	33244	42000
9	2017-18	36339	56000
10	2018-19	34538	68000
11	2019-20	37656	73000
	Total	273238	438190

Out of the seed/planting material supplied from the centre, if 80% survival is considered, we can estimate 218000 seedlings which covers 1250 ha. under coconut cultivation and if 40% nuts are considered as saleable materials it can bring 1002 ha under coconut cultivation thus making the total area under coconut cultivation to 2252ha during the last decade which is under the perview of the station.

Encouragement for establishing sales counter for tender coconut water in Konkan

Tender coconut water is rich in vitamins, minerals and electrolytes. There is great demand from the public for this natural drink due to the electrolyte lost from the body due to over exertion and sweating. The centre is giving guidance and other neccessary trainings to prospective, entrepreneurs to establish tender coconut units.

Sr.No.	District	Quantity sold
1	Ratnagiri	200000
2	Sindhudurg	150000
3	Raigad	100000
4	Thane	400000
5	Palghar	500000

These units are located near big and famous temples, tourist places, central market, hospitals and sea beaches where it can be easily sold. The average sales rate is Rs.30/nut

Public & private Nurseries in the region			
District	Public	Private	Seedling produced during 2019
Sindhudurg	06	09	7830
Ratnagiri	11	08	31890
Raigad	03	06	2200
Palghar	04+1*	05	24000
Total	24	28	65920

CDB, DSP Farm Nursery at Dapoli, Dist- Palghar (MS) to whom RCRS, Bhatye is supplying seed material regularly@10000 nuts per anum since 2016.

Coconut processing units in the region

This station and CDB is jointly helping to establish coconut processing units in the region. Timely guidance is given to taking help from CPCRI, Kasaragod also.

Sr. No.	Units	Sindhudurg	Ratnagiri
1	VCO	01	02
2	COIR	5+1*	01
3	Dried Copra	01	-
4	Desiccated copra	01	-

This centre through various special days celebration, weekly advisory, need based moble contact, kisan mela and television and Radio programmes has been giving advisory to the farmers of the region.

Extension activities

Following various on farm extension activities were conducted.

Sr. No.	Types of training conducted	Numbers	Partici-pants
1	Training to extension functionaries	33	519
2	Rural youth (Ratnagiri, Rajapur,Lanja tahasil)	129	7016
3	SHG (Bachat gats)	24	654
4	Special day celebration (Coconut,Soil,Forest,-Woman and Food day)	17	524
5	Bee keeping	2	66
6	FOCT	6	118
7	Demonstrations	11	852

Mechanized harvesting, an effort of DBSKKV, Dapoli

The continuous increase in the yield and production rate of coconut orchards has urged the need for mechanization of coconut harvesting in India. The average yield, production and area of coconut is increasing since the last thirty four years. The drudgery in manual coconut harvesting, lack of climbing labours and the operational and safety problems in availing manual climbers have necessitated the need for the mechanization of coconut harvesting. Coconut growers are facing practical difficulty in coconut harvesting due to the height of the tree. The tractor mounted hydraulic elevator (TMHE) develoed by Dr. B.S. Konkan Krishi Vidyapeeth Dapoli is a fully automatic harvesting device for harvesting tall coconut orchard. The further development and testing of this elevator is in progress. The coconut harvesting capacity of TMHE is observed as 4524 coconuts/day.

Important features of the hydraulic climber

1) The tractor Mounted Hydraulic Elevator is suitable for harvesting of coconut up to a maximum height of 14 meters using traditional harvesting pole.

2) It takes very less lifting and lowering time for coconut harvesting spraying and cleaning operation.

3) The machine can be operated by any agricultural worker with training.

4) The efficiency of this machine is much more compared to manual harvesting

Coir industries in Maharashtra

Maharashtra occupies 7th place in area and 9th place in coconut production with the annual production of 209.87 millon nuts. It occupies 1.99%

Government declares Minimum Support Price for Mature Dehusked Coconut

Government of India has declared Minimum Support Price for mature dehusked coconut for the season 2020 at Rs. 2700/- per quintal, thus hiking the MSP by 5.02% from Rs. 2571/- per quintal during season 2019.

Union Minister of Agriculture & Farmers' Welfare, Rural Development and Panchayati Raj Shri Narendra Singh Tomar said that the Government of India under Prime Minister Shri Narendra Modi has given utmost importance to the interests of farmers growing all kinds of crops throughout the country. The hike in the MSP for mature dehusked coconut facilitates procurement of fresh coconut thereby ensuring that the benefit of MSP reaches the millions of smallholder coconut farmers.

Shri Tomar said that coconut being a small holder's crop, aggregation and arranging copra making facility at farmer's level is not common. Even though MSP for milling copra is Rs. 9960/- per quintal for 2020 crop season, declaration of higher MSP for dehusked coconut ensures immediate cash to the small farmers, who are unable to hold the product and who are having insufficient facility for copra making. This will be a relief to the coconut farmers who are already affected by the pandemic and the consequent disruption in the supply chain. *Source: https://pib.gov.in/*

share in area and 0.98% share in production. The average productivity is 4845 nuts/palm/year (*175 palms/ha), which is 28 nuts per palm/year. The total nut production of Maharashtra is 209.87 million nuts (20.09cr nuts).

Estimation of husk production

The average husk production of West Coast Tall (Banawali variety which is commonly grown) is 216 gm per nut. Hence total husk production from 209.87 million nuts would be 45331 tonne. A small processing unit requires 1000 kg husk per day as raw material.

The status of coir industry in Maharashtra

Maharashtra has a coastline of about 720 km. Coconut is predominantly grown in the coastal belt especially in Sindhudurg and Ratnagiri districts of Konkan region alongwith other parts of the state. The annual availability of coconut husk is about 45000 MT. An increasing trend is observed in coconut production. Coir industry of the state is at fledgling stage with an estimated husk utilization of only 1% much below the national average.

Reasons for non availability of husk for coir purpose

1. Unorganised sector of coconut marketing

Marketing of nut is not centrally sponsored, no hubs with no co-operative market sectors which hinders the availability of husk from a single point.

2. Under utilization of husk for productive purpose

Most of the nuts are being utilized for domestic purpose and whatever husk obtained is used for fuel purpose and for smudging purpose (mosquito

repellent smoke). A small quantity is used for composting purpose by the farmer.

3. High cost involved in collection and storage

Though it can be made available, the bulky nature of produce requires more cost for collection, loading and transportation rather than actual cost of produce

4. Limiting factor for husk collection

The small garden size and sporadic nature of the garden are other limiting factors of husk collection.

5. Lack of awareness about importance of husk and its use

6. No proper marketing channel for husk

Tourism and Coconut

Tourism and coconut has a very strong bonding in attracting people. It has been estimated that the tourism industry is growing at the rate of 4% a year. However the Maharashtra tourism is growing at a higher rate.

	Tourist places in Konkan		
No.	**District**	**Sea beaches (no)**	**Tourist unit (no)**
1	Sindhudurg	24	4.0
2	Ratnagiri	36	6.0
3	Raigad	32	10.0
4	Thane	02	3.0
5	Palghar	16	12.0

Coastline belt along with coconut plantation adjacent to see shore are now the prime spots for tourism. Most of the AICRP centres are also located on beach which is an attraction for tourism. ■

Coconut cultivation in West Bengal: Challenges and extension approaches to step up production

Sritama Biswas
Technical Officer *(on contract)*, Coconut Development Board, State Centre, Kolkata

Coconut (*Cocos nucifera L.*) belongs to the palm tree family Arecaceae. Coconut cultivation is inseparably engrafted in India's socio-historical culture as well as the traditional identity.It plays an important role in contributing to India's Gross Domestic Product (GDP)as an important source of edible oil and an agro-based raw material for multifarious industries. It is a source of food, beverage, medicine, natural fibre, fuel, wood and raw material for producing a variety of goods. Considering the versatile nature of the plant and the multi-use of its products, the coconut palm is eulogized as KalpaVriksha (Tree of Heaven).

As per 2018-2019 statistics of the Coconut Development Board (CDB) under Ministry of Agriculture and Farmers Welfare, Government of India, 91% of the total coconut production falls within four southern states: Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Other states, such as West Bengal, Odisha, Maharashtra,Gujrat, Goa and those in the Northeast (Tripura and Assam) account for the remaining production. West Bengal has good agro-climatic and edaphological conditions along with its coastal line that offers good potential for coconut cultivation.

West Bengal ranks 5th place in production (384.14 million nuts) and the 2nd position in productivity (12,464 nuts/ha) in India. Major coconut producing districts of West Bengal are Murshidabad, South 24 Parganas, North 24 Parganas, East Midnapore, Howrah, Purba Barddhaman, West Midnapore, Coochbehar, Nadia, Hooghly etc.

