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Articles, research papers and letters on different aspects of coconut cultivation and industry are invited for publication in this Journal. All accepted material will be paid for. The Board does not accept responsibility for views expressed by contributors in this Journal. All remittances and correspondence should be addressed to the Chairman, Coconut Development Board, Kochi - 682 011.

# Coconut Development Board

The Coconut Development Board is a statutory body established by the Government of India for the integrated development of coconut cultivation and industry in the country. The Board which came into existence on 12th January, 1981, functions under the administrative control of the Ministry of Agriculture and Farmers Welfare, Government of India, with its headquarters at Kochi in Kerala State and Regional Offices at Bangalore, Chennai, Guwahati and Patna. There are five State Centres situated in the states of Orissa, West Bengal, Maharashtra and Andhra Pradesh and in the Union Territory of Andaman & Nicobar Islands. DSP Farms are located at Neriyamangalam (Kerala), Vegiwada (Andhra Pradesh), Kondagaon (Chhattisgarh), Madehpura (Bihar), Abhayapuri (Assam), Pitapalli (Orissa), Mandya (Karnataka), Palghar (Maharashtra), Dhali (Tamil Nadu), South Hichachara (Tripura) and Fulia (West Bengal) besides a Market Development cum Information Centre at Delhi. The Board has set up a Technology Development Centre at Vazhakulam near Aluva in Kerala.

## Functions

❒ Adopting measures for the development of coconut industry. ❒ Recommending measures for improving marketing of coconut and its products. ❒ Imparting technical advice to those engaged in coconut cultivation and industry. ❒ Providing financial and other assistance for expansion of area under coconut. ❒ Encouraging adoption of modern technologies for processing of coconut and its products. ❒ Adopting measures to get incentive prices for coconut and its products. ❒ Recommending measures for regulating imports and exports of coconut and its products. ❒ Fixing grades, specifications and standards for coconut and its products. ❒ Financing suitable schemes to increase the production of coconut and to improve the quality and yield of coconut.

❒ Assisting, encouraging, promoting and financing agricultural, technological, industrial or economic research on coconut and its products. ❒ Financing suitable schemes where coconut is grown on large scale so as to increase the production of coconut and to improve its quality and yield and for this purpose evolving schemes for award of prizes or grant of incentives to growers of coconut and the manufacturers of its products and for providing marketing facilities for coconut and its products. ❒ Collecting statistics on production, processing and marketing of coconut and its products and publishing them. ❒ Undertaking publicity activities and publishing books and periodicals on coconut and its products.

The development programmes implemented by the Board under the project Integrated Development of Coconut Industry in India are- production and distribution of planting material, expansion of area under coconut, integrated farming for productivity improvement, technology demonstration, market promotion and Information and Information Technology. Under the Technology Mission on Coconut, the programmes implemented by the Board are development, demonstration and adoption of technologies for management of insect pest and disease affected coconut gardens, development and adoption of technologies for processing and product diversification and market research and promotion.

# Index

# Message from the Chairman's desk

Dear Readers,

I wish to express my sincere gratitude to all the stakeholders in the coconut sector who had made the World Coconut Day celebrations of 2021 a successful event through your active participation. It is highly relevant in the current circumstances to have a dedicated day to celebrate the "Kalpavriksha" whose nutritional and health attributes are getting stronger with each passing day. The World Coconut Day 2021 had the added privilege of being included in the celebrations of Azadi ka Amrit Mahotsav and the Board under the auspices of the Ministry of Agriculture and Farmers Welfare, Government of India celebrated 23rd World Coconut Day in commemoration of the foundation day of the International Coconut Community (ICC). World Coconut Day was also celebrated by the International Coconut Community on the last day of COCOTECH Conference with the participation of 20 member countries and stakeholders from across the globe. India also participated in the celebrations.

Hon'ble Union Minister for Agriculture and Farmers Welfare, Government of India addressed the gathering. He informed the stakeholders that Government of India has a vision to boost the coconut production and productivity as well as the processing and export of coconut and has made remarkable increase in the agriculture budget of the country. The ultimate objectives are to increase the farmer's income and also to generate more employment opportunities, thereby providing livelihood and social security to the various players in the sector. India has made great advancement in the field of coconut cultivation, processing and export. The crop could exercise a commendable impact on the country's economy with efforts oriented towards the development of the sector as a whole and inclusive growth of the farmer.

Coconut Development Board, aimed at the integrated development of coconut farming and associated industry in the country, has always been concerned about the well being of coconut farmers. Through the concerted and consistent efforts of the Board since the last four decades, the sector has ventured into major areas like processing and value addition, manufacturing of novel products, introduction of modern technologies, quality standards and innovative marketing strategies.

It is, in fact, heartening to note that the policy makers are wholeheartedly extending their support and cooperation for the integrated development of the sector for ensuring maximum return to the stakeholders. Board will continue its efforts for the betterment of the millions of small and marginal coconut farming community in the country and will formulate more viable programmes beneficial to the various needs of the coconut sector.

Rajbir Singh IFS
Chairman


# India is the world leader in coconut production and productivity

## Quality of the products in line with global standards will boost export

## Shri Narendra Singh Tomar

Coconut Development Board under the auspicious of the Ministry of Agriculture and Farmers Welfare, Government of India celebrated 23rd World Coconut Day to commemorate the foundation day of the International Coconut Community (ICC) on 2nd September 2021. The theme for the World Coconut Day celebrations this year was "Building a safe, inclusive resilient and sustainable coconut community amid Covid-19 pandemic and beyond".

Shri Narendra Singh Tomar, Hon'ble Union Minister for Agriculture and Farmers Welfare, Government of India delivered the key note address during the occasion. He informed the stakeholders that Government of India's vision is to boost the coconut production and productivity as well as the processing and export of coconut in the country. The government has made remarkable increase in the agriculture budget of the country. The ultimate objectives are increasing the farmer's income and generating more employment opportunities, thereby providing livelihood and social security to the various players in the sector. India has made great advancement in the field of coconut cultivation, processing and export. The crop could exercise a commendable impact on the country's economy with efforts oriented towards the development of the sector as a whole and inclusive growth of the farmer


The vision of our Hon'ble Prime Minister, Shri Narendra Modi is that the income of our farmers should be increased and they should be the leading force in agriculture sector. Our agriculture products should meet such quality standards that the major chunk of world's requirement in view of export can

be fulfilled by the country by adhering to the global standards which will increase exports. Government of India is focussing on increasing the production and productivity of coconut and realising remunerative price for coconut farmers. CDB is also making efforts to achieve this goal. Schemes are being formulated to protect coconut farmers from natural calamities. Coconut processing sector is gaining momentum in our country. As a result of this, coconut farmers are getting better price for their products. We have to come up with a clear vision and objective so that by adopting improved cultivation practices in the coconut growing tracts, production can be increased and the processing sector can be strengthened. Hence, it is the need of the hour to widen the reach of the Technology Mission on Coconut programme. This sector was neglected to some extent since long. However, the Government of India is adopting measures to ensure that such negligence should not happen in future. He assured that the Government will take every possible effort to transform this sector to be more beneficial for farmers so that more employment opportunities can be created.

Union Minister of State for Agriculture & Farmers Welfare, Sushri Shobha Karandlaje who addressed the farmers on the occassion said that since most of the coconut farmers are small and marginal, the future of our domestic coconut industry lies in our ability to aggregate and pool farm level coconut production, take up processing and value addition for better income realization and give major thrust to product diversification and findings in industrial utilization of various by-products and their value addition.

Union Minister of State, Shri Kailash Choudhary also addressed the farmers. In his address, he said that as per the vision of Prime Minister Shri Narendra Modi, the government is providing benefits to coconut growers to increase their income. The central government is dedicated to the farmers and the agriculture sector is given priority, that is why the agriculture budget has also been increased significantly. A large number of farmers will also be entitled for more facilities through Farmer Producer Organizations (FPOs).

Shri Sanjay Agarwal, Secretary, Ministry of Agriculture and Farmers Welfare also spoke during the occasion. Shri Rajbir Singh, Joint Secretary, Agriculture and Farmers Welfare and Chairman , Coconut Development Board in his introductory remarks made a presentation on the coconut situation in India and functions and schemes of the Board. 500 progressive farmers from across the country, entrepreneurs, exporters, senior officials from the Ministry and the Board and officers of various State Horticulture Missions participated in the function. Smt. Deepthi Nair S, Deputy Director, CDB proposed vote of thanks.

A technical session was also organized for the coconut growing farmers wherein Dr. Joseph Rajkumar, Principal Scientist, ICAR-CPCRI, Regional Station, Kayamkulam, Kerala spoke on Recent Advances in Pest Management in Coconut and Dr. Venugopalan V.V, Senior Principal Scientist & Head, Agro Processing and Technology, CSIR –NIIST, Thiruvananthapuram, Kerala spoke on Prospects of Value Addition of Coconut Water. Famers raised their doubts in the Interactive session which was clarified by the experts.

Abstract of the technical paper presented during the technical session

# Advances in pest management in coconut system

**A. Joseph Rajkumar, Principal Scientist (Agrl. Entomology),**
ICAR-CPCRI, Regional Station, Kayamkulam, Kerala, INDIA

Dynamism of pests attacking coconut is ever increasing realizing action threshold many a times diminishing palm productivity and threatening livelihood security. Living with pests is, thus, gaining momentum for sustaining coconut yield and safeguarding environment considering the perennial and homestead nature of palms. Bionomics, geo-maps and bio-intensive area-wide management of key pests of coconut viz., rhinoceros beetle, red palm weevil, black headed caterpillar, eriophyid mite, white grubs and rodents as well as emerging pests such as coreid bug, slug caterpillars, exotic whiteflies including the invasive rugose spiraling whitefly (Aleurodicus rugioperculatus), non-native nesting whiteflies (Paraleyrodes bondari, Paraleyrodes minei), Palm whitefly (Aleurotrachelus atratus) are lucidly presented with all cutting-edge eco-friendly technologies to counter their menace. The potential invasive pests such as Brontispa longisimma, Aspidiotus rigidus, and Wallacea jarawa are underscored with strategies on emergency preparedness, streghtening quarantine options and incursion management. Biorational approaches and health management of palms are greatly emphasized to suppress pests in the most economical and convincing manner. Good agricultural practices, agro-ecosystem based stimulo- deterrent strategies by crop pluralism, semio-chemical tools, diversity farming methods, ecological intensification, farmer-participatory community approaches including farmer field school mode to empower farmers with all innovative pest management actions towards harnessing sustainable palm yield in all coconut growing regions of the country are accentuated targeting doubling farm income. Environmentally responsible farming particularly in the fragile perennial system of palms will be greatly advocated with one-health concept caring the health of plants, animals include insects as well as environment through ecological intensification process.

# Technologies for value addition of coconut water and other byproducts

**Dr. Venugopalan V V**, Principal Scientist, Agro processing Technology Division, National Institute for Interdisciplinary Science and Technology, Trivandrum

Agroprocessing Technology Division of CSIR NIIST has many post harvest technologies for value addition of various agri crops and most of them were commercialized through technology transfer & project implementation. Coconut is one of the major thrust areas of research and we have continuous interface with leading industries in this sector where the institute is continually supporting them with R& D interventions in product development, process related issues, detection mechanisms for oil adulteration, scientific validation of coconut related products such as virgin coconut oil etc.