Challenges:

In West Bengal, coconut plantation sector is confronted with a number of challenges that is resulting into abating yield. This downfall, if unchecked and poorly managed, can have unforeseen and adverse consequences on the productivity and sustainability of coconut cultivation in the state.

Majority of coconut farmers in the state have only small holdings and are considered resource-poor. Besides, coconut palms in common homestead are generally very few in number and are also found to be senile.

The coconut plants are confined to ecologically vulnerable scattered regions like eroded embankment of ponds and puddles, under shady trees, water logged areas, wastelands etc. This poses a limiting factor for its limited yield potential.

Imminent climate change is triggering deficit in rainfall, cyclones and as well as engenders to invasive pests in West Bengal. Whitefly infestation is also causing widespread damage to coconut palms. Stem bleeding, bud rot disease, insects like eriophyid mite, red palm weevil and rhinoceros beetle are also devitalizing the plantations.

Recommended package of practices in coconut cultivation in terms of spacing, method of planting, crown cleaning, nutrient, pest and water management are not properly practised by the farmers. Therefore, the production potential remains unexploited.

The SWOT analysis of coconut cultivation in West Bengal.			
Strength	Weakness	Opportunity	Threat
• Arable land	• Fragmented land	• Improved varieties	• Climate change
• Agro-climate	• Low technological adaptation	• Value addition and by product utilization	• Injudicious resource use
• Soil conditions	• Inaccessibility of quality planting materials	• Export earnings	• Labour crisis
• Water resources	• Pest problem	• Coconut based cropping systems	• Middle men
• Indigenous varieties	• Poor entrepreneurship	• Mechanization	• Price fluctuations
• Human resource	• Lack of awareness and information	• Palm insurance	• Marginal farmers
• Productivity		• Untapped potential in coastal belt	
• Market demand			
• Research and extension system			

The dearth and high labour wages in the state adversely affects the crop establishment, management and harvesting as well as the earnings obtained from coconut cultivation.

Middlemen are the 'bulk farm gate buyers' who purchase the produce at almost giveaway pennies and sell at larger prices to the consumers. As a result, coconut farmers hardly get any fair price.

Inaccessibility of quality planting materials of improved high yielding varieties suitable for different agro-climatic conditions of West Bengal is another major issue faced by the farmers.

Coconut plantations are solely dedicated for tender nut purpose in the state. Major portion of the nuts are harvested at tender stage and consumed for domestic purpose. Consequently, only a meagre portion is absorbed by the industries for further value addition.

Insufficiency of proper training and guidance on coconut based small industries or processing units is perceived by many inquisitive local entrepreneurs.

SWOT analysis

To overcome these challenges, there is a necessity of'Strength-Weakness-Opportunity-Threats (SWOT)' analysis of coconut cultivation in West Bengal so that the inherent weaknesses can be converted into opportunities and present threats can be vanquished with its strengths.

The table given above indicates the strength, the weakness, the opportunity and threats respectively. It clearly shows that more attention is needed to overcome the challenges faced by coconut sector.

Mitigation strategies

In the long run, our vision is to achieve a fully developed and globally competitive coconut industry to meet the ever growing demand under a changing climate and dwindling natural resources. To mitigate the climate change threats, there is a need to promote environment friendly technologies during the entire chain from production to consumption. The challenges should be tackled in a systematic and holistic way by conserving natural resources as well as prioritizing the need of stakeholders. The key strategies for obtaining a sustainable and vibrant plantation sector in West Bengal are:

• Enhancing the yield with a sustainable package of practices.

• To access quality, disease-free planting materials and the right agricultural inputs.

• Utilizing natural resources judiciously.

•Attaining value addition and effective market access and to reform developmental and policy issues feasibly.

CDB's extension approaches

The Coconut Development Board (CDB) provides services facilitating the coconut farmers to acquire various material and non-material inputs for their farm activities and enterprise development. There are three broad groups of offerings to coconut farming community under extension activities, which are Technical knowledge, Social skills, Input materials, subsidies etc.

CDB, State Centre, Kolkata is supporting Bengal's farmers who are engaged in coconut cultivation through several schemes like Area Expansion Programme (AEP), Production and Distribution of Planting Materials, Integrated Farming for Productivity Improvement etc. It also imparts technologies, social skills and disseminates information through several trainings, workshops, publications and demonstrations organized at different parts of the state. The extension activities conducted by the State Centre, Kolkata is furnished below.

Farmers Field Day

Farmers Field Day programmes on selected technologies used in coconut cultivation are organized to educate farmers about the different methods of planting, Integrated Nutrient Management (INM), Integrated Pest Management (IPM) and Integrated Disease Management (IDM). Such programmes not only convince the farmers about the viability of the technologies, but also help them in adopting the recommended technologies. Thus proper feedbacks and Indigenous Technical Knowledge (ITK) are also obtained from the farmers which are useful for the Board for further improvisation of the technologies.

In the financial year 2019-20, State Centre, Kolkatta has conducted several such programmes to impart technical know-how on coconut farming in various blocks of South 24 Parganas, Howrah, East Midnapore and Nadia District of West Bengal. One of those programmes was conducted at an experimental site of Bidhan Chandra Krishi Viswavidyalaya (BCKV), the State Agricultural University (SAU) of West Bengal where demonstration of the uses and effects of organic pesticides like neem oil, plant extracts on invasive white fly infestation was carried out for the farmers along with other pest control measures.

Workshops and seminars

Workshops and seminars at State-level, District-level as well as at Block-level are conducted by the Board. The main objective of such workshops and seminars is to propagate knowledge and skill on scientific coconut cultivation to the officials, extension workers and farming community.

In the year 2019-20, State Centre organized three block-level and two district-level programmes at North 24 Parganas, South 24 Parganas, Jalpaiguri and East Midnapore district. The district-level seminar in Jalpaiguri took place at the ICAR-CPCRI Research Centre, Mohitnagar. In the seminar, farmers were given awareness on various schemes, procedures and advantages of forming the Coconut Producers' Societies (CPS).

Exhibitions

The CDB showcase everything about coconut products and by-products at agricultural fairs and exhibitions for the marketing and promotion of coconut value added products. The Board provides first-hand information to the farmers and general public about the multifaceted uses of coconut. Such exhibitions bring industries, farmers, growers, exporters, technologists, processors, investors and policy agencies together to a common platform.

The CDB State Centre, Kolkata participated in

three such exhibitions during the last financial year. More than 2000 people from nearby districts visited the programme.

State Centre displayed several value added coconut products such as tender coconut water, vinegar, coconut milk powder, coconut cream, desiccated coconut, virgin coconut oil, Neera, Neera sugar, Neera jaggery, coconut biscuits, coconut chips, handicrafts made of coconut coir / shell / wood etc. Well informative posters, banners, leaflets, booklets about scientific coconut cultivation and value addition were also distributed to the interested farmers during the occasion.

Handicrafts training

Coconut shell has always been used for producing handicraft items, as a cooking fuel and to make small multi-utility bowls or serving spoons with simple bamboo joinery. However, in course of time and the improvement in tools, people started making various decorative articles by cutting coconut shell or by carving coconut wood. Extension framework for using participatory group approaches and targeted programmes for youth and women entrepreneurs are strengthened through this kind of training programmes. Cash prize for the winners and certificates to the participants are also awarded by the Board for the recognition of their hard work during the training period.

In February, 2020, State Centre organized a six day handicrafts training programme on basic coconut shell cutting at the Sasya Shyamala Krishi Vigyan Kendra, South 24 Parganas District for 15 youths from rural areas to create livelihood opportunities for them.

World Coconut Day

Every year September 2nd is celebrated as World Coconut Day to commemorate the foundation day of the Asian Pacific Coconut Community (APCC). The APCC is an intergovernmental organization mandated to promote, coordinate and harmonize coconut developmental activities in the Asian Pacific region. In India, World Coconut Day is celebrated under the aegis of CDB in various coconut growing states across the country.

In 2019, CDB conducted the World Coconut Day on the theme “Coconut for Family Wellness” at Bhubaneswar, Odisha.

Friends of Coconut Tree (FoCT)

FoCT is a programme for empowering youth groups with special emphasis on skill upgradation and improving work efficiency in coconut farming. The objective of the programme is to impart training to a group of unemployed men and women in developing technical skills, entrepreneurship capacity and communication skills to address the needs of the coconut growers as well as to tackle the problem of unavailability of coconut tree climbers for farming and plant protection activities.

During the past few years, this State Centre has conducted the FoCT programmes at several training institutes. Training is given on tree climbing, crown clearing, harvesting, pest control operations, pollination and hybridisation techniques, identification of tender, mature and seed coconuts. 3,989 unemployed youths from different districts of West Bengal have been trained till date under this skill development programme .

Dr. Jelfina C. Alouw assumes charge as ED of ICC

Dr. Jelfina C. Alouw assumes charge over as Executive Director of the International Coconut Community, Jakarta, Indonesia. Prior to this appointment she was working as head of Collaboration and Dissemination Division of the Indonesian Division for Estate Crops Research and Development, Indonesia. She is an Entomologist by profession and with her 27 years of experience in the field of agriculture development, she is frequently providing technical assistance and consultancy for coconut development to farmers, coconut industries, students, lectureres and other governmental organizations. She is the author of many informative articles on coconut which were published in renowned international journals.

FPO meetings

The main objective of the programme is to create a platform for reviewing involvement of Farmer Producers Organization (FPO) or Coconut Producers' Societies (CPS)in implementation of Board's schemes and preparation of roadmap for future activities in coconut cultivation, processing and marketing.

Exposure visits

Field visit and hands-on experience at research farms or processing units are very important for upgradation of technical knowledge of the farmers. In any field-based work, seeing is believing. Therefore, to justify it, there is a provision for the inquisitive

farmers to go on exposure visits. Such visits can get them acquainted with the innovations and progresses that have been made in coconut farming through scientific research and technologies.

Mass Media and Social Media

Mass Media as well as social media can be very effectively used to increase the awareness among

the farmers regarding coconut cultivation. Activities such as distribution of pamphlets and booklets play an important role for information dissemination. Newspapers are being used to advertise different schemes and programmes. Articles in the journals communicate the research findings and innovative ideas in coconut cultivation. All India Radio (AIR) and social media are also regularly taken up as effective tools for community mobilization in coconut cultivation.

Conclusion

Though large number of technologies has been generated for the improvement of coconut at various research institutes, it has not yet reached to the beneficiaries to the desired level. CDB is extending its outreach across West Bengal through the State Centre, Kolkata with various extension approaches. Farmers have to make use of the opportunity and put to use for making a boost in earnings from coconut cultivation. It is, therefore, anticipated that every coconut farmer of the state can harness the benefits of various assistance from CDB to increase the production of coconut in West Bengal in the near future. ■

Organic farming in coconut
A success story from Gujarat

P. P. Bhalerao[1] and H. P. Maheswarappa[2]

AICRP on Palms, Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, NAU, Navsari, Gujarat, [2]ICAR- Central Plantation Crops Research Institute, Kasaragod, Kerala

Extraction of herbal hair oil from dry copra of coconut

Coconut is one of the important plantation crops of Gujarat state particularly in the coastal areas. The coconut plant is having high economic potential for coconut growers. The state enjoys 1600 kms of coastal belt (the highest for any state in the country) most suitable for coconut plantation. As per the statistics of 2018-19, the total area under coconut in Gujarat comes to around 26,910 ha having total production of 258.56 million nuts with the productivity of 9645 nuts/ha, thereby occupying the seventh position among Indian states in area and production whereas, fourth rank in productivity of coconut. About 60 per cent of the area and production of coconut comes from the undivided coastal districts of Junagadh, Bhavnagar, Valsad, Gir Somnath and Devbhumi Dwarka. The traditional area is predominant of tall varieties of coconut which thrive for more than 80 years. Coconut is considered as the cash crop of more than 5 lakh people residing in the coastal belt. In the state, coconut farmers are facing problems like fragmented holdings, scattered production, homestead nature of cultivation, lack of skilled manpower, incidence of pest and diseases, lack of adoption of scientific cultivation practices, lack of appropriate mechanization for harvesting and small scale processing and lack of awareness about improved technologies.

Many people have the perception that chemicals are not used in growing coconuts. Hence they think that all coconuts available in the market are organic or natural coconuts. There is a wrong belief that coconuts are mostly obtained from the wild in tropical countries, which is not true in organic coconut farming. For coconut cultivation inorganic chemicals are used worldwide. Hence not all coconuts are organic coconuts or natural coconuts. Inorganic fertilizers, pesticides, herbicides and fungicides are used in growing coconuts as well. For example, according to the Coconut Development Board India, rhinoceros beetle is the most common coconut pest in India. This can be controlled using chemicals such as phorate, naphthalene balls and carbaryl. But in organic coconuts, chemicals such as inorganic fertilizers, pesticides, etc. are not used. An organic coconut farmer uses organic means in growing the coconut palms. The organic coconut farmer who cultivates organic coconut has to ensure that the palms are cultivated organically in nature.

A successful experience of farmer on organic farming in coconut with intercropping of fruits is presented below.

Mr. Nareshbhai Save, of late Mr. Bhaskar bhai Hiraji Save from Deheri village of Valsad district

was a visionary and proponent of organic agriculture way back from 1965. Mr. Nareshbhai followed the techniques of his father and continued the tradition of organic cultivation. Today he is a respected farmer and gets invitation from many organizations for delivering lectures on organic agriculture. The Kalpavruksha farm established by Mr. Bhaskar H Save is a learning centre for farmers where training are organized regularly and the farm is open to farmers on all Saturday. The whole family of Shri Nareshbhai Save includes his wife, brother, daughter and all are involved in teaching the concept of organic cultivation to farmers. The farm has coconut (West Coast Tall) in 2 ha with 305 bearing and 25 young palms. The different fruit crops like arecanut, sapota, banana, custard apple and avocado with yams are intercropped in coconut garden. Need based irrigation through channels is followed with croton plants as soil moisture indicator (dropping leaves indicate moisture stress). He adopt zero tillage and no weeding, weeds are controlled by shade management and growing cover crops. The farm is under fully organic cultivation with no external input for the last 50 years. The nutrient supply is only through recycling of biomass. The entire biomass from all the crops except economically useful parts is returned to the farm. The field is rich in earthworms and according to him, the biomass gets composed within six months. Pest and disease control is also done by biological methods taking advantage of natural food chain.

Value addition to the farm produce is an integral part of Mr. Save's philosophy of organic cultivation, where the products are also organic. He produces and markets herbal hair oil as 100 per cent chemical free. He owns a coconut nursery supplying quality seedlings to farmers and other nurseries. He is a well known farmer and trainer for many organizations like CDB, KVKs, agriculture and horticulture departments, AICRP on Palms (NAU, Navsari) and educational institutions. Efforts made by him for disseminating organic coconut based production technologies among the farmers and awareness creation on organic cultivation are well recognized. Mr. Save produce more than 10000 good quality coconut seedlings of West Coast Tall and dwarf green variety throughout the year and is selling @ Rs. 50 per seedling to farmers and nurseries. From the nursery business, he is making an income of Rs.5,00,000/- rupees. He adopted coconut based cropping system organically and achieved production of tender nuts, as well as arecanut, sapota, banana, custard apple and brinjal with net return (economy) of Rs. 2,04,887per ha. The Save family received best coconut farmer award of CDB in 2006 and has also received many awards and certificate of appreciation for doing extra ordinary work in organic farming especially in coconut cultivation. ■

Mr. Nareshbhai Save's field visit with Dr. H. P. Maheswarappa, PC, AICRP (Palms)

MINISTRY OF AYUSH

Ayurveda's Immunity Boosting Measures for self care during Covid -19 crisis

Simple Ayurvedic Procedures

Nasal application : Apply sesame oil or coconut oil or ghee in both the nostrils (Pratimarsh Nasya) in morning and evening.

Oil pulling therapy : Take one tablespoon sesame oil or coconut oil in mouth. Do not drink, swish in the mouth for 2 to 3 minutes and spit it off followed by warm water rinse. This can be done once or twice a day.

Cyclones- threat to coconut plantation in coastal Odisha

R.K.Pal
Deputy Director, Coconut Development Board, State Centre, Odisha

Cyclone, a massive and complex system of wind circulation is increasingly becoming a threat to many parts of the world, especially the coastal areas where people become homeless, devoid of food, power, electricity, incur huge agricultural loss due to damage of standing crops and harvested produce. People also face financial loss due to death of livestock which overall create a great impact on the entire ecosystem.

The east coast of India is one of the six most cyclone prone areas in the world. During the last century, the Indian sub-continent has experienced 1019 cyclonic disturbances of which 890 were along the east coast and 129 were along the western coast. 260 cyclonic disturbances had their landfall along the Odisha coast, out of which 23 were severe storms. The geographical location and physical environment make Odisha coastal zone vulnerable to frequent cyclonic disturbances. Taking together the storms and severe storms, coastal Odisha is about twice as vulnerable as compared to the other eastern states. The 480km coastline exposes the state to cyclones and storm surges.

Cyclones are becoming increasingly unpredictable worldwide. In the recent years, the US has witnessed multiple cyclones that gained rapid intensification. India has also encountered severe cyclones in recent past like Cyclone Phailin which originated in Bay of Bengal, hit Gopalpur of Ganjam district of Odisha on 12th October 2013.

Cyclone Hudhud, made a landfall near Visakhapatnam with a wind speed of 170-180km/hr on 12th October 2014.