The institute also has developed technologies on preservation and value addition of matured coconut water with the financial support from Coconut Development Board. Matured Coconut water (MCW) is a byproduct in all coconut related industries, which is rich in energy sources and can be consumed as a drink. There are plenty of coconut producing companies in Kerala, but the coconut

water generated from these units is currently being disposed without sales realization . In this context a sponsored project was undertaken through financial support from Coconut development Board to develop technologies for *in situ* preservation and value addition of coconut water. A pre processing and rapid chilling mechanism was developed by design and installation of a prototype unit through which the coconut water can be filtered and make turbid free and then cooled to $4^0$C and preventing rapid spoilage. A variety of value added products were also be developed using this water such as Coconut water concentrate, concentrate mix with fruit juices, coconut water coffee, ready to drink powder based on coconut water etc. The process was demonstrated before some user industries for commercialization.

The institute is also have technologies related to the development of dietary fiber from compressed coconut residue from virgin coconut oil industry. The product is enriched source of protein and dietary fiber which can be used as nutritional supplement.

The Institute has developed biodegradable plates & cutleries, glass, straw, spoons etc from coconut byproducts ie residue after milk extraction. These products will be used as alternatives to single use plastics and also developed value added products from Coconut and palm Neera in concentrated form.

# Status paper of Coconut Development Board, DSP Farm, Kondagaon

**Ishwar Chandra Katiyar,** Farm Manager &
**N. Suruli muthu,** Field officer, CDB DSP Farm, Kondagaon

## Demonstration cum Seed Production Farms

Coconut Development Board has established 11 Demonstration cum Seed Production Farms across the country in various agro climatic zones. The farms serve as demonstration centres of coconut cultivation and also as production centres of quality coconut seedlings suited to the locality. This article series familiarizes activities undertaken at various DSP Farms over years. DSP Farm Kondagaon, Chattisgarh is one of the best performing farms in terms of recorded production and productivity and also in other activities. Even though the farm is situated in a non-traditional belt of coconut cultivation, it has performed at its best during the year 2020-21 and sets an exemplar of success for large scale coconut cultivation in the area. The farm being in a tribal belt of the country, aids in improving the livelihood of the farming community through dissemination of knowledge on coconut cultivation.

The Demonstration cum Seed Production (DSP) Farm, Kondagaon established in the year 1987 is situated three km away from Kondagaon town and about 225 km far from Raipur, capital of Chhattisgarh state. This farm in 40 ha. is planted with different coconut cultivars and various other annual and perennial inter and mixed crops.

The present palm population of the farm is 5306 coconut palms with 3625 Tall, 936 Dwarf, 495 Hybrid and 250 Exotic varieties. 4028 different cultivars of coconut palms are in the yielding stage now of which 1637 high yielding palms are selected as mother palms (Table 1).

### Soil & Climate

Success of coconut farming is mostly determined by favourable climatic factors and among the climatic factors, rainfall plays an important role in increasing the productivity of coconut.DSP Farm, Kondagaon is having favorable soil types like sandy, sandy loam, red soil, lateritic and clayed sandy soils. The soil pH ranges between5.5 and 6.3 and the farm is situated under favourable climate conditions with the temperature ranging between $7^0$C to $42^0$C. The average rainfall is 1250mm per year.

### Coconut Plantation

The farm is divided into 22 blocks and each block is planted with different cultivars of coconut by adopting different planting systems for demonstration purpose.

**Table - 1: Coconut cultivars planted in the farm**

| Cultivars | Variety | No of Existing palms |
|---|---|---|
| Tall | WCT, ECT, TT, B.Tall, AO, AG, LO | 3625 |
| Dwarf | MOD, MGD, MYD, COD, CGD, Gangabondam | 936 |
| Exotics | Bastar Tall, Pillalycode, Spikeless, Phillipines Tall, Sandramon, FMS, Fiji Tall, Cylon Tall, Zanziberra Tall, Jamaica Tall, Kenya Tall and Bornea | 250 |
| Hybrids | D X T and T X D | 495 |
| | **Total:-** | **5306** |

### Planting System

Various planting systems like square system, rectangular system, triangular system, single hedge system and double hedge system are adopted in the farm.

### Cultivation Practices

The Farm is following recommended scientific methods of practices throughout the year depending upon the climatic conditions.

**April – May :** Since this is the peak summer season, coconut basins are mulched with dried coconut leaves and coconut husk. Poly sheet mulching is also done in the farm for reducing weed

West Coast Tall

Malayan Orange Dwarf

Malayan Yellow Dwarf

Gangabondam

East Coast Tall

T X D Hybrid

growth. Basin irrigation, prophylactic fungicide spraying and frequent monitoring and management against pestvs and diseases are undertaken during the month. First harvesting of matured coconuts and collection of seed nuts from selected mother palms for sowing in the nursery is also done during this period.

**June - July :** Coconut basins are cleaned by weeding and are kept ready for application of 1st split dose of chemical fertilizer to coconut and other intercrops in the farm. Second harvest of matured coconut and collection of seed nuts from selected mother palms for sowing in the nursery are started during the period

**August – Sept :** Harvesting of vermi compost and applying to coconut and intercrops, subsequent application of 1st split of chemical fertilizers, purchase of FYM/compost and its application, third harvest of matured coconut and collection of seednuts from selected mother palms for sowing in the nursery are done during the period

**October - Nov :** Opening of basin and basin irrigation to coconut and management of pest and disease attack is done during the period. For avoiding termite attack on coconut trunks, application of lime is also undertaken during the period.

**Dec - Jan :** Continuing basin irrigation to coconut, coconut nursery, application of lime, fourth harvesting of matured coconut and collection of seed nuts from selected mother palms for sowing in the nursery are done during this period.

**Feb –March :** Cleaning of coconut basin, mulching with dried coconut leaves and coconut husk, poly sheet mulching, irrigation to coconut and coconut nursery, fifth harvest of matured coconut and collection of seed nuts from selected mother palms and for sowing in the nursery are done during this period.

Besides the routine operational works, 200 rain water harvesting trenches measuring 4m x 0.75m x 0.5 m were opened in different places of coconut plantation covering all plots during 2019-20. These trenches were gradually filled with coconut debris and other plant parts for production of *in situ* organic manures and to facilitate water storage.

During every winter season from November to February lime is applied in the form of white washing to coconut trunk for avoiding termite attack and also for keeping the palms cool.

From table (2) it is clear that hybrid varieties perform better than tall varieties. The performances of dwarf varieties were observed as satisfactory.

Table - 2

**Variety wise coconut Harvest from** 2016-21

| Year :- | | | | 2016-17 | | 2017-18 | | 2018-19 | | 2019-20 | | 2020-21 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sl.no. | Variety | Existing Palms | Yielding Palms | Production (No of nuts) | Per palm productivity | Production (No of nuts) | Per palm productivity | Production (No of nuts) | Per palm productivity | Production (No of nuts) | Per palm productivity | Production (No of nuts) | Per palm productivity |
| TALL | | | | | | | | | | | | | |
| 1. | WCT | 1432 | 720 | 38810 | 53.90 | 40535 | 56.30 | 25101 | 34.86 | 41284 | 57.33 | 54076 | 75.11 |
| 2. | ECT | 872 | 931 | 52533 | 56.43 | 38566 | 41.42 | 20733 | 22.27 | 40071 | 43.04 | 62320 | 66.94 |
| 3. | TT | 728 | 703 | 40874 | 58.14 | 25014 | 35.58 | 15864 | 22.57 | 31706 | 45.10 | 49875 | 70.94 |
| 4. | AG | 26 | 23 | 1458 | 63.39 | 631 | 27.43 | 552 | 24.00 | 690 | 30.00 | 957 | 41.60 |
| 5. | B.Tall | 121 | 61 | 1304 | 21.38 | 480 | 7.87 | 950 | 15.57 | 4183 | 68.57 | 4307 | 70.60 |
| 6. | AO/LO | 446 | 161 | 2807 | 17.43 | 2903 | 18.03 | 3589 | 22.29 | 13356 | 82.95 | 19508 | 121.16 |
| 7. | Exotics | 250 | 218 | 4652 | 21.34 | 2223 | 10.20 | 3545 | 16.26 | 9163 | 42.03 | 11575 | 53.09 |
| **Sub Toal:-** | | **3875** | **2817** | **142438** | **50.56** | **110352** | **39.17** | **70334** | **24.97** | **140453** | **49.85** | **202618** | **71.92** |
| **DWARF** | | | | | | | | | | | | | |
| 1. | MOD | 258 | 230 | 8883 | 44.86 | 3907 | 19.73 | 3538 | 17.87 | 11706 | 50.89 | 5751 | 25.00 |
| 2. | MGD | 163 | 152 | 7425 | 60.86 | 3126 | 25.62 | 4983 | 40.84 | 8392 | 55.10 | 8207 | 53.99 |
| 3. | MYD | 232 | 183 | 4995 | 21.53 | 1513 | 6.52 | 2530 | 10.91 | 5465 | 29.86 | 4308 | 23.54 |
| 4. | CGD | 74 | 46 | 2920 | 83.43 | 885 | 25.29 | 942 | 26.91 | 2558 | 55.60 | 2920 | 63.47 |
| 5. | COD | 47 | 35 | 2564 | 42.73 | 745 | 12.42 | 615 | 10.25 | 899 | 25.68 | 552 | 15.77 |
| 6. | GB | 162 | 128 | 5806 | 45.72 | 2247 | 17.69 | 2847 | 22.42 | 5230 | 40.85 | 3383 | 26.42 |
| **Sub Total:-** | | **936** | **774** | **32593** | **42.11** | **12423** | **16.05** | **15455** | **19.97** | **34250** | **44.25** | **25121** | **32.45** |
| **Hybrids** | | | | | | | | | | | | | |
| 1. | D X T | 172 | 132 | 14935 | 113.14 | 5158 | 39.08 | 9140 | 69.24 | 11907 | 90.20 | 8742 | 66.22 |
| 2. | T X D | 323 | 305 | 16317 | 53.50 | 8527 | 27.96 | 10543 | 34.57 | 20422 | 66.95 | 20251 | 66.39 |
| **Sub Total:-** | | **495** | **437** | **31252** | **71.51** | **13685** | **31.32** | **19683** | **45.04** | **32329** | **73.97** | **28993** | **66.34** |
| Grand Total:- | | **5306** | **4028** | **206283** | **51.21** | **136460** | **33.88** | **105472** | **26.18** | **207032** | **51.39** | **256732** | **64.48** |


Mango Fruits


Pine apple Fruits


Lichi Fruits


Black pepper rooted cuttings


Cinnamon Plants


Cocoa Plants


Coffee Plant

Basin making

Mulching with coconut leaves

Mulching with coconut husk

Poly sheet Mulching

Application of fertilizer

## Intercropping

Interspaces of coconut plantations provide ample scope for intercropping and about 70 – 75% of the plantation is utilized for cropping system. Intercropping helps in better utilization of interspaces and improve the soil fertility and also help in realizing maximum income from unit area (Table : 3).

**Table: 3 - Intercropping**

| Name of the intercrops | No of existing plants |
|---|---|
| Mango | 290 |
| Lichy | 45 |
| Black pepper | 133 |
| Cashew | 117 |
| Coffee | 177 |
| Pineapple | 840 |
| Guava | 105 |
| Acid lime | 71 |
| Cocoa | 3700 |
| Cinnamon | 450 |
| **Total** | **5928** |

With these perennial, annual and some minor intercrops the Farm could generate additional income other than the main crop, which was between Rs.3.00 lakh and Rs.5.00 lakh per year.

## Commercial coconut nursery attached to DSP Farm

Every year coconut seedlings are produced in the Farm under the scheme Regional coconut nursery. Different varieties of seed nuts are collected from the harvested nuts from the selected mother palms (Table: 4). Produced coconut seedlings are distributed to the coconut farmers of Bastar and other regions of Chhattisgarh state under the Area Expansion Programme. The seedlings are also sold to farmers.