Cyclone Ockhi was a strong tropical cyclone that originated in Arabian sea and devastated parts of Sri Lanka and India between 29th November to 6th December 2017. It stroke Lakshwadeep on November 30.

Cyclone Titli , a severe cyclonic storm, originated in Bay of Bengal, hit the coast of Odisha on 10th October 2018.

Table 1: District wise area affected by Fani									
No.	District Uproot-ed	Broken		Partial crown damaged		Full crown damage		Total Damage	
		In nos.	In ha.@175 nos./ha.	In nos.	In ha.@175 nos./ha.	In nos.	In ha.@175 nos./ha.	In nos.	In ha.@175 nos./ha.
1.	Cuttack	525	3	3500	20	1050	6	5075	29
2.	J.B. Pur	787	4.5	438	2.5	350	2	1575	9
3.	Jajpur	1925	11	8487	48.5	4498	25.7	14910	85.2
4.	Kendra-pada	1750	10	5250	30	3500	20	10500	60
5.	Puri	328650	1878	357525	2043	473200	2704	1159375	6625
6.	Khordha	24290	138.3	42350	242	129675	741	196315	1121.8
	Total	**357927**	**2045.3**	**417550**	**2386**	**612273**	**3498.7**	**1387750**	**7930**

Cyclone Gaja, originated from a low-pressure area over the Gulf of Thailand and intensified into a cyclonic storm on 11th November 2018,made a landfall in Tamil Nadu and Puducherry area at a highest speed of 150kmph.

The cyclone FANI made landfall on 3rd May 2019 between Satapada and Puri as an extremely severe cyclonic storm. As reported by IMD, the maximum sustained surface wind speed of 170-180 kmph gusting to 205 kmph was observed during the landfall. After the landfall, it continued for 6 hours and then afterwards it decreased. The Doppler Rader image at Paradeep shows that the cyclone completely made landfall on 3rd May 2019.

Reasons of Cyclone

Ocean temperature is rising due to global warming. This has fundamentally altered the character of cyclones. Cyclones are fed by moisture which is sucked up due to the increasing temperature over the sea surface. Since 1970, sea surface temperatures worldwide have gone up by an average of 0.1°Celsius per decade as oceans act like heat sinks. Warm air holds more water vapour and this provides additional fuel for cyclones. Apart from warming oceans, cyclones are also influenced by air pressure and local wind patterns. A cyclone forms around a low-pressure area that pulls air from the ground, expands and cools down. When this process keeps repeating, the cyclone collects moisture and grows.

Super-cyclone "Fani" and its devastating effect

Fani storm made a landfall at Puri on 3rd May 2019 after meandering over the sea and land for 11 days, making it the longest-lived cyclone in the Bay of Bengal ever observed.

As per report released from Disaster Management Department, Govt of Odisha, about 1.43lakhs hectare of agriculture crops and 2638 hectares of horticulture crops sustained crop loss of more than 33% due to the cyclonic storms and subsequent heavy rain. 34.31 lakh livestock and 53.52 lakh poultry have been affected. 6753 fishermen boats and 7680 fishing nets were damaged either lost or fully/partially damaged. Apart from this, there were huge loss in handloom and handicraft sector, rural water supply,irrigation,primary health centres, power supply, etc. Loss of public properties were estimated at around twelve thousand lakh of rupees.

It was reported that " Cyclone Fani, the second-most powerful cyclone to have hit Odisha, has uprooted about 14 lakh coconut trees, affecting around 50,000 coconut farmers in the state. The storm, which made landfall in Puri on May 3, 2019 with a wind speed of 175 kilometres per hour, rampaged nearly 8,000 hectares of coconut farms. Besides coconut farms, the cyclone also damaged weavers' looms, betel vineyards, craftsmen's tools, trees and fishermen's boats and have left agricultural fields inundated." *(www.downtoearth.org.in/NATURAL- DISASTERS)*

As reported by State Govt., due to 'Fani', an area of 7930 ha was affected out of which 5544ha was permanently damaged due to uprooting/ broken/ crown damage. Partial crown damage has occurred in an area of 2386 ha.

The district wise coconut area affected is given in Table 1 *(Source: Directorate of Horticulture, Govt. of Odisha)*.

Damage caused by extremely severe super cyclone "Fani"
Farmers field at Brahmagiri, District-Puri

Present scenario of coconut plantation

As per the statistics of Horticulture Division, Dept of Agriculture & Cooperation, Ministry of Agriculture & Farmers Welfare, Government of India, of 2018-19, total area under coconut plantation in Odisha was 50,910 hectares with production of 342 million nuts (6719nuts/ha). Puri district itself used to contribute 25% of total production, area wise covering 20% of total coconut plantation (8840nuts/ha). Most of the coconut orchards/gardens including seed gardens were located in different areas of Puri district like Brahmagiri, Konark, Nimapara, Chandanpur etc which were mostly ravaged due to 'Fani'. Regulated market of coconut located at Sakhigopal is in distress situation having no local supply, which only depends on supply of coconut from neighbouring state like Andhra Pradesh and Tamil Nadu.

Thus the production from around 45000 hactares (after deducting 5544 hectare fully damaged area from total area) will give less production of around 40%, as the partially damaged plants will require another 2 to 3 years for recovering the loss due to crown damage, as per expert opinion. Naturally there has become a great impact on income generation through coconut cultivation.

Such immense loss of coconut could be prevented if the coconut growers adopted scientific method of planting based on soil texture, proper pit digging, proper spacing, nutrition management, integrated pest management etc. High density of planting with close spacing, shallow depth of pit and unhealthy growth with narrow trunks were accountable for more damage apart from the wind speed.

Technical advice

Technical advice as given by the ICAR and OUAT scientists and Coconut Development Board are as follows:

- To cut and remove the uprooted and broken palms from the field so that pest and disease will not prevail. If felled trunks and boles remain in the field, it will act as breeding ground for coconut pests. So field sanitation is essential.
- To cut the twisted spear leaves upto 6 inches below twist and remove the leaves which are obstructing the spindle leaf, and drench/pour immediately with copper based fungicide and cover with polythene to prevent bud rot infections.
- Adequate Irrigation to the palms
- Application of double dose of fertiliser
- Tilted or bent young coconut palms are to be erected immediately by providing support.

Damage at DSP Farm, Pitapally, Odisha

DSP Farm, Pitapalli after 10 months

Action taken at DSP Farm and result thereof

DSP Farm, CDB,Pitapalli, District- Khurda which is only 60km away from Puri sea coast, was also devastated due to 'Fani'. Landfall process started in the morning between Satapada and Puri, and continued for 3 hours at wind speed of 170-180kmph gusting to 205kmph. This farm experienced highest speed of wind @ 150-160kmph at different intervals between 10.30am and 1.00 am, though stormy wind started at 7-30AM and continued upto 2-30PM. This resulted in 490 palms (13% of total palms) being completely uprooted or broken at mid-trunk, around 75% palms suffered crown damage, apart from that branches with full of mango fruits, sapota, cashew, guava etc were broken, also uprooted in many cases, green house, shed-net house, go-downs etc were damaged severely along with other loss of properties like transformer, electric poles, wiring, lights, vermicompost tank sheds, glass window panes of office building etc. Typically, it was observed that the crowns were twisted to one direction which were common in most of the plots as per the direction of cyclonic winds. Altogether, it was a complete mess for the entire farm.

Action was taken to revive the situation of plantation after electricity and water supply became available on the 18th day after 'Fani' like life saving irrigation to all palms and intercrops, removal of broken and dead branches, erecting the young bent palms, drenching of central portion of crown with fungicide to prevent bud rot, and other advices as recommended by the technical committee. Afterwards, crown cleaning, fertiliser application followed with adequate irrigation etc were done as routine operational practices.

As a result, condition of the palms has improved and expected to revive by 70% within another year. But harvesting of nuts shows around 20-25% rejected/barren nuts, which as per scientists of OUAT, is the result of abortion and damage of growing immature nuts caused due to high wind speed.