**Table: 4 -Seednuts sown in nursery 2016-21**

| Year | Own nuts selected | Seed nuts procured from out side | Total nuts sown |
|---|---|---|---|
| 2016-17 | 56600 | 69100 | 125700 |
| 2017-18 | 20630 | 38200 | 58830 |
| 2018-19 | 24550 | 11000 | 35550 |
| 2019-20 | 47000 | ---- | 47000 |
| 2020-21 | 50515 | ---- | 50515 |
| Total | 199295 | 118300 | 317595 |

## Organic Manure Unit

There are three vermicompost production units in the farm with the capacity to produce 105 tons of vermicompost (Table: 5).

**Table 5: Organic Manure Units**

| Plot No. | Unit size (Mt) | Volume (m3) | No of tanks | Total Volume of the units (m3) |
|---|---|---|---|---|
| 07 | 3.5 x1.5 x 0.75 | 3.94 | 4 | 15.76 |
| | 15 x 1.5 x 0.75 | 16.88 | 1 | 16.88 |
| 13 | 15 x 1.5 x 0.75 | 16.88 | 4 | 67.52 |
| | Total:- | | 9 | 105.16 |

Coconut based vermi compost is produced by utilizing coconut leaves and other parts of coconuts like dried inflorescence.

Vermi compost is applied to coconut and other perennial fruit crops like mango, litchi, pine apple

etc. Vermi compost is playing a vital role in fulfilling the availability of nitrogen for coconut palms and changes soil structure in the coconut basin for easy infiltration of roots. The yield of coconut and intercrops gradually increased through the application of vermi compost subsequent to the application of chemical fertilizers.

## Shade house

A shade house measuring 15 m length and 7.5 m width is also maintained in the farm for production of horticulture planting materials like black pepper rooted cuttings, cinnamon saplings, coffee seedlings, cocoa seedlings, litchi air layered cuttings, acid lime air layered cuttings etc. Every year around 3000 black pepper rooted cuttings, 3000 cinnamon saplings, 500 coffee seedlings, 1000 cocoa seedlings, 200 – 300 litchi air layered cuttings and 100 -200 acid lime air layered cuttings are being produced and sold to the farmers of Bastar.

Farm is generating an income of around Rs. 50,000 to Rs. 1,00,000 from horticulture planting material sale and the expenditure for the same is only around Rs.10,000 to Rs. 15,000.

## CDB Schemes implemented in the Farm

DSP Farm, Kondagaon is implementing various schemes of the Board like Area expansion programme for expansion of area under coconut, Laying out of Demonstration Plots for improvement of production and productivity of coconut for increasing income of the coconut farmers, Skill development programmes like farmers training programme for coconut farmers on cultivation aspects, Palm climbing training programme for unemployed youths under Friends of Coconut Tree (FoCT) programme etc (Table: 6).

## Area Expansion Programme

DSP Farm, Kondagaon is implementing Area Expansion Programme for expansion of area under coconut in Chhattisgarh state. Good quality coconut seedlings produced in the Farm are distributed to coconut farmers. The details of the coconut seedlings distributed through this scheme during the last five years are given in table 7.

**Table 7: Coconut Seedling production 2016-21**

| Year | No of coconut seedlings produced. |
|---|---|
| 2016-17 | 114506 |
| 2017-18 | 74568 |
| 2018-19 | 36640 |
| 2019-20 | 17392 |
| 2020-21 | 30000 |
| Total:- | 273106 |

**Table: 6: CDB Schemes implemented in the Farm**

| YEAR | Subsidy period | No of beneficiaries | Area (Ha) | No of coconut plants distributed | Subsidy Amount (Rs) | Category wise beneficiaries. |
|---|---|---|---|---|---|---|
| 2016-2017 | 1st year | 125 | 64.56 | 10942 | 373000.00 | ST-80, OBC-30, GEN-15 |
| | 2nd year | 25 | 12.44 | 1985 | 46000.00 | ST-25 |
| | Total:- | 150 | 77.00 | 12927 | 419000.00 | |
| 2017-2018 | 1st year | 157 | 89.10 | 15593 | 535000.00 | ST-157 |
| | 2nd year | 125 | 64.56 | 10942 | 373000.00 | ST-80, OBC-30, GEN-15 |
| | Total:- | 182 | 73.47 | 26535 | 906000.00 | |
| 2018-2019 | 1st year | 371 | 101.13 | 17698 | 683000.00 | ST-337, SC-3,GEN-31 |
| | 2nd year | 157 | 76.12 | 13321 | 309000.00 | ST-157 |
| | Total:- | 528 | 177.25 | 31019 | 992000.00 | |
| 2019-2020 | 1st year | 43 | 18.16 | 3178 | 103000.00 | ST-28, GEN-15 |
| | 2nd year | 208 | 62.36 | 10913 | 157000.00 | ST-193, SC-3, GEN-12 |
| | Total:- | 251 | 80.52 | 14091 | 260000.00 | |
| 2020-2021 | 1st year | 159 | 55.92 | 8948 | 386292.00 | ST-128,SC-1, GEN-30 |
| | 2nd year | Implementation in progress | | | | |
| | Total:- | 159 | 55.92 | 8948 | 386292.00 | |

Tall Coconut Nursery


Poly bag Dwarf

## Laying out of Demonstration Plots

The scheme LoDP is implemented in the districts of Kondagaon, Narayanpur, Bakhawand and Jagdalpur. Since this scheme is implemented on cluster basis by the Board, the Farm collected the village wise list of farmers and palms regulating it into cluster form and implemented the Scheme.

## Krishi Kalyan Abhiyan

Through this programme in 2018-19, coconut seedlings were distributed to farmers families @ 5 plants to 4000 families of different categories like ST,SC,OBC and General in 17 villages of Kondagaon and Bastar districts.

## Friends of Coconut Tree (FoCT)

The skill development programme of the Board, Friends of Coconut Tree was conducted by the farm by providing palm climbing training to unemployed agricultural youths for generating employment. The Farm has given training to 280 unemployed youths in Chhattisgarh state (Table : 8).

**Table 8: Friend' of Coconut Tree (FoCT)**

| Year | | No of trainees category wise | Total No of trainees |
|---|---|---|---|
| 2016-17 | 4 Batches | ST-67, OBC-13 | 80 |
| 2017-18 | 8 Batches | ST-155 , OBC-5 | 160 |
| 2020-21 | 2 Batches | ST-36, OBC-4 | 40 |
| Total:- | 14 Batches | ST-258, OBC-22 | 280 |

## Extension Activities

### *Field level Farmers Training*

Under Field level Farmers Training programme coconut farmers are given training on cultivation of coconut plantation by following scientific methods. The trainees are given practical training in the farm in coconut cultivation and in raising coconut nursery.

### *Hybridization Programme*

Hybridization programme was also conducted in the farm for production of hybrid seed nuts and seedlings. Some of the labourers were given training in hybridization techniques at CDB, DSP Farm,Mandya. Hybridization was done in the selected mother palms.

The Farm is committed in increasing its productivity and seedling production in the coming years for the betterment of the coconut farmers of the region ■

Young Coconut Seedlings

Poly bag Hybridized seedlings

Coffee saplings in Green shade House

Black pepper rooted cuttings

Organic Manure Unit in plot-07

# Riding on coconut to reach the destination of sustainability

**Deepthi Nair S,**
Deputy Director, CDB, Kochi -11

The Coconut Community across the globe were going nuts over coconut during the last week of August; the global celebrations of World Coconut Day on September 2nd was not the reason and all talks were leading to the wonder crop, be it cultivation or processing or trade or health benefits of coconut. This was the stage set during the launch of the COCOTECH Conference which was organized by the International Coconut Community (ICC) as a virtual event during 30th August to 2nd September 2021.

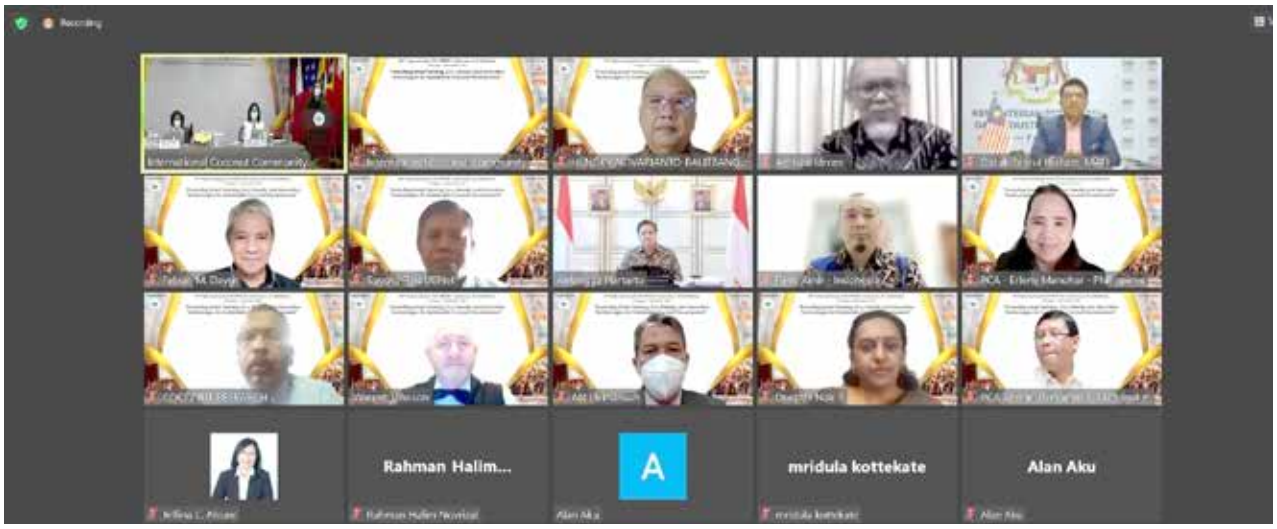
COCOTECH, organized once in two years by ICC, is an event that the stakeholders in the global coconut sector look forward to, since it brings together the experts across the globe and sharing of technologies, ideas, market prospects etc occur to the benefit of the stakeholders. The 49th International COCOTECH Conference and exhibition was organized virtually from Jakarta on the theme : Promoting Smart Farming, Eco-Friendly and Innovative Technologies for Sustainable Coconut Development. The theme was well in accordance with the Sustainable Development Goals.

Since the Conference was organized virtually owing to the pandemic situation, it also enabled increased participation from across the globe. Around 742 stakeholders from the global coconut sector had participated in COCOTECH Conference from around 43 countries, the highest numbers ever recorded in COCOTECH. And indeed it is really great to know that so many people are interested in coconut. The exhibition organized alongside COCOTECH was also an eye opener for many since it showcased various products from coconut; the products in display came from around 45 firms across 9 countries.

Indonesia being host to the ICC led the start of the Conference with key note address and opening remarks delivered by His Excellency Honourable Airlangga Hartarto, MBA M.M.T. IPU, Coordinating Minister of Economic Affairs of the Republic of Indonesia The programme was arranged in seven sessions with each session concentrating on one topic of utmost priority to the sector.

***Session 1 : Policies & Programs Promoting Sustainable Coconut Development***

The session was intended to create awareness about the policies and programmes implemented in the major coconut growing countries for promoting sustainable coconut development. This session is always found useful for policy makers and development officials who can replicate ideas implemented successfully after suitable fine tuning of the same with the local scenario. The first paper was presented on the National Program and Policies for the Sustainable Coconut Development in the Philippines by Mr. Benjamin R. Madrigal Jr., Administrator, Philippines Coconut Authority, Philippines. He presented the outlook envisaged for the coconut sector and the seven thematic recommendations towards a resilient, secure, sustainable and globally competitive coconut industry with empowered and prosperous farmers. He explained about the Farmers registry and its updation undertaken in the Philippines. He gave a brief outline on the developmental activities undertaken for the coconut sector in the Philippines. This was followed by a presentation on the "Strengthening National Program on Coconut Revitalization in Indonesia" by Dr. H. Syahrul Yasin Limpo, S.H. M.Si, M.H., Minister of Agriculture, Republic of Indonesia. The policy initiatives for the plantation sector in the country was explained in detail which included the 1000 cultivation village, production acceleration and added value strategy and Coconut Area Corporate Development Concept. The increasing potential and prospects for the coconut industry should be matched with sustained supply of raw material in adequate quantity and quality. The third presentation was on "Managing Coconut Supply Stability, Cost and Quality in a Smart Farming System" which was presented by Mrs. Deepthi Nair.S., Deputy Director, Coconut Development Board, India. The importance of sustainable coconut development and the need to maintain supply stability, managing cost and quality so as to cope up with the increasing demand from industry was explained.

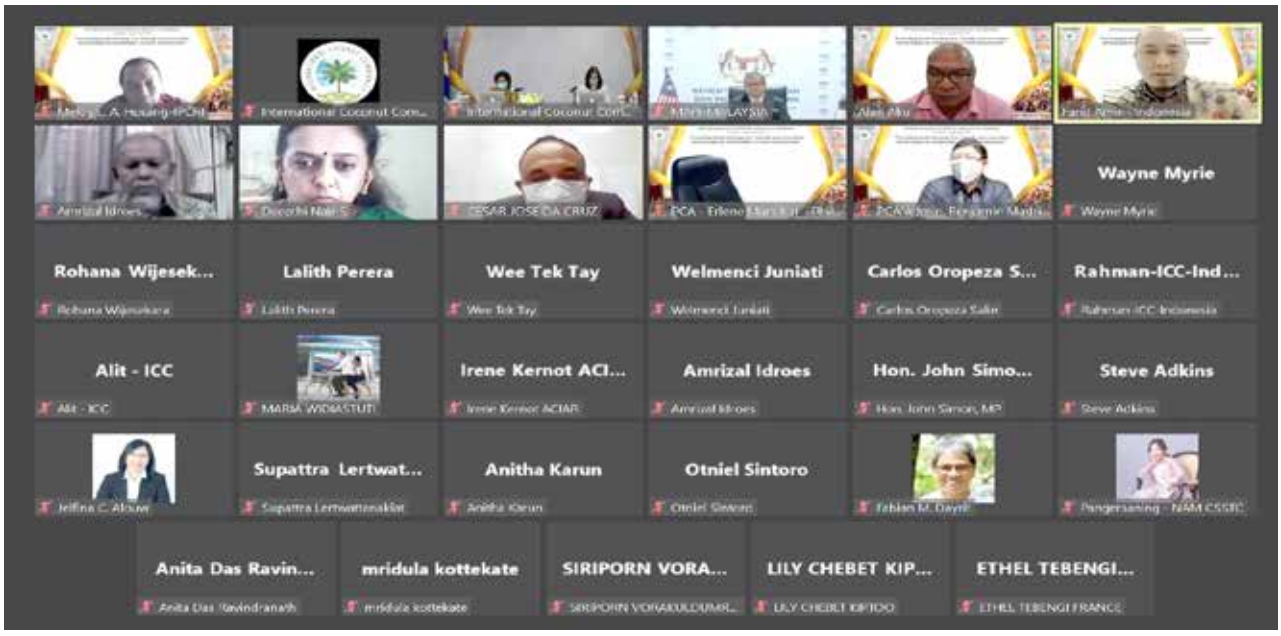



***Session 2 : Recent Scientific Evidence on Health Benefits of Coconut Based Products***

The needs of the market and the consumers are increasing with every passing day. Health claims on consumer products cannot be justified with anecdotal evidences but need to be supported by scientific evidences. The topic presented by Dr. Fabian M. Dayrit, Professor, Department of Chemistry, Ateneo de Manila University and Chairman ICC Scientific Advisory Committee on Health, Manila, Philippines was very much apt for the times in which we are living now – "Does Coconut Oil Have a Role against Covid-19?" Dr. Dayrit started by explaining the uneven and uncertain Covid situation. The pharma strategy against Covid comprises mainly of antiviral strategy through repurposed drugs, immunity through vaccines and anti-inflammatory strategy through steroids. He detailed on the scientific studies undertaken on effectiveness of VCO in lowering the C reactive protein levels and other health benefits. He further explained the stages in which VCO could provide positive benefits and detailed about the ICC solidarity trial. Dr. Ralph Martins, Foundation Professor and Inaugural Chair in Ageing and Alzheimer's Disease, School of Medical Science, Australia presented "Updates on Coconut-Based Products and Alzheimer's Disease". He explained the trials undertaken using MCT oil from coconut, the assessments studied including cognitive and the improved results obtained. Mr. Shashank Garg, GEMTECH Projects LLP, Kolkata, India gave a brief overview about the processing of coconut through a video and presented about the various machinery for coconut processing produced by his firm.

***Session 3: Enhancing Competitiveness of Coconut Base Products in the Era of Volatility, Uncertainty, Complexity and Ambiguity (VUCA)***

Quality, traceability, certification, trade integration etc are crucial in today's marketing scenario due to increasing competitiveness and innovation. The market is very much volatile and uncertain and the preferences change fast and have little life which makes innovation and convenience the major requirements to sustain in the business. "Importance of Quality Standards and Product Certification for Potential Marketing of Coconut Products" was the first topic in this Session which was presented by Dr. C. Anandharamakrishnan, Director, Indian Institute of Food Processing Technology (IIFPT), Ministry of Food Processing Industries (MoFPI), Government of India. He explained the growth potential for value added products of coconut and the relevance of quality adherence for the processed products. He stressed the need for risk assessment in the production chain and explained the various quality standards and certification systems currently in vogue. The next presentation on "Coconut Oil as Feedstock of SAP (Sustainable Aviation Fuel): Potential, Challenges and Strategies for Future Development" by Dr. Suyoto Rais, Chairman, Indonesia-Japan Business Network, Jakarta was indeed a revelation to the participants of an added use of coconut oil as aviation fuel, which was totally an out of the box thought. He explained that the efforts were oriented towards reduction of carbon dioxide emissions in aviation industry which included sustainable aviation fuel too. He explained the suitability of coconut oil as aviation fuel and suggested that the rejections by processing units or non-standard coconuts could be used.




The relevance of organic certification in the path of sustainability is becoming increasingly significant. The talk on "Organic Coconut Plantation and Products: Challenges and Opportunities to Enhance Competitiveness in Global Market" was presented by Mr. Gerd Waldkircher, PT. Bionesia Organic Foods, Indonesia. He explained the importance of organic farming and the certification process. The market potential for organic products of coconut in the near future was also discussed. Ms. Witada Anukoonwattaka, Economic Affairs Officer, Trade Policy & Facilitation Section, Investment & Innovation Division UNESCAP presented on "Online Tool for Visualizing and Analyzing Trade Integration (RIVA Value Chain Analysis) " which was an interesting area especially for those in trade. She gave a good understanding on Regional Integration and Value Chain Analyser (RIVA) and how to know the involvement of a country in the global value chain. She presented a demonstration on the use of RIVA in marketing decisions which was very informative to all in decision making.

***Session 4 : Advanced Technologies for Supporting Adequate Supply of Raw Materials to Meet Current and Future Demand for Coconut Based Products***

Rapid multiplication techniques in coconut is yet to reach a phase where millions of plantlets of good quality could be distributed. Discussions and deliberations on where each country stands in research in in-vitro-propagation is important to prevent countries making investments in kind and human resource for re-inventing the wheel. "Clonal Propagation of Elite Coconut Cultivars using Axillary invitro Shoot Multiplication" was the topic in which Dr. Bart Panis, Senior Scientist, Alliance of Bioversity International CIAT, Belgium made his presentation. He briefed on the project undertaken from shoots of germinating embryos where embryos were sourced from Philippine Coconut Authority. He explained the advantages of the method and the way forward. The talk on "Potency and Challenges of Coconut Micropropagation" was presented by Dr. Steve W. Adkins, Expert in Plant Physiology, Queensland, Australia. He gave a brief picture of the history of coconut micropropagation and the various pathways followed. The issues identified including tissue browning, inefficient proliferation and low regeneration were discussed. He stressed on the need to identify varieties to be propagated based on the end use.

Dr. Carlos M. Oropeza Salin, Senior Researcher, Centro de Investigación Científica de Yucatán (CICY), Mexico presented on the topic "Coconut Micropropagation: Strategy to Meet Global Demand". HE explained the micropropagation protocol undertaken by CICY which was implemented in field and the plants have started fruit setting. He called for regional collaboration in order to attain self sufficiency in planting material production. The topic "Prerequisite for the Success of Coconut Micro Propagation Through Tissue Culture" was presented by Dr. Anitha Karun, Acting Director and Breeder, ICAR- Central Plantation Crop Research

Institute (CPCRI), Kerala, India. She explained in detail about the work undertaken in tissue culture and the various possibilities explored which include coconut zygotic embryo culture, plumule culture, anther culture, unfertilized ovary culture, embryonic shoot meristem culture etc and tissue culture with large inflorescence and immature inflorescence. She conclude with the brief account of the determinants contributing to the success of tissue culture. This was followed by a brief presentation by Mr. Viraj Bagaria, Director, T & I Global, Coimbatore, India on the various coconut processing machinery and equipments manufactured by them.

***Session 5 : Strategies for Ensuring Sustainable Demand for Coconut as Functional Foods, Nutraceutical, Pharmaceutical, Cosmeceutical and Environmental Friendly Products***

Coconut is no longer an oil crop since its multifaceted uses are being put into various applications, mainly in health, beauty care, nutrition, environment friendliness etc. The session was very relevant under these circumstances and the stakeholders got an idea about the market outlook through the presentations in this session. The first topic " Outlook of Coconut Products Market Demand" was presented by Mr. Tomas B. Medina, President & CEO, Brand Exports, Philippines who gave an outlook on the coconut products in the global market, major players, major markets and importing countries and the predicted CAGR for the various coconut products. The talk on "Coconut Flour as a Functional Food/ Ingredient: Future Perspectives" was presented by Dr. Domina Esther Mbela Nkuba, Senior Research Officer, Tanzania Food and Nutrition Centre (TFNC), Tanzania. She presented in detail on the nutritional composition of coconut flour, method of preparation, health benefits, and future perspectives of functional coconut flour. "Challenges and Prospects in the sector of Coconut Shell Charcoal Activated Carbon and Coconut Shell Charcoal" was presented by one of the pioneers in the global activated carbon sector globally, Mr. Yves Debayles, President Asia, Jacobi Carbon, Singapore. He reiterated the fact that activated carbon has emerged as an essential industry with applications from drinking water treatment and gold mining to super capacitors. The prospects for activated carbon is very promising not only from the water purification market but also increased demand from crisis proof industries like pharma, food, personal protection, gold mining etc. Dr. Anita Das Ravindranath, Former Director, Central Coir Research

Institute (Coir Board), Ministry of Micro Small and Medium Enterprises, India presented on the topic – "Processing of Coir and Coir Based Products and its Market Potential - Indian Scenario". She explained the increasing demand for natural fibres and its varied uses in textiles, agrotech, buildtech, clothtech by blending with other fibres, geotech, packtech, hometech, garden articles etc. The advantages of coir wood and uses of coir composites was explained and the Ecomark certification system was detailed.