Unpredictable wind pattern may cause more damages in future to the coconut plantation in the coastal Odisha, but more care should be taken during planting of new seedlings after 'Fani' and management of existing palms to prevent easy fall or broken down of palms during high wind speed. Scientists may also explore the suitability of varieties and package to be developed for coastal eastern and western India, which are vulnerable areas for cyclonic winds. ■

Defoliation of coconut palms due to slug caterpillar feeding

Successful management of slug caterpillar outbreak in Andhra Pradesh through IPM

Chalapathi Rao, N.B.V ., Chakkani Priya, K., Ramanandam, G, Bhagavan, B.V.K and Maheswarappa, H.P
.AICRP on Palms, HRS, Ambajipeta (DRYSRHU), East Godavari Dt., Andhra Pradesh

One of the major factors that contribute to the loss of production and productivity in important plantation crops viz., coconut and oil palm is damaged due to the insect pests particularly leaf eating caterpillars. Slug caterpillar *Macroplectra nararia* earlier considered as sporadic pest is at present becoming regular and endemic on coconut and oil palm in Godavari districts of Andhra Pradesh causing serious losses to these plantation crops. The caterpillar is greenish brown in colour, covered with tiny spines that cause severe irritation on contact to the skin. The young larvae feed on the epidermis on lower side of the leaflet, scrapping the surface tissue giving a glistening appearance in the feeding area and later leaf spot-like black halo markings develop on the feeding areas which later coalesce and form bigger lesions. The later instar caterpillars feed voraciously on entire laminar portion of the leaflets leaving only mid ribs. In severe outbreaks, the caterpillar even feeds even on the leaf stalks and nuts surface of coconut resulting in gum ooze symptoms. The affected leaf fronds show a burnt

Slug caterpillar earlier considered as a sporadic pest is at present becoming regular and endemic on coconut and oil palm in Godavari districts of Andhra Pradesh causing serious loss to the plantation crops. The caterpillar is greenish brown in colour, covered with tiny spines that cause severe irritation on contact to the skin.


Monitoring slug caterpillar incidence with help of light traps


Adult moths attracted to light traps

appearance and in case of severe attack the whole palm looses all green chlorophyll area and bores a dried appearance. The larval period lasts for 30 ± 2 days. The larvae pupate inside a round brown shell like cocoon in the crown region or in leaflet axils and lasts for 15 days. The adults are brown coloured, sluggish and rest in inverted position mostly in the crown region during day time and have a longevity of five days. Females are larger in size than males and lay about 100-150 eggs in groups on leaves which again hatch in four to five days.

Starting from the year 2012 regular out breaks of this caterpillar were reported in East and West Godavari districts of Andhra Pradesh. With weaning of usage of red labelled harmful insecticide monocrotophos which was widely recommended for root feeding in coconut ecosystem, impetus on development of eco-friendly pest management strategies were formulated. An outbreak of slug caterpillar *Macroplectra nararia* was recorded in an area of 135 ha during March 2019 in Poduru village (Poduru mandal) and in an area of 100 ha in Zinnur village (Palakoderu mandal) during February 2020 on coconut in West Godavari district of Andhra Pradesh. The pest incidence was observed in sole coconut gardens, coconut palms on fish pond and paddy field bunds. Scientists of Horticultural Research Station, Ambajipeta, under AICRP on Palms, Dr. Y.S.R. Horticultural University conducted timely awareness programmes on integrated management of slug caterpillar during both the years and demonstrated the developed IPM package thereby preventing further spread of the outbreak.

The IPM package comprised of mechanical removal and destroying larval and pupal stages present in two to three heavily infested dried leaves in outer whorls of the coconut palm.


Release of Pediobius imbreus in slug caterpillar infested gardens

Pediobius imbreus a potential parasitoid on slug caterpillar was identified in 2018 and timely release of this parasitoid gave impetus to biological control based IPM. The mass production procedure and release rates of this parasitoid were standardized under AICRP palms. When the pest is in early larval stage (first to third instar), the release rate was fixed as @ 60 per palm at fortnight intervals on ten per cent of total palms in the garden (@ 600 number per acre). The per cent parasitisation of slug caterpillar was very high ranging from 30.33 ± 2.28 to 50.23 ± 1.87 per cent parasitisation within 30 days after release in experimental gardens and natural perpetuation of parsitoid and parasitoid recovery was also observed in unreleased adjoining

gardens. On a pilot scale about 11200 parasitoids were released covering 18.5 acres in 2019 and 10000 parasitoids were released covering 16.5 acres in 2020 and larval population and subsequent stages of pest build up dwindled exceptionaly in the released gardens and natural build up of parasitoid was also recorded.

Continuous monitoring for life stages of slug caterpillar was carried out and when more than 75% of pest population is in pupal and adult stage, 200 Watts incandescent light traps were installed @ 5 per hectare, at 1 ½ feet above the ground level and water pan is kept below the light trap from 9 pm to midnight for three hours to attract and kill the moths as these moths which are highly phototropic.

In young gardens, where the pest incidence is high with larval stage and feasibility for spraying two sprays of eco friendly green label insecticide Chlorantraniliprole 18.5 % SC @ 0.3 ml/litre was done at 15 days interval

For quick recovery of pest affected palms application of recommended dose of fertilizers can also be done.

This integrated approach led to checking in build up of pest population and the out break area affected was limited to only 56 ha and 41 ha in 2019 and 2020 respectively as compared to 227 ha and 145 ha in 2017 and 2018 , respectively Further, keeping in view of regular incidence of slug caterpillar the hot spot areas of the pest were mapped and various programs in association with farmer groups and department of Horticulture were carried out to create awareness on incidence and pest management. As p*arasitoid P. imbreus* was highly effective the parasitoid culture is regularly being maintained in bio control lab, HRS., Ambajipeta for supply to farmers for timely field releases. In addition regular monitoring activity in hot spot areas is also being carried out along with roving survey in the affected plantations to have a constant vigil and prevent the future out breaks of this dreaded pest. ■

Neera Sapper of Nava Design awarded Millenium Alliance Grant

The Neera Sapper developed by Cochin based startup. Nava Design is awarded the prestigious Millenium Alliance Grant.

The Technology Development Board (TDB) in partnership with United States Agency for International Development (USAID) and Federation of Indian Chambers of Commerce & Industry (FICCI) has launched the Millennium Alliance program under which innovators will be provided with services such as seed funding, grants, incubation, networking opportunities, business support, knowledge exchange and technical assistance which will facilitate further access to equity, debt, and other capital to the innovators.

The Millennium Alliance (MA) is an inclusive platform to leverage Indian creativity, expertise, and resources to identify and scale innovative solutions being developed and tested in India to address development challenges that will benefit the base of the pyramid populations across India and the world. The MA is a network to bring together various actors within India's social innovation ecosystem including social innovators, philanthropy organizations, social venture capitalists, angel investors, donors, service providers, and corporate foundations to stimulate and facilitate financial and other support to the innovators.

Through the Millennium Alliance, TDB, USAID, FICCI, and other partners who have also joined seek to realize India's role as a global innovation laboratory.

Link: http://tdb.gov.in/millennium-alliance/

Get closer to nature

and reduce your carbon footprint for a greener and healthier tomorrow

iD Fresh Food adds tender coconut and fresh grated coconut to its product portfolio

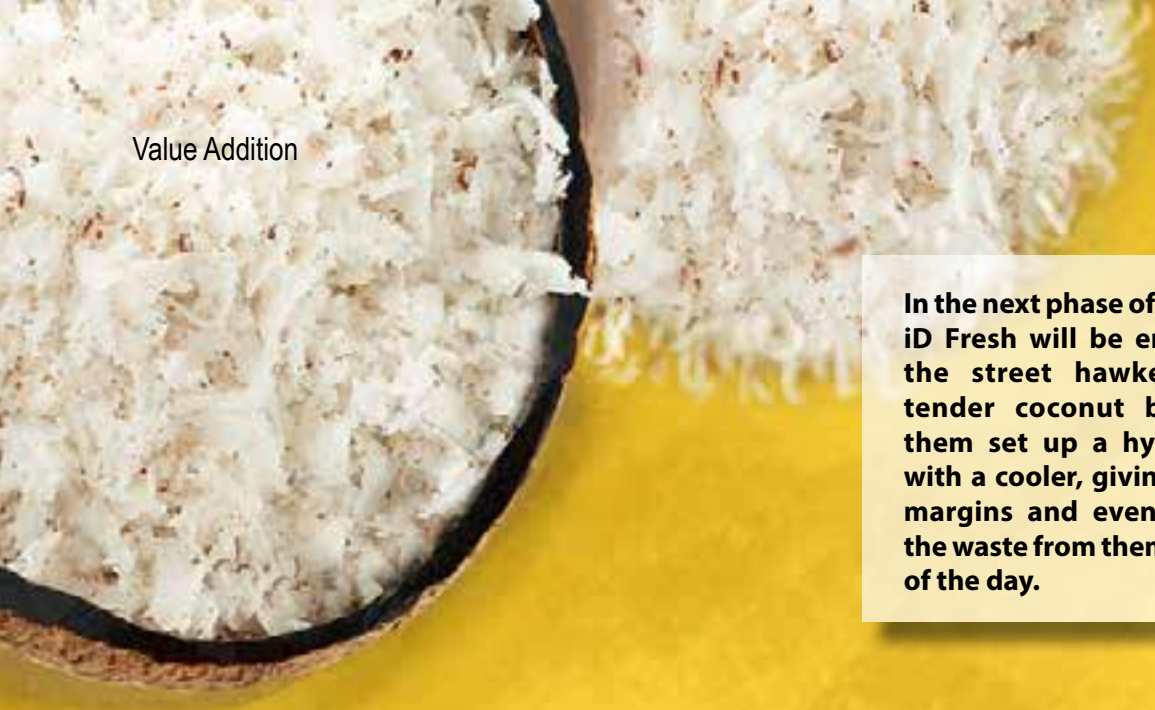
With the New Year Resolution - get closer to nature, reduce your carbon footprint- iD Fresh Food , a Bangalore based food product company has started in 2020 with the launch of iD Smart Sip Tender Coconut and iD Grated Coconut in a Coconut, marking India's largest fresh food brand's maiden effort in finding sustainable packaging solutions for a greener and healthier tomorrow. And what better products than tender coconut and grated coconut – that too in their natural packaging – is better to drive home the new year resolution.