***Session 6 : Smart Farming and Adaptation Strategies to Climate Change for Sustaining Coconut Production and Increasing Farm Productivity***

Mrs. Supattra Lertwattanakiat, Senior Fruit Expert, Horticultural Research Institute, Thailand presented on the "Smart Farming Practices for Sustainable Coconut Development in Thailand". She explained the 20 year National Strategy for coconut and the BCG model followed – Bioeconomy, Circular Economy and Green economy. She also briefed about the coconut situation in Thailand, developmental activities and research undertaken etc. The talk on "Efficient Coconut Farming System for Increasing Coconut Production" was presented by Mr. Mohd Ibrahim Basri, Assistant Director, Department of Agriculture Malaysia. He presented an overview of the Malaysian Coconut Industry and its strategic plan and development. Smart Irrigation system with IOT was explained which is a combination of monitoring and control and the piloting in different places was presented. Dr. Hengky Novarianto, Senior Scientist, Indonesian Palm Crops Research Institute, Manado, Indonesia presented on "Increasing Coconut and Farm Productivity". He explained the different strategies to increase production and productivity and at the same time increase farm income too. He explained about the special types like Kopyor dwarf coconut, Pandan Wangi dwarf coconut and the different hybrid coconuts released. The paper on "Mitigating the Impacts of Climate Change on Coconut Plantations through the Use of Mucuna Cover Crop" was presented by Dr. Rohit Lal, Senior Research Officer, Ministry of Agriculture, Fiji.

He stressed on the need to undertake resilience measures to climate change and the use of Mucuna as cover crop in conserving moisture and maintaining soil health. This was followed by a presentation by Goma Engineering PVT LTD., Mumbai, India where they presented the machinery and equipment available with them for coconut processing.

***Session 7 : Innovative Strategies for Preventing Economic Losses Caused by Pests and Diseases***

Pest and disease management is very crucial in ensuring production and productivity. Mechanisms of management should be technology driven to increase efficiency. The first paper, "Innovative Science & Technology to Deliver Solutions to the ICC's Greatest Challenge – Where Are We at Now? " was delivered by Dr. Wee Tek Tay, Senior Research Scientist, Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia. He explained the need for biosecurity preparedness to reduce spread of pests. This was followed by a paper by Dr. Wayne A. Myrie, Plant Pathologist, Coconut Industry Board, Jamaica on "Homogeneity of the 16S rRNA Genes in the Coconut Lethal Yellowing Phytoplasma in Jamaica". He presented on coconut sector in Jamaica and the impact of the disease, Lethal Yellowing which is a Phytoplasma disease. He explained the DNA sequencing done and the details of the 16S rRNA studied. Dr. Meldy L. A. Hosang, Head, Crop Protection Division, IPCRI, Manado, Indonesia presented on the "Technologies for Management of Rhynchoporus ferruginous in Indonesia". He presented details on its occurrence, ecology, damage and control mechanisms adopted. This was followed by a presentation on "The Strategies of Controlling Weligama Coconut Leaf Wilt Disease and its Current Status in Sri Lanka" by Dr. Rohana Wijesekera, Former Head, Crop Protection Division, CRI, Sri Lanka. He presented the history of incidence, demarcation of area undertaken, management strategies adopted and the current status of the disease.

The celebration of World Coconut Day was also done along with COCOTECH on the last day and the prize winners of the various competitions were announced. The Conference ended with the preparation and adoption of Recommendations from 49th International COCOTECH Conference. It was a good virtual gathering of people who love coconut. ■

# Vanijya Utsav

Coconut Development Board, Regional office, Guwahati participated in the Vanijya Utsav (Azadi ka Amrit Mahotsav) organized by the Tea Board, in association with Directorate General of Foreign Trade and Govt of Assam held from 21st to 22nd September 2021 at Sri Sri Madhabdeva International Auditorium, Panjabari,Guwahati. Coconut Development Board displayed various varieties of coconut convenience foods, value added products from coconut kernel, coconut shell & coconut water, coconut shell/wood based handicrafts and various leaflets, books & publications on coconut and postures on the nutritional and health benefit on coconut and its products in the Stall. Two coconut based entrepreneurs displayed their products and services in the Board's stall. Spices Board, Tea Board, Coffee Board, Rubber Board, DC Handicraft Govt of India, Indian Chamber of Commerce, SBI etc also participated in the exhibition and displayed their products in their stall. The theme of Vanijya Utsav was "Showcasing India as a Rising Economic Force and exploring the Export Potential of Assam". Shri Chandra Mohan Patwary, Hon'ble Minister of Industries, Commerce & Enterprise Govt. of Assam, the Chief Guest inaugurated the programme and Shri Kamakhaya Prasad Tasa, Hon'ble Member of Rajya Sabha was present as guest of honour. The Minister and MP visited CDB's stall

# Kera Suraksha Insurance Scheme

**Renu P Viswam,**
Statistical Investigator, CDB , Kochi -11

Agriculture is one of the most common occupation around the world. Its impact on the economic and social life is considerable. Coconut is a very common crop in the west coast and is part and parcel of the homestead farming mainly in Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. It has a significant role in the agrarian economy. In India, it is cultivated in 16 states and four Union territories and covers around 2.10 million hectares. Though, we have a number of agriculture insurance schemes extending risk coverage for the crops, animals and high market value products, we are yet to have a commercial propaganda for insurance that cover those involved in the agriculture sector especially those who are engaged in high risk skilled labour as part of their agrarian job.

The major challenge in coconut cultivation is the harvesting of coconuts especially from the Tall varieties which is more common along the West Coast & East Coast. This is done by the coconut tree climbers. Usually all over the country, farmers practice conventional harvesting method in which coconuts are picked by specially trained, skilful and experienced climbers. Due to the height of the palm and lack of branches, it is very difficult to climb the coconut trees. A professional climber with proper training only could climb coconut trees. In some places, coconut harvesting is done through plucking the coconuts using long sticks with hook. However, one still has to climb the palm to clean the crown, and undertake prophylactic management practices to have a healthy nut bearing palm. There is dearth of professional climbers to carry out coconut harvesting because it involves considerable risk posed by the tree height and uneven trunk surface. Numerous coconut-tree-climbing devices have been developed to overcome this issue, but human effort is still required.

The skill of the palm climbers need to be appreciated along with the risk they take in climbing the tall trees for ensuring a clean and pest free crown of the palm along with harvesting. In order to motivate youth into taking up coconut climbing, Board had initiated a programme called Friends of Coconut Tree wherein they would be trained for coconut harvesting as well as plant protection activities. While designing the programme, Board took considerable efforts to understand the difficulties and the risk involved in the occupation and incorporated an insurance known as “KERA SURAKSHA INSURANCE SCHEME” . The scheme was initially launched in association with M/s United India Insurance Company Limited during the year 2011 to cover up the risk to a certain extent and to ensure safety and security of coconut tree climbers. However, Board’s efforts for promoting the insurance scheme were not as fruitful as expected and takers were comparatively low mainly because most of them were not aware about the benefits of the

scheme and consequently failed to renew their insurance after the first year which was provided to them as complementary social security.

Hence, Board started concerted efforts and had a special drive for educating and creating awareness among the coconut tree climbers about the need for insurance coverage and this article is a step towards the same. It is well known that, there is no simple technique to do harvesting and crown cleaning of coconut tree; we also know how important regular harvesting is for coconut farming. Considering all the above facts, Board modified the insurance scheme to be more attractive and beneficial to coconut tree climbers/ harvesters. This was done in association with M/s Oriental Insurance Company Limited, Tripunithura.

The sum assured under the policy is Rs 5.00 lakhs. Partial disability leading to loss of earning capacity is covered up to Rs.2.5 lakhs. In case of admission to hospitals due to accidents, one is covered for medical assistance upto Rs 1.00 lakh. Board has also taken into consideration , the temporary incapacity to do work during the period of rest and has accommodated a benefit for a maximum period of 6 weeks upto an amount of Rs 18,000/- . Even the bystander/companion/aid of the patients can avail around Rs. 200/day for a maximum of 15 days. The highlight of this insurance is that this is a 24 hour accident policy that not only covers the occupational accidents, but even those like bike accidents, road accidents, snake bites etc. Further, as a coconut tree climber all one needs to pay is Rs 99/- (Annual premium) to get coverage under this scheme as the remaining is borne by Coconut Development Board

## The steps to join the scheme are detailed below:

1. Application form to be downloaded from the website of Coconut Development Board www.coconutboard.gov.in (Downloads - Application forms : Kera Suraksha insurance ).

2. As there is age criteria for joining the scheme (Coconut tree climber/harvester aged between 18-65 year (upper & lower limit included)), copy of proof of date of birth to be attached.

3. Those with FoCT (Friends of coconut tree) certificates / NT (Neera Technician) certificates/ Coconut tree Climbing Certificates through State/ other Govt agencies are required to attach copy of the certificate and those without certificates have to certify/attest the application form by their local

governing officer/panchayath president/ councillor/ CPS/CPF-President/CPC Chairman/ Agriculture Officer.

4. Payment of Annual premium of Rs 99/- (may be made through online mode or as Demand Draft in favour of Coconut Development Board)

All the above documents along with copy of payment done through online mode/ Demand Draft to be sent to Coconut Development Board.

Once the received documents and applications are verified, policy shall be issued to the climber within a week.

## Claim Procedures under the Policy

Claim process under the policy is simple and hassle free. In the event of any accidents during the period under coverage, the insured person needs to inform Coconut Development Board within 3 days (72 Hours) of the occurrence of the accident.

Claim form may be submitted once the treatment is completed/over.

Claim forms are available in the website, which may be downloaded and submitted. A part of the form needs to be filled by the Consulting Doctor and the other part by the Claimant. Details shall be filled in with utmost care and precision. Original documents like discharge summary, prescription, bills etc as sealed/certified by the doctor may be submitted along with the form. Fitness certificate is mandatory. Ayurvedic treatment in private hospitals is not covered under the policy. Ayurvedic treatment is claimable only in case of Govt Ayurvedic Hospitals.

To enrol under the scheme and for further details, you can contact us at 0484-2377266.