The company has sought to reduce the weight of the coconut to 400-500 gram by removing the husk. Priced at Rs.60 a piece, the tender coconut can be opened by just a hard-press on the slit provided on top. Mounted atop cardboard, it comes with information on water content, pulp, sweetness level and edible quantity.Similarly, grated coconut is packed in the coconut shell itself with a soft opening on top, and can be emptied easily in to a vessel.

With Know Your Coconut as its core message, iD Fresh's Smart Sip Tender Coconut empower customers with valuable information without opening the coconut, offering them a choice to purchase on the basis of their need. The Tender coconuts are priced based on the edible content and sweetness level.

iD Fresh offers consumers not just convenience, but also a healthier alternative to chemically preserved frozen or desiccated coconut that is currently available in the market. Musthafa PC, CEO and co-founder of iD Fresh Food

Fresh, moist & juicy grated coconut is packed in the coconut itself. The coconut shell keeps the grated coconut tender & fresh. iD Tender Coconut package indicates the volume of coconut water & soft pulp contained inside along with the sweetness level of the water.



In the next phase of the launch, iD Fresh will be empowering the street hawkers selling tender coconut by helping them set up a hygienic cart with a cooler, giving fair price margins and even collecting the waste from them at the end of the day.

affirms that their vision for 2020 is to go green. As a consumer-centric company committed to preserving the tradition of Indian cooking with healthy and fresh ingredients, the company is constantly looking for ways to reduce the use of plastic in product packaging. With the Smart Sip Tender Coconut and Grated Coconut in a Coconut, they have taken baby steps towards a gradual reduction of plastic waste. Last year, when iD Fresh Organic was launched, the consumers were assured their best to find more environment-friendly and sustainable solutions. By 2022, iD Fresh aims to capture 60-70 percent of the organised packaged coconut market share.

Initially the company plans to make available, iD Smart Sip Tender Coconut and iD Grated Coconut in a Coconut at retail outlets as well as at iD Kiosks where consumers can experience the taste, freshness and quality of the products before making the purchase. In the next phase of the launch, iD fresh will be empowering the street hawkers selling tender coconut by helping them set up a hygienic cart with a cooler, giving fair price margins and even collecting the waste from them at the end of the day.

With increased awareness on health and rising consumer preferences towards natural and healthy food and beverages, Musthafa, is well aware of the huge opportunities of the coconut industry in India. Initially the products will be introduced in Bengaluru, followed by other key markets including Kerala, Tamil Nadu and Andhra Pradesh, among others. A revenue of INR 100 crore from both the coconut products is expected by the iD fresh in the ensuing three years.

Since iD Fresh's inception in 2005, the company has consistently offered customers easy-to-cook, preservative-free and traditional Indian foods. Similarly the grated coconut offers customers a healthier and eco-friendly alternative to frozen grated coconut and frozen desiccated grated coconut. The tender coconut promises not just health benefits, but also greater transparency in terms of product volume, sweetness and the like. iD Fresh believes that these unique products will have a strong consumer resonance as they are brought out with a valuable offering vis-à-vis quality, convenience and natural packaging.

Started in 2005, as a small establishment in Bangalore, iD Fresh Food has come a long way and set several milestones along the way. The company has presence in 45 + cities across India, US and UAE, with a team of more than 1500+ employees. The company provides 55,000 kgs of Idly/Dosa batter per day, with other products like Parotas, Vada batter, Chapati and paneer among others to more than 30,000 retail outlets.

The company has been awarded certifications from the Agricultural and Processed Food Products Export Development Authority (APEDA), National Programme for Organic Production (NPOP), United States Department of Agriculture (USDA) and Jaivik Bharat, under the Food Safety and Standards Authority of India (FSSAI).

iD Fresh Grated coconut

Press your thumbs on the side of the cork and push upwards for freshly grated coconut.

Replace cork tightly after use & store in the refrigerator.

The Company

ID Fresh foods is a private limited food product company based in Bangalore, India founded in 2005 by P.C Mustafa and his four cousins - Abdul Nazer, Shamsudeen TK, Jafar TK, and Noushad TA. The company is manufacturing a range of fresh foods including Idly/Dosa Batter, Parotas, chapatis, curd, paneer. Tender Coconut and Grated Coconut

The company was established with the capital of Rs 50000 by Mustafa and initially supplied ten packets of one-kilogram batter to 20 stores in Bengaluru under the brand name 'ID'(Idly, Dosa) – operating from a 550 square feet space with two grinders, a mixer, and a sealing machine. As the demand for their product increased, the company started making 2000 Kg of batter daily. And also, the number of stores partnered with them was increased to 300

In 2014, ID Fresh foods raised Rs 35 crore in the first round of funding from Helion Venture Partners. In 2016, ID Fresh foods manufacturing around 50,000 kg of batter daily from their units across the country and one in Dubai, which is converted into a million idlis. ID Fresh Foods has established itself an one of the major leaders of ready to cook package foods in 2018 with a primarily South Indian taste. By 2018, 46% of the ID Fresh food's business came from the idli/ dosa batter. Malabar Parotas: by 2018, 32% of the ID Fresh food's business was from the parota's, by 2018, 14% of the business came from the chapati's. It was in 2019, iD Fresh ventured into the non-alcoholic beverage space with ready-to-use South Indian filter coffee decoction. The Bengaluru-based brand provides 65000 kgs of idly/dosa batter per day, alongside ready-to-eat products like parotas, vada batter, chapati and paneer to over 30000 retail outlets. The debt-free company is funded by Azim Premji-led Premji Invest and Helion Venture Partners. ■

iD Fresh Tender coconut

For water, peel the sticker and pierce with straw.

For pulp, use thumb or spoon on the groove.

Consume immediately and grow a plant in the empty shell.

Strategies for management of Rugose Whitefly in coconut

Coconut Development Board organised a workshop on Strategies for management of Rugose Spiralling Whitefly (RSW) in coconut at KVK Conference hall, Dr. YSR Horticultural University, West Godavari, Andhra Pradesh on 28th February 2020.

The session was inaugurated by Sri. Chiranjiv Choudhary, IFS, Hon'ble Vice Chancellor, Dr.YSRHU & Commissioner of Horticulture to Govt. of Andhra Pradesh. Dr R.V.S.K. Reddy, Director of Research, Dr. YSRHU, Shri Saradindu Das, Chief Coconut Development Officer, Dr Bhagwan, Zonal head, HRS, Venkataramannagudem, CDB officials, Deputy Directors and ADHs/HOs from State Horticulture Department, and farmer representatives from affected districts and representatives of CPCs attended the programme.

Shri. Chiranjiv Choudhary, IFS, Vice-Chancellor, Dr.YSRHU & Commissioner of Horticulture to Govt. of Andhra in his special address spoke on the need for the control of spiralling white fly which is only possible through community based approaches and hence strategies for same to be formulated. Since the pest is prevalent for two years, management of this invasive pest is not achieved so far. He also requested CDB to support the farmers with schemes for controlling the existing situation.

Shri. Saradindu Das, Chief Coconut Development Officer, CDB, Kochi, pointed out that the main purpose of this workshop was to assess the extent of damage and percentage of loss caused due to white fly in Coconut. He requested the Department to take up a roving survey in all affected districts so that CDB can take up the matter to Govt. of India for support and to formulate suitable management

programmes in farmers fields.

Smt. T. Bala Sudhahari, Director, CDB, Chennai in her welcome address pointed out the objectives of CDB in organising this workshop.

Sri T. Subba rao, DDH, Eluru, West Godavari, stressed on action taken by Department for controlling the RSW in the district. The department is conducting trainings at each mandal levels, supply of Isaria fumosorosea fungus to the farmers with the help of IIOPR, Pedavegi and also supplying *Dichochysa sps* eggs to the farmers for effective management of RSW in each village.

Dr. R.V.S.K.Reddy, Director of Research, Dr. YSRHU explained about the research and development activities of *Dichochysa* sps and Isaria *fumosorosea* against RSW and advised the farmers not to go for insecticidal application in Whitefly affected gardens as they totally affect the bio control agents. He also suggested that mass multiplication of Isaria *fumosorosea* fungus need to be taken up at farmer's level. Shri. S. Ram Mohan Rao, DDH, East Godavari pointed out that to control spread of RSW steps have

PANACEA-2020

With an objective of creating awareness among people on various natural coconut products and byproducts for day to day use and to introduce distributers and entrepreneurs of coconut products and to highlight Board's activities, Coconut Development Board participated in PANACEA 2020 from 5th to 7th March-2020 at World Trade Centre Mumbai. The fair was organized by Scishido Communication, Mumbai. M/s. Keratech (P) Ltd. Thrissur, Kerala, manufacturer of Virgin Coconut Oil, Desiccated Coconut Powder, Virgin plus tablets and Coconut Cream, M/s. Kokoco Innovative Beverages Private Limited, Pune, manufacturer of minimally processed coconut and Tender coconut ice cream, and M/s.Madura Agro Process Pvt.Ltd. Coimbatore, Tamil Nadu, manufacturer of Coconut Water, Coconut Sugar, Coconut Chips etc. displayed their products in the Board's Stall. Coconut Development Board displayed various value added coconut products, informative charts, posters and Board's publications.

More than 5000 visitors including distributors, exporters, entrepreneurs, farmers, VIPs, officials of various government Departments, NGOs, business communities including foreigners from various countries attended the expo.

CDB Participated in Rural India Business conclave

CDB Participated in Rural India Business conclave at CPCRI, Karasagod from 27th February to 3rd March 2020. Shri. V. Muralidharan, Minister of State for External Affairs, Govt. India visited CDB stall.

to be taken up from nursery level itself. He added that large scale multiplication of fungus at state and national level need to be taken up. Further he also pointed out the need to establish one bio control lab at each district level for farmers well being. Dr. B.V.K. Bhagawan, Zonal Research Head, Dr. YSRHU, stressed on control of spiralling white fly only possible through community basis and also spoke about research and development activities of HRS, Ambajipetta.

In the technical session which followed, Dr. P. Kalidas, Principal Scientist (Ento.), IIOPR, Pedavegi, on mass multiplication of Isaria *fumosorosea* fungus at home level and also clarified farmers queries regarding the usage of this fungus.

Dr. N.B.V.Chalapathi Rao, Principal Scientist also explained the management startegies to be adopted for RSW management and also developmental activities of HRS, Ambhajipet towards development of bio control agents for management of Rugose Spiralling Whitefly. Dr. P. Rama Devi, Senior Scientist and Head, HRS, Venkataramannagudem also handled a session on mass multiplication of fungus at HRS laboratory. She explained how the management practices have to be taken up by farmers. In the discussion forum, farmers raised their apprehensions and queries regarding RSW management and concerned officials explained the same. Smt. Resmi DS, Deputy Director (i/c), CDB, Vijayawada proposed vote of thanks.

Cultivation practices for coconut-July

Planting

In localities where the onset of south-west monsoon was delayed or received inadequate rainfall, planting of seedlings may be taken up in July. If continuous heavy rain occurs after planting, care should be taken to avoid water stagnation in the pit by providing drainage.

Bund should be made around the planting pit using bottom soil to avoid run-off water entering the pit.

Nursery management

Weeding should be done wherever necessary. Water stagnation should be avoided in the nursery bed by providing adequate drainage.

Plant protection

The active monsoon phase of July month is the period of pest recession and disease escalation. Wetness usually reduces the pest incidence but aggravates the spread of disease propagules. It is therefore a period of critical monitoring to prevent the entry of deadly pathogen such as bud rot disease into the palm system. Any injury due to pest incidence would also favour higher occurrence of disease on palms. Incidences of rugose spiralling whitefly, nesting whitefly and black headed caterpillar would be in the diminishing phase and the attack by red palm weevil would be emerging fast in different localities. Bud rot and leaf rot diseases are common diseases during the period.

Red palm weevil *(Rhynchophorus ferrugineus)*

Reduction in the incidences of rhinoceros beetle, would subsequently suppress the invasive potential of the killer pest, viz., the red palm weevil, which needs an injury for the weevils to orient towards the palm cue and lay eggs. Dwarf genotypes and palms aged between 5-15 years are relatively more susceptible. All life stages of the pest were noticed inside the

Adult weevils

infested palms. Being a fatal enemy of palms, 1% action threshold has been fixed. Correct geometry is very crucial for accommodating intercrops as well as pest avoidance due to multiple odour cues.

▶ *Management*

- Field sanitation is very critical and all residual population in crown toppled palms should be destroyed
- Avoiding palm injury is very critical to disorient the gravid weevils away from the field and therefore leave out at least one metre from palm trunk when petioles are cut.
- Crop geometry and correct spacing is very crucial to reduce pest attack.

- Timely and targeted spot application of imidacloprid 0.002% (1 ml per litre of water) or indoxocarb 0.04% (2.5 ml per litre of water) on infested palms would kill the feeding grubs and induces recovery of palms by putting forth new spear leaf.

Crown entry

- Crop-habitat diversification (Ecological Bio-engineering) through coconut based cropping system strategy inciting defenders and pollinators would diffuse the palm-linked volatile cues and encouraged pest suppression. Diversified cropping system reduces pest incidence than mono-cropping.

Toppling of palm

Black headed caterpillar, *Opisina arenosella*

The coconut black headed caterpillar, Opisina arenosella, is a major pest distributed in almost all coconut growing tracts across the country especially along the water bodies during winter, however, a recent outbreak during May-June in certain tracts of Kasaragod district is reported. The infested portions get dried and form conspicuous grey patches on the upper surface of the lower fronds. Severe pest damage results in complete drying of middle to inner whorl of fronds leaving a burnt appearance. Presence of black headed caterpillars, webbing of leaflets and occurrence of dried faecal matter on the leaflets are the characteristic features of pest incidence. In the absence of natural enemies in the new area of emergence, the outbreak becomes faster and expands at high speed. Damage results in tremendous reduction in photosynthetic area, decline in rate of production of spikes, increased

Pest-infested field

Black headed caterpillar Goniozus nephantidis

premature nut fall and retarded growth. Extensive feeding of caterpillars causes a crop loss of 45.4% in terms of nut yield in addition to rendering the fronds unsuitable for thatching and other purposes. Farmers need not panic and this approach is one of the classical examples of successful augmentative biological control suppressed by natural enemies.

▶ *Management*

a) Regular monitoring of palm fronds for pest occurrence in endemic zones.

b) Removal and destruction of 2-3 older and dried leaves harbouring various stages of the pest. The leaflets could be burnt to reduce the caterpillar/ pupal population.

c) Domestic quarantine should be strengthened by not transporting coconut fronds from pest-infested zone to pest free zone.

d) Augmentative release of the larval parasitoids viz., Goniozus nephantidis (20 parasitoids per palm) and Bracon brevicornis(30 parasitoids per palm) if the pest stages is at third-instar larvae and above. The pre-pupal parasitoid (Elasmus nephantidis) and pupal parasitoid (Brachymeria nosatoi) are equally effective in pest suppression and are released at the rates of 49% and 32%, respectively for every 100 pre-pupae and pupae estimated.

P.bondari

P. minei

Cybocephalus sp.

e) Before releasing, the parasitoids are adequately fed with honey and exposed to host odours (gallery volatiles) for enhancing host searching ability.

f) Ensure adequate irrigation and recommended application of nutrients for improvement of palm health.

Nesting whiteflies (*Paraleyrodes bondari and Paraleyrodes minei)*

In addition to the rugose spiralling whitefly, two more nesting whiteflies (Paraleyrodes bondari and Paraleyrodes minei) are found associated with palm leaflets. Nesting whiteflies are smaller in size (1.1 mm) than rugose spiralling whitefly (2.5 mm). The nymphs are flatter with fibreglass like strands emerging form dorsum whereas the nymphs of rugose spiralling whitefly are convex in shape. Adult nesting whiteflies construct bird's nest like brooding chamber and sustains in the chamber. P. bondari had X-shaped oblique black marking on wings with two minute projections on rod shaped male genitalia whereas P.minei is devoid of black markings on wings and possesses cock-head like genitalia.

▶ *Management*

- In juvenile palms, spraying of water with jet speed could dislodge the whitefly and reduce the feeding as well as breeding potential of the pest.
- Ensure good nutrition and adequate watering to improve the health of juvenile and adult palms
- Effective nitidulid predators belonging to Cybocephalus sp. were observed on the palm system and pesticide holiday is advised for conservation biological control.

Diseases

Leaf rot disease *(Colletotrichum gloeosporioides, Exserohilum rostratum)*

It is commonly observed on palms affected by root (wilt) disease wherein foliar necrosis of terminal spear leaf and adjacent leaves are registered. The disease prominently noticed in the monsoon phase during the month of July-December. Affected leaves turn necrotic and are not detachable from the palm and remain intact. This disease could be initially observed as minute lesions which later enlarge, coalesce and cause extensive rotting affecting the photosynthetic efficiency of palms. The disease is endemic to root (wilt) affected regions of Southern Kerala.