# Coco chemicals - potential value added products from Coconut Oil

**Jnanadevan. R**
Dy. Director (Retd.), CDB

Coconut oil (CNO) is an important cooking medium in the southern part of India. But its relative importance as an edible oil has been declining due to availability of cheaper substitutes like palm oil and other soft oils. World production of coconut oil (CNO) in 2018-19 was 2.88 million tons which is only 1.4% of the total edible oil (199.82 million tons) produced by nine major edible oils in the world. According to the United States Department of Agriculture (USDA) estimates 2017-18, industrial usage of CNO accounts for about 49 percent of global production and remaining 51% only is consumed as edible oil. In India 40% CNO is consumed as edible oil and industrial use accounts for 60%, which is mainly in soap industry. If we compare the trend of production of CNO with other edible oils during the last ten years (2009-10 to 2018-19) we can see that growth rate was very weak, and that it has decreased from 3.26 million MT to 2.88 million MT registered 12% decrease. As against this, production of other vegetable oils show a tremendous increase during the same period. Palm oil production has increased from 45.27 million MT to 75.59 million MT registerering 67% increase, while the production of soya bean oil increased from 36.1million MT to 56.5 million MT, rape seed oil increased from 21.72 million MT to 25.31 million MT and sunflower oil increased from 13.04 million MT to 20.01 million MT. To sum up, while the world production of major vegetable oils increased to 46%, the corresponding growth of CNO during the 10 year period was negative. Even though CNO contribution is very low in the global market compared to other major edible oils it still maintained its demand in the domestic and international market both in the edible and non edible sector because of its uniqueness. CNO has captured an increased segment of non-food uses like oleo chemicals, personal care products and various other industrial uses in the international market. But it faces stiff competition from various vegetable oils, mainly Palm Oil (PO) and Palm Kernel Oil (PKO). CNO has niche market under natural lauric fatty acid and medium chain triglycerides

Oleo chemicals produced from CNO is called Coco chemicals. Fatty acids, one of the basic natural oleo chemical, present in CNO is used as starting material for wide variety of higher value added oleo chemical products. Many types of fatty acids are now being produced by fractionation of CNO. Most common and useful among them is lauric acid. Though world demand for coconut fatty acids is slowly increasing, Palm Kernel Oil

(PKO) is still the major source of lauric acid which is mostly manufactured in Malaysia. Both the oils also called lauric oils have high levels of lauric acid but the two oils differ from each other. Lauric acid, capric acid, caprilic acid, myristic acid and palmitic acid are the major industrially useful fatty acids derived from CNO. Fatty alcohol (lauryl alcohol and myristyl alcohol) and glycerol are other high value industrially useful coco chemicals which can be derived from CNO. These are key ingredients for common oleo chemical products such as pharmaceuticals, detergents, soaps, cosmetics etc. On the other hand, oleo chemical derivatives are produced from a multitude of reactions often using the basic oleo chemicals as building blocks. These oleo chemicals and their derivatives find their way into a long list of applications and market. Consumer trend is also increasing towards the application of oleo chemicals in the detergent, soap and personal care products. In India there are few industrial units for producing coco chemicals by fractionation of CNO. India has to consider a lot of other things in this area for improving its product development and industrial base and for making a significant contribution to the global market.

The lauric oils (CNO&PKO) are mainly used in the oleo chemical industry, due to their high lauric acid content. Lauric acid is a medium-chain saturated fatty acid, a basic coco-chemical, which makes up 45 to 50% of CNO. Lauric acid is converted in to monolaurin, a metabolite that is naturally produced by the body's own enzymes upon intake of CNO. It is also available in pure form in the oleo- chemical industry as a supplement. The lauric acid is used extensively for both food and non-food purposes and the range of its uses is extended by further hydrogenation, fractionation and by inter-esterification. In food industry lauric acid is mostly used in preparation of high quality spreads, shallow frying oils, filling creams for biscuits and cakes, ice cream, non-dairy whipping creams, coffee whiteners etc. Lauric acid and its derivatives are used in soaps, bath products with excellent lathering and conditioning quality, and also in household and industrial cleaning products as a surfactant, cleansing agent and emulsifier. Coconut fatty acids and its esters are used in the manufacture of intermediates for the textile industry, lubricants and metal working fluids. Other group of fatty acids extracted from coconut oil is caprylic acid and capric acid which are further processed to produce medium chain triglycerides. Sodium lauryl sulfate (SLS), a common surfactant that is made from lauric acid. CNO has largest percentage of glycerol (13.84%) which is an important by product which is used in various industries especially in pharmaceuticals and food industries. CNO with highest percentage of lauric acid is a potential source for producing monolaurin, and SLS are also used in a wide range of products for their antiviral properties. Hierholzer and Kabara (1982) reported that these fatty acids and its derivatives kill viruses (HIV, cytomegalo viruses, Herpes virus, and Influenza virus). It can cause disintegration of the virus envelope, inhibit late maturation stage in the virus replicative cycle and prevent the binding of viral proteins to the host cell membrane. Capric acid is another medium chain fatty acid which accounts for about 6-7% of coconut oil. Capric acid and monocaprin have also shown promising activity against other viruses, such as HIV-1 (Kristmundsdóttir et al., 1999). Considering its antiviral activity, pilot clinical trials have been initiated in Indonesia using Virgin Coconut Oil (VCO) as an adjuvant therapy for Covid-19 patients. It is expected that VCO can prevent disease from worsening (Ref. ICC website). However, more detailed clinical studies need to be conducted in this area.

## Extent of Value addition converting CNO to Coco chemicals

CNO is one of the most important raw materials for oleo chemical industry in the Philippines. There is huge demand for oleo chemical products in the domestic and international market. The market for coco chemicals have recorded substantial growth since 1980s particularly in industrialized nations as well as in some developing countries. The price of key oleo chemicals such as fatty acids and fatty alcohols is twice the price of inputs such as crude coconut oil and palm kernel oil. One unit of coconut oil gives out 0.93 units of various coco chemicals and resultant products sell at a much higher price. Estimates have shown that an addition of 800 to 1000 US dollars per ton of CNO can be earned with this value addition. This additional income by value addition is presently generated by the CNO importing countries by re exporting it as coco chemical products. About 70-85% of the production cost of basic oleo chemicals is feedstock or raw material cost. Changes in the supply and demand and prices of coconut oil have significant impact on the coco chemicals competitiveness. The main constraint now faced by the coco chemical industry is instability in supply of raw material (CNO) and its availability at competitively affordable price.

| Share of CNO in Global Vegetable Oil Production (2020/21) | | | | | |
|---|---|---|---|---|---|
| Sl. No | Product | Quantity (in Million MT2010/11) | Quantity (in Million MT 2020/21) | % share | Change over 10 years |
| 1 | Palm Oil | 49.18 | 72.91 | 35.2 | +48% |
| 2 | Soybean Oil | 41.47 | 59.73 | 29.0 | +44% |
| 3 | Rape Seed Oil | 23.42 | 29.11 | 14.0 | +25% |
| 4 | Sunflower Oil | 12.09 | 19.27 | 9.3 | +59% |
| 5 | Palm Kernel Oil | 5,67 | 8.77 | 4.2 | +54% |
| 6 | Cotton Seed Oil | 4.81 | 4.68 | 2.3 | +1% |
| 7 | Groundnut oil | 6.41 | 6.12 | 3.0 | -4% |
| 8 | Olive Oil | 2.92 | 3.20 | 1.4 | +9% |
| 9 | Coconut oil | 3.50 | 3.44 | 1.6 | -2% |
| | World Total | 199.82 | 207.23 | 100.00 | +26% |
| *(Source: Foreign Agricultural Service/USDA Global Market Analysis-2021)* | | | | | |

## Way forward

Global demand for coconut has been increased exponentially in the past few years, inlines with the increasing demand for coconut products such as coconut water, coconut milk powder, coconut sugar, desiccated coconut and virgin coconut oil. This leaves the oleo chemical industry fewer coconuts to be processed for their oil. The combination of increasing coconut product demand and decline in production due to aging of coconut tree population in major producing countries has resulted in increased prices over the past few years. According to United States Department of Agriculture, a stable lauric oil demand is anticipated from the oleo chemical industry. It is estimated that world demand of lauric fatty acid is 4.5 million MT annually of which one third is consumed in US alone. World import of CNO averages between 1.9 million MT and PKO 1.7 million MT for a total of 3.6 million MT. Assuming a recovery rate of lauric acid of 40%, available supply from both sources combined would be 1.4 million MT. The huge demand supply gap is being filled up by similar products derived from petro based products. During the last decade there has been considerable development in coconut sector based natural coco chemical industry in the world and increasing quantities of different fatty acids are finding wider use in various sector. In view of major threats being posed by other vegetable oils it would be appropriate to seriously consider dependence on CNO as edible oil. Major CNO producing countries are less dependent on it as edible oil and are using it more in industrial sectors. CNO has substantial use in oleo chemical industry apart from its use as edible oil. However, changes in the supply and demand and prices of coconut oil have significant impact to the coco chemicals competitiveness. The impact of the supply and cost of CNO to its viability as an oleo chemical feedstock is complicated by the fact that there are other natural and synthetic raw materials that can viably used for this purpose. The increasing price of crude oil and narrowing premium now being set to CNO relative to PKO has made CNO more competitive in oleo chemical industry. However price instability and availability of CNO are the major concerns for establishing large coco chemical plants in India. Therefore the coconut oil producing sector in India may adopt programs that will ensure continued production growth and price competitiveness of coconut oil against substitutes. Besides, CNO industry in India need to be modernized in making value added oleo chemical products. Possibility of importing crude CNO for production of value added coco chemical products also need to be ascertained. This value addition avenue needs to be considered to make a healthier and vigorous coconut industry in India in the coming years. ■

# Strengthening Farmer Producer Organisations in Coconut Sector


**Thamban C.,**
Principal Scientist, ICAR - CPCRI, Kasaragod

Worldwide, farmers are often exposed to economic risks and uncertainties owing to price crashes and a high degree of price fluctuation in farm produce. Same is the case with coconut growers in India. Coconut is cultivated predominantly in small and marginal holdings in India. Many of these farmers often find it difficult to effectively utilize technologies for realizing higher productivity and income from their tiny holdings. But when mobilised as Farmer Producer Organisations (FPOs) these small and marginal coconut farmers are able to address their resource limitations and this has been amply demonstrated by various agencies including the ICAR-Central Plantation Crops Research Institute (ICAR-CPCRI). The Coconut Development Board (CDB) has been promoting the formation of FPOs in the coconut sector so as to improve productivity and promote value addition through product diversification and marketing for enhancing the profitability of coconut farming.

The coconut inflorescence sap, namely neera, is a value-added product with huge potential to be promoted as a health drink. Technologies for extracting neera from coconut palms were developed by various research institutions, including ICAR-CPCRI (Hebbar et al. 2015). Even though neera is a 'zero alcohol' drink, its production and marketing were restricted due to the provisions of the Abkari

| Table : 1 | | | | |
|---|---|---|---|---|
| No. | States | No. of CPS | No. of CPF | No. of CPC |
| 1 | Kerala | 697 | 73 | 17 |
| 2 | Tamil Nadu | 7230 | 467 | 29 |
| 3 | Karnataka | 400 | 125 | 13 |
| 4 | Andhra Pradesh | 1157 | 82 | 8 |
| 5 | West Bengal | 1 | 0 | 0 |
| 6 | Odisha | 39 | 0 | 0 |
| 7 | Assam | 14 | 0 | 0 |
| 8 | Gujarat | 218 | 0 | 0 |
| 9 | Maharashtra | 29 | 0 | 0 |
| | TOTAL | 9785 | 747 | 67 |

Act governing the production and marketing of alcoholic beverages prevailing in the major coconut producing states. However, due to the concerted efforts of CDB and coconut growers' associations, the Government of Kerala amended the Abkari Act and created a congenial policy environment for the production and marketing of neera. Encouraged by the favourable policy environment and incentives, many coconut FPOs established neera production units in their respective jurisdictions and started its marketing. However, a substantial number of neera units managed by these FPOs have been discontinued due to various problems.

## Promotion of FPOs by the Coconut Development Board

Organizing the unorganized coconut sector through farmers' collectives was one of the important activities of CDB during the Twelfth Five-Year Plan (2012-2017). Since then, CDB has been facilitating the formation and handholding of FPOs in the coconut sector. The three-tiered FPO structure facilitated by the Board has coconut farmers organized into small neighbourhood informal groups at grassroot level as Coconut Producer Societies (CPSs), which are small scale FPOs formed by an association of 40-100 coconut growers in a contiguous area with a consolidated minimum of 4000-5000 palms.

The farmer member contributes equity in the organization and undertakes activities aimed at productivity improvement, cost reduction, collective marketing, processing and product diversification. The CPS forms the basic unit of the FPO framework in the sector. The next hierarchical tier, the CPF, is formed by combining about 8-10 CPSs. The FPOs formed are provided legal status through registration under the Charitable Societies Act and are also registered with CDB. An aggregation of 8-10 CPFs would form a Coconut Producer Company (CPC) under the Indian Companies Act, 1956. A CPC will have around 10 lakh coconut palms under its management. So far, 9785 CPSs, 747 CPFs and 67 CPCs have been registered in the country. The progress of CPS, CPF, and CPC formation so far is summarised in Table 1.

Development of technologies for production of neera from coconut palms, awareness about its potential as a health drink and economic benefits led to widespread discussion at the policy level on creating an enabling environment to support coconut growers in order to utilize the potential of neera, who were otherwise struggling due to low market price of coconut (Box 1).

A 2016 study indicated that a total of 204 CPFs were granted licenses to produce and market neera (Table 2). Most (91%) of these licenses were issued during the period from 2014 to 2016. Only 95 (43%) CPFs initiated the production activities. The remaining CPFs could not start neera production mainly due to the lack of skilled palm climbers and lack of neera processing plant under the CPCs in their jurisdiction. It is noteworthy that only 13 Federations (14%) out of the 95 CPFs who have ventured into production have continued with their activities, and in eight out of 14 districts neera production by all the CPFs was discontinued. After this data was collected in 2016, many more units discontinued neera production.

The scarcity of skilled manpower for neera tapping coupled with very high wage rate was observed to be the major factors that contributed towards the discontinuance of neera tapping (Table 3). The supply

**Box 1: Policy changes to support promotion of Neera**

Due to the efforts of CDB and various farmer organizations, the Government of Kerala amended the Abkari Act to enable coconut growers to take up enterprises for production and marketing of neera for enhancing income from coconut farming. Meanwhile, efforts of the State Government to save the traditional toddy sector which was going through a crisis also indirectly contributed to the evolution of a congenial policy environment to support coconut growers for neera production and marketing.

The government accepted the recommendations of the expert committee constituted to study and report strategies to revive the traditional toddy sector, and for the first time granted permission to CPSs/CPFs facilitated by CDB and five other agencies for production and marketing of neera. Subsequently amendments were made to the existing Abkari Act of 1931 and rules (Kerala Sweet Toddy [Neera] Rules 2014) were framed for issuing licenses for the production and marketing of neera.

The Toddy-Neera Board was also established for implementing suitable interventions to make coconut farming more remunerative and to promote marketing of neera as a health drink within the state and other parts of the country. The Government of Kerala also took many steps – providing subsidy for training of neera technicians, support for CPCs for the installation of plant and machinery for neera production, and providing equity support to the coconut FPO – to promote neera production as an important measure to solve the problems of the coconut sector.


Table 2. Field level scenario of sustainability of interventions taken up by CPFs pertaining to production and marketing of neera in Kerala State

| No. | District | CPFs with licence for neera production | CPFs started neera production |
|---|---|---|---|
| 1 | Thiruvananthapuram | 10 | 6 |
| 2 | Kollam | 3 | 3 |
| 3 | Alappuzha | 17 | 9 |
| 4 | Pathanamthitta | 1 | 1 |
| 5 | Kottayam | 6 | 3 |
| 6 | Idukki | 2 | 1 |
| 7 | Ernakulam | 11 | 8 |
| 8 | Thrissur | 6 | 3 |
| 9 | Palakkad | 11 | 10 |
| 10 | Malappuram | 56 | 9 |
| 11 | Kozhikode | 58 | 35 |
| 12 | Wayanad | 1 | 1 |
| 13 | Kannur | 13 | 4 |
| 14 | Kasaragod | 9 | 2 |
| | Total | 204 | 95 |

*Source: Thamban et al. 2020.*

chain of neera was not robust enough to sustain the activities with optimal distribution of revenue share. Low level of technical knowledge and marketing expertise of the entrepreneurs who ventured into the neera sector also led to discontinuance of the activities.

## Hurdles encountered

The study revealed that a substantial number of producer organisations could not sustain their activities due to various constraints related to technology, marketing and policy. These are discussed in detail below. It is imperative that there is need for a restructured support mechanism to sustain the FPOs so as to effectively carry out activities related to neera-based enterprises.

### *1. Need of a support mechanism to enable FPOs to sustain interventions*

Formation of CPFs and initiation of various activities for the production and marketing of neera were mainly triggered by CDB and the initial phase of these FPOs were quite encouraging. The FPOs were unable to cope with the production and market-related hurdles that emerged thereafter, which ushered most of them to the exit routes. The results of the present study is in line with the earlier observations that in the case of farmer producer organizations

| Table 3. Factors contributing to the discontinuance of neera production activities: CPFs' perception (n=82) | |
|---|---|
| **Factors contributing to the discontinuance** | **No. of CPFs citing the factor** |
| Scarcity and high wage rate of palm climbers/neera technicians | 48 (59) |
| Inadequate support from state government agencies/LSGs | 21 (26) |
| Marketing problems | 45 (55) |
| Low yield of neera due to poor management of coconut palms | 22 (27) |
| CPC not formed in the area of CPF functioning to manage marketing of neera | 3 (4) |
| Low economic viability | 28 (34) |
| Inadequate processing facilities | 3 (4) |
| Drudgery involved in climbing palms for tapping due to predominance of very tall coconut palms | 12 (15) |
| Problems in tapping palms during rainy season | 23 (28) |
| Lack of product uniformity due to non-standardised technologies for neera production | 9 (11) |
| Spoilage due to low shelf life of neera | 9 (11) |
| Note: Figures in parentheses are percentages. | |
| *Source: Thamban et al. 2020.* | |

formed with the external trigger of a programme of the government, NGO, or other agency a common challenge for institutional sustainability is how to survive once the policy or programme has ended (GFRAS 2015).

***2. Need for strategies for marketing neera***

Problems related to marketing were a major hurdle in sustaining neera enterprises by CPFs which included lack of product uniformity and lack of proper adoption of the recommended neera production protocol which affected the product quality. Consumer perception studies which are essential for streamlining strategies for successful marketing have to be undertaken. Neera enterprises under coconut FPOs were finding it difficult to handle competition with other products, including soft drinks, for its market share and neera as a unique product with a nutritional edge has to be appropriately positioned while marketing.

***3. Policy constraints to be addressed***

Though the Government of Kerala has come out with a pro-farmer policy framework for the production and promotion of neera in the state, it is highly paradoxical that, even now the product is partially under the control of the Excise Department, which is entrusted with granting licences for neera production. The producer organisations perceive it as a cumbersome process to obtain a licence for tapping coconut palms for neera and renewal of the licence every year. They also think that since neera is being promoted as a non-alcoholic health drink, it should be delinked from the Excise Department – thus making the formalities for issuing a license simpler.

***4. Need for a target specific entrepreneurial development programme***

Planning and implementation of interventions pertaining to production and marketing of neera is to be undertaken. The asymmetry of information on the level of inherent managerial and technical expertise of the FPOs was evidently the major reason for early discontinuance of the neera business by the aspirants. A well-designed, target specific entrepreneurial development programme on various facets of the neera value chain would help the business aspirants to survive the inertia of business inherent in the initial phase.

***5. Labour-related constraints***

Scarcity of palm climbers/neera technicians coupled with high wage rates was observed to be an important factor that had adversely affected the sustenance of neera enterprises in the state. Predominance of tall coconut palms in the coconut groves in the state was another limiting factor that added to the workload of climbers engaged in neera tapping. Commitment from skilled climbers is a key factor in the successful management of a neera enterprise and in many neera units lack of punctuality of climbers and conflicts over the wage rate created difficulties in ensuring regular supply of neera. The Board had extended training for neera technicians, but the manpower trained was inadequate.


*Mr Shaju, farmer cum neera technician from Udayagiri, Kannur District, Kerala*

***6. Need for technology assessment and refinement***

Lack of product uniformity due to different technologies for neera collection across the state was another important reason perceived by CPFs for the discontinuance of neera enterprises. Spoilage due to low shelf life of neera was also cited as another reason for discontinuance. The study revealed that majority of the CPFs (73%) adopted technology developed by CDB through SIBB R&D (SCMS Institute for Bio-Science and Biotechnology Research and Development), for neera collection and processing and the remaining 27% of CPFs resorted to technology developed by ICAR-CPCRI. Back-up support for effective field level utilisation of neera technologies is very much essential for successful implementation.

***7. Economic viability of the neera enterprise***

Even though a very attractive level of economic benefits was projected for neera enterprises, due to field level constraints it could not be achieved in reality. The neera collection was limited to a very limited number of coconut palms by most of the CPFs and the existing policy on neera production has prevented the CPFs from realising the economies of scale. Yield level of neera per palm per tapping day was not that attractive mostly due to poor palm health, thereby adversely affecting economic viability. Hence, scientific management of coconut palms plays a crucial role in ensuring better yield and continuous supply of neera in the upstream end (production node) of the neera value chain.

## Conclusion

Promoting FPOs for processing and value addition is to be undertaken with adequate technology refinement and market assessment. FPOs do need continuous handholding support to help them deal with the technical and marketing challenges in enterprise development. Collaborative support from various develpmental institutions would help in providing continuous hand holdig. There should also be mechanisms to respond to policy and institutional bottlenecks that can constrain the scaling up of new farmer enterprise. In other words, Farmer Producer Organisations (FPOs) need support not only at the FPO level, but also at the promotion and ecosystem level (Aneesha 2021). A slow and steady paced journey is ideal for FPO's, which will help them in attaining sustainable development and stabilizing their position in entrepreneurial development to have the farming community forever.

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***Source: https://www.aesanetwork.org/blog-156***

# ICAR-CPCRI celebrated World Coconut Day

Every year World Coconut Day is celebrated worldwide on September 2nd by the member countries of International Coconut Community (ICC) and India is a founder member of ICC. The focal theme of World Coconut Day 2021 as proposed by ICC was 'Building a safe inclusive resilient and sustainable coconut community amid Covid-19 pandemic and beyond'. In line with the focal theme, ICAR-CPCRI celebrated this year's coconut day by organising various programmes in different locations of the country online and off line modes involving various stakeholders.

Shri. P. Prasad, Hon'ble Minister of Agriculture & Farmers' Welfare, Government of Kerala, inaugurated the online 'World Coconut Day' celebration of ICAR-CPCRI . In his address Shri. Prasad highlighted the need to give thrust for production and marketing of value added coconut products to enhance income from coconut farming. Government of Kerala has taken the decision to support Farmer Producer Organisations to take up coconut processing and marketing enterprises. Establishing agro-processing parks, initiative under the Coconut Development Council for distribution of quality seedlings of improved coconut varieties and various activities under 'Keragramam' scheme are all oriented towards strengthening coconut sector in the state. There is urgent need to effectively integrate technologies in the coconut holdings for increasing coconut productivity and profitability so as to bring back the coconut prosperity, he added.


Hon'ble Minister, Shri. Prasad also felicitated Shri. Abhilash K.S., a young entrepreneur who received technology and handholding support from the Agri-Business Incubation Centre, ICAR-CPCRI, Kasaragod. Dr. Anitha Karun, Director ICAR-CPCRI welcomed the dignitaries, farmers, entrepreneurs and other stakeholders and Dr Venkatasubramaniam, Director, ICAR-ATARI Bengaluru offered felicitations.

In line with the focal theme, the ICAR-CPCRI conducted programmes to support the marginalised communities as part of coconut day 2021 celebration. Shri. K. Radhakrishnan, Hon'ble Minister for Welfare of Scheduled Castes, Scheduled Tribes and Backward Classes and Devaswom, Government of Kerala, handed over the coconut seedlings in a virtual programme to the scheduled tribe farmers rehabilitated at Aralam Farm in Kannur district.

Shri. Radhakrishnan in his address emphasised the need to implement interventions to develop a favourable attitude among people towards farming. It is all the more important and relevant during the present scenario because it is reported that agricultural production is going to be adversely affected by the COVID-19 pandemic and marginalised people with low purchasing power will be the most affected. In Kerala, the land of coconut, coconut farming is

facing lot of challenges and efforts are required to bring back the coconut glory. Value addition through product diversification is an important strategy for enhancing income and employment opportunities, he added. Shri. K. Radhakrishnan also handed over vegetable seeds to selected scheduled caste women farmers from Thonnakkal village, Pothencode block, Thiruvananthapuram in a function held at his office in Thiruvananthapuram under the SCSP/STC schemes.

The Hon'ble Minister also inaugurated the coconut seedling distribution in online mode. Adv. Sunny Joseph, M.L.A. Peravoor, Smt. P.P. Divya, President, Kannur District panchayat, Shri Binoy Kurien, Vice President, Kannur District panchayat, Shri K. Velayudhan, President Iritty Block Panchayat, Shri K.P. Rajesh, President, Aralam Grama Panchayat and Smt. Mini Dineshan, Member, Aralam Grama Panchayat distributed coconut seedlings and offered felicitations. Dr. Thamban C, Principal Scientist welcomed the gathering and Shri Bimal Ghosh, Managing Director, Aralam Farming Corporation proposed vote of thanks.

As part of coconut day celebration, 5500 coconut seedlings were distributed to selected SC/ST farmers on 2nd September 2021 in a function held at Bhubaneswar. The programme was conducted under SCSP/STC scheme in collaboration with Kalpabrukhya Foundation. Dr. Satya Tapas, Smt. Deepa Prajwalana and Dr. Gobinda Chandra Acharya addressed the gathering.

A Stakeholders' Meet on Coconut Based Microenterprises was conducted as part of World Coconut Day celebration at Kavaratty in collaboration with Lakshadweep Krishi Vigyan Kendra on 2nd September 2021. Mr. Abdul Khader, Chairperson, Lakshadweep Village (Dweep) Panchayat inaugurated the meet. Dr. Anand Sr. Scientist& Head, KVK welcomed the gathering. Dr. Shameena Beegum, Scientist, ICAR-CPCRI, Kasaragod handled a session on Micro enterprises of coconut value added products.

A Capacity Development Programme for SC/ST farmers on 'Enhancing Income and Employment Opportunities through Coconut Based Farming Systems and Enterprises' was conducted at Aralam on 2nd September 2021 as part of coconut day celebrations. The programme was inaugurated by Smt. P.P. Divya, President, Kannur District panchayat. Shri Binoy Kurien, Vice President, Kannur District panchayat, and Smt. Mini Dineshan, Member, Aralam Grama Panchayat offered felicitations. Dr. Thamban, C., Principal Scientist welcomed the gathering and presented the outline of the training programme.

## Newly appointed Members of Coconut Development Board

Shri Suresh Gopi, M.P (Rajya Sabha), Lekshmi, D-9, Temple Road, Sasthamangalam, Trivandrum - 695 010 , Phone: 011- 23722177

Shri S.V. Muthuramalingam, Sirukalanthai Post, Kinathukadavu, Coimbatore- 642 202, Phone: 9443028441

Shri Renukumar B.H S/o Shri Halgegowda B.S, Bennur Village & Post, Kasaba Hobli, Belur Taluk, Hassan, Karnataka-573 115, Phone: 9945160661

Shri R. Elango No.157, Perumal Koil Street, Pattukkotai Tamilnadu-614 601, Phone: 9488117474

Shri P. Reghunath, Achyutham, Malaparamba Post Office, Kozhikode-673 009, Phone: 9447778755

Shri H.L. Aswathnarayana, Annapura Halepalya Post, Tiptur Karnataka-572 202 Phone: 6363067478

Shri K. Narayanan Master Koyattil House Ozhur P.O, Tanalur Via Malappuram-676 307 Phone: 9447004994

Shri Guruswamy D. S/o Shri Dayamappa, Mavinakatte, Beesanahalli Post, Hosadurga Taluk Chitradurga, Karnataka- 577 527, Phone - 9980817794

Shri. Bimal Ghosh, Managing Director, Aralam Farming Corporation proposed vote of thanks in the inaugural function.

Two batches of 20 SC/ST farmers each were trained under the programme. The programme was conducted as a collaborative initiative involving ICAR-CPCRI Kasaragod, Aralam Farming Corporation and Coconut Development Board.

The capacity development programmes for SC/ST farmers was conducted to enhance their knowledge and skill on various aspects of Coconut Based Farming Systems and Enterprises to enhance income and employment opportunities.

Thematic areas pertaining to knowledge and skill development in planting material production in coconut, scientific crop management and coconut based cropping/farming systems, coconut value added product based enterprises for enhancing income and employment opportunities and FPOs to pursue group approaches for higher income from coconut farming were covered under the training. Dr. A.C. Mathew, Dr. P. Subramanian, Dr. Thamban C. and Dr K. Samsudeen, Principal Scientists, ICAR-CPCRI Kasaragod handled different sessions in the training programme.

A training programme for farmers on scientific coconut cultivation was organised at ICAR CPCRI RC, Kahikuchi, Assam as part of the World Coconut Day celebration on 2nd September, 2021. Shri. Pankaj Das, best coconut farmer award winner for North-Eastern region shared his experiences in coconut farming with other farmer participants.

*Prepared by: C. Thamban, Principal Scientist & S. Jayasekhar, Sr. Scientist, ICAR-Central Plantation Crops Research institute, Kasaragod* ■

# ICAR – AICRP on Palms celebrated World Coconut Day across the country

The All India Coordinated Research Project on Palms of Indian Council of Agricultural Research (ICAR) under National Agricultural Research System (NARS) is an unique mechanism for testing location-specific and need-based innovations in different agro-climatic conditions in the country. At present the Project has coconut, oil palm, arecanut, palmyrah and cocoa as mandate crops and it is implemented in 28 centres of which 15 centres are conducting research on coconut, six on oil palm, four on arecanut, four on palmyrah and seven on cocoa. All coconut centres of AICRP on Palms across the country observe World Coconut Day every year, to create increased awareness on the coconut which will help focus national and international attention on this crop.

## Aliyarnagar

Coconut Research Station, Aliyarnagar organised a State level webinar on "Advanced techniques in coconut production technology". Around 270 coconut growers from all over Tamil Nadu participated in this webinar. During the inaugural ceremony Dr.S.Praneetha, Professor and Head, CRS, Aliyarnagar, welcomed the gathering. Dr.N.Kumar, Vice- Chancellor, TNAU, Coimbatore, presided over the function and delivered Presidential address. The Dean, Horticultural College & Research Institute and the Director (Open and Distance Learning), TNAU, delivered special address. Thiru. Krishnasamy Gounder (Board Member) Thiru. Sethupathy and Thiru OVR. Somasundram( Ex Board Member), TNAU spoke during the ocassion. In the technical sessios which followed Dr. S.Praneetha, Professor and Head spoke on Coconut cultivation technology, V. Sivakumar, Asst. Prof. (Hort.), spoke on Coconut varieties, Dr. C. Sudhalakshmi Asst. Prof. (Agronomy) spoke on Integrated Nutrient Management, Dr. M.Alagar, Assistant Professor (Agrl. Entomology) spoke on Pest Management in coconut and Dr.E.Rajeswari, Assoc.Professor (Plant Pathology ) spoke on Integrated Disease Management in coconut.

## Ambajipeta

The world coconut day was celebrated at Horticultural Research Station, Ambajipeta. 30 progressive farmers from the nearby villages, VHA's, VAA's, HO's and FPO members participated in the programme. An awareness programme was conducted for the farmers, VHA's, VAA's & HO's of Kothapeta Mandal on black scorching disease of coconut. Dr. V. Govardhan Rao, Scientist (Pl. Path.) spoke on symptoms for identification of disease, precautions to be followed for controlling of spread and management practices to be adopted for controlling of disease. Dr. B.V.K. Bhagavan, Principal Scientist (Hort) & Head, spoke on the status of work carried out on this disease investigation and clarified the doubts raised by farmers on the progress of disease identification.

## Goa

World Coconut Day was celebrated at ICAR-CCARI Old Goa by All India Coordinated Research Project (AICRP) on Palms –Goa centre and Schedule Tribe Component (STC) of ICAR-CCARI.A demo of use of coconut climbing device was organised at the AICRP (Palms) unit of B block of experimental field of the campus. All the participants practised using the device and clarified their doubts on the usage and maintenance. Dr Parveen Kumar, Director ICAR-CCARI chaired the meeting and briefed the participants about the World Coconut Day and the importance of coconut in sustainable livelihood of coconut growers and health of consumers. He also stressed the need

for improving productivity of coconut, enhance the value addition of coconut based products and improve the diversification of coconut gardens by intercropping practices. Dr V Arunachalam, Principal Scientist (Horticulture) and Scientist in charge AICRP (Palms) Goa centre, coordinated the event and distributed palm climbing devices.

## Kahikuchi

On the occasion of World Coconut Day on 2nd September, 2021, a day long programme was organized in the Farmers' Field at Bardodhi, Hajo in Kamrup district by AICRP on Palms, HRS, Kahikuchi Guwahati. Addressing the gathering during the inaugural session of the programme, Dr. J.C. Nath, Principal Investigator of All India Coordinated Research Project on Palms, HRS, Kahikuchi spoke on the significance and importance of observing the 'World Coconut Day', industrial uses of coconut, post harvest management and product diversification of coconut in order to make its cultivation more remunerative for the farming community. In the training programme, Dr. GKS Baruah, Principal Scientist, HRS, Kahikuchi elaborated the procedure of selection of mother palms to get quality seed nut, method of planting of coconut seedling and fertilizer application in coconut and also briefed about other improved production technologies of coconut. Ms Sibani Bora, Jr. Scientist, spoke on the various diseases and pest management in coconut. 60 farmers along with the other stakeholders attended the meeting which was presided by Ms Rita Talukdar, President Kamrup Jila Parishad .

## Navsari


All India Coordinated Research Project (Palms) Regional Horticultural Research Station, ASPEE College of Horticulture & Forestry and Krishi Vigyan Kendra, Navsari Agricultural University, Navsari jointly celebrated World Coconut Day by organizing training on 'Value addition and making of articles from coconut fibre' on September 2, 2021 in the presence of Dr. Z. P. Patel, Hon'ble Vice Chancellor, Navsari Agricultural University, Navsari; Dr. S. R. Chudhary, Director of Research, NAU, Navsari; Dr. C. K. Timbadia, Director of Extension Education, NAU, Navsari; Dr. P. K. Shrivastava, Principal and Dean, ASPEE College of Horticulture & Forestry, NAU, Navsari. Dr. P. K. Shrivastava, Principal and Dean. Hon'ble Vice-Chancellor, in his presidential speech, focused on coconut based women-led enterprises with the goal of improving their lives by making and selling value-added products from coconuts. He spoke on different coconut products such as charcoal from coconut shell, vinegar from coconut water, coco peat, organic fertilizer and coco-coir from husks, vegetables and processed snack food and drinks. The guest of honour Dr. S. R. Chaudhary applauded the farm women for making different types of handicraft product from coconut husk and best out of waste from coconut shell. The chief guest Dr. C. K. Timbadia highlighted and spoke on awareness about the importance and benefits of coconut. He said that raw materials such as fibre and wood and promoting its commercial production can also help

in poverty alleviation and provide nutrient rich cheap