▶ *Management*

- Need based pruning and destruction of affected spear leaf and other adjacent leaves in the terminal region
- Spot application of hexaconazole 2 ml in 300 ml water on the affected spear leaf region
- Soil test based nutrition for improving the health of the palm and ensure adequate irrigation

Bud rot or immature nut fall *(Phytophthora palmivora)*

In certain humid locations bud rot occurred regularly killing hundreds of trees. In India, bud rot incidence is recorded as less than one per cent. Pathogen attacks the bud region leading to rotting of bud and death of palms. The first visible symptom is withering of the spindle marked by pale colour. The spear leaf or spindle turns brown and bends down. The affected spear leaf can easily be pulled out as the basal portion of the spindle is completely rotten emitting a foul smell. Temperature range of 20- 24ºC and relative humidity of 98% - 100% were found optimum for

Leaf rot disease affected palm leaflets

the development of the bud rot disease. Contiguous occurrence of such "favourable days" during rainy seasons determines the development of the disease and the intensity of infection. As Phytophthora diseases are known to be extremely fatal, a close scrutiny is mandatory during monsoon period to assess the health of the palm especially the spear leaf zone.

▶ *Management*

- Regular cleaning of the crown and prophylactic spraying of Bordeaux mixture (1%) to the crown just before the onset of monsoon and one more spray after 35-40 days help in reducing the bud rot incidence.
- Field sanitation and provide proper drainage during rainy season.
- Placement of two Trichoderma (Trichoderma harzianum CPTD28 isolate) enriched coir pith cakes in the inner most leaf axils just before the onset of monsoon and again after every two monthsas prophylactic measure.
- In disease affected palms, remove the entire rotten portion of the spindle by cutting with a sharp knife and apply 10% Bordeaux paste to the wound and cover with polythene sheet to prevent entry of rain water. The protective covering has to be retained till normal shoot emerges.

Correct and timely diagnosis of insect pests as well as disease causing pathogens would be the key factors for the implementation of effective management solutions. Delayed detection would take a longer time for recovery from pest invasion. Prophylactic

Withering of spear leaf

treatment evading diseases are very important during monsoon phase. Hence a close scrutiny of palms through effective scouting and timely diagnosis would form the basis in doubling income through increased production. ■

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Market Review – May 2020

Domestic Price

Coconut Oil

During the month of May 2020 the price of coconut oil opened at Rs. 15600 per quintal at Kochi and Rs. 15600 per quintal at Alappuzha market. During the month, price of coconut oil at Kochi and Alappuzha, markets expressed a mixed trend.

The price of coconut oil closed at Rs. 15500 per quintal at Kochi with a net loss of Rs.100 per quintal at Kochi market. The price of coconut oil at Alappuzha market opened and closed at the same price.

Owing to covid-19 national level lockdown, the price of coconut oil was not reported from Kozhikode market during the period from 1st June 2020 to 20th June 2020. The price of coconut oil at Kozhikode market opened at Rs. 17600 per quintal on 23rd June 2020 and closed at Rs. 16000, per quintal.

The prices of coconut oil at Kangayam market is not reported during the month.

Weekly price of coconut oil at major markets Rs/Quintal)				
	Kochi	Alappuzha	Kozhikode	Kangayam
02.05.2020	15600	15600	NR	NR
09.05.2020	16500	16500	NR	NR
16.05.2020	16300	16300	NR	NR
23.05.2020	16100	16200	17600	NR
30.05.2020	15500	15600	16000	NR

Milling copra

During the month, the price of milling copra opened at Rs.11100 per quintal at Kochi and Rs.11000 per quintal at Alappuzha market. The price of Copra at Kochi market and Alappuzha market expressed a downward trend.

The prices closed at Rs.9600 per quintal at Kochi market and Rs.9650 per quintal at Alappuzha market with a net loss of Rs.1500 and Rs.1350 per quintal respectively.

The price of milling copra at Kozhikode market opened at Rs. 10050 per quintal on 23rd June 2020 and closed at Rs. 9400, per quintal.

At Kangayam market in Tamilnadu, the prices opened at Rs. 9000 per quintal and closed at Rs.8500 per quintal with a net loss of Rs.500 per quintal.

It may be noted that the price of milling copra has now fallen below the MSP declared for season 2020. ie, Rs. 9960/- per quintal. Major coconut producing states have approached the Govenment of India with proposals for initiating procurement operations vide MSP.

Weekly price of Milling Copra at major markets (Rs/Quintal)				
	Kochi	Alappuzha (Rasi Copra)	Kozhikode	Kan-gayam
02.05.2020	11100	11000	NR	NR
09.05.2020	10600	10450	NR	9000
16.05.2020	10400	10350	NR	9000
23.05.2020	10200	10250	10050	8850
30.05.2020	9600	9650	9400	8500

Edible copra

Owing to covid-19 national level lockdown the price of Rajapur copra was not reported from Kozhikode market during the period from 1st June 2020 to 20th June 2020. The price of Rajapur copra at Kozhikode market on 23rd June 2020 was Rs. 12600 per quintal and closed at Rs. 11700, per quintal respectively.

Weekly price of edible copra at Kozhikode market (Rs/Quintal)	
02.05.2020	NR
09.05.2020	NR
16.05.2020	NR
23.05.2020	12600
30.05.2020	11700

Ball copra

The price of ball copra at Tiptur market which opened at Rs.10800 per quintal expressed a downward trend and closed at Rs.9000 per quintal with a net loss of Rs.1800 per quintal far below the MSP price of Rs. 10,300/- per quintal for season 2020.

Weekly price of Ball copra at major markets in Karnataka (Rs/Quintal)	
02.05.2020	10800
09.05.2020	10000
16.05.2020	9660
23.05.2020	9400
30.05.2020	9000

*NR-Not reported

Dry coconut

The price of Dry coconut at Kozhikode market opened on 23rd June 2020 is Rs. 10000 per quintal and closed at Rs. 9900 per quintal with a net loss of Rs.100 per quintal.

Weekly price of Dry Coconut at Kozhikode market (Rs/Quintal)	
02.05.2020	NR
09.05.2020	NR
16.05.2020	NR
23.05.2020	10000
30.05.2020	9900

Coconut

At Pollachi market in Tamil Nadu, the price of coconut opened at Rs.12000 per thousand nuts and closed at Rs. 11000 during the month with a net loss of Rs 900 per thousand nuts.

At Bengaluru market, the price of partially dehusked coconut opened at Rs.15000 per thousand nuts and closed at Rs. 16500 during the month with a gain of Rs 1500 per thousand nuts.

Weekly price of coconut at major markets (Rs /1000 coconuts)				
	Nedumangad	Pollachi	Banglore	Mangalore (Grade -1)
02.05.2020	NR	NR	15000	NR
09.05.2020	NR	12000	NR	NR
16.05.2020	NR	NR	17000	NR
23.05.2020	NR	12000	NR	NR
30.05.2020	NR	11000	16500	NR

International price

Coconut

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

Weekly price of dehusked coconut with water				
Date	Domestic Price (US$/MT)			
	Philippines/ Indonesia (CIF Europe)	Indonesia	Srilanka	India*
02.05.2020	NQ	155	NQ	NR
09.05.2020	NQ	158	234	341
16.05.2020	NQ	168	251	NR
23.05.2020	NQ	203	273	NR
30.05.2020	NQ	204	271	315
				*Pollachi market

Coconut Oil

The domestic price of coconut oil in Sri Lanka expressed a mixed trend during the month. While the domestic price of coconut oil in Indonesia expressed an upward trend during the month. The international prices and domestic price of coconut oil in Philippines market and Indian market were not reported during the month.

The price of coconut oil quoted at different international/ domestic markets are given below.

Weekly price of coconut oil in major coconut oil producing countries					
	International Price(US$/MT)	Domestic Price(US$/MT)			
	Philippines/ Indonesia (CIF Europe)	Philippines	Indonesia	Sri lanka	India*
02.05.2020	NQ	NQ	780	NQ	NR
09.05.2020	NQ	NQ	785	2575	NR
16.05.2020	NQ	NQ	825	2633	NR
23.05.2020	NQ	NQ	825	2689	NR
30.05.2020	NQ	NQ	880	2550	NR
					* Kangayam

Copra

The domestic price of copra at Sri Lanka and Indonesia expressed an upward trend and India expressed a downward trend. The price of copra quoted at different domestic markets is given below.

Weekly International price of copra in major copra producing countries				
Date	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India* * Kangayam
02.05.2020	NQ	429	NQ	NR
09.05.2020	NQ	460	1242	1181
16.05.2020	NQ	NQ	1255	1181
23.05.2020	NQ	NQ	1263	NR
30.05.2020	NQ	475	1482	1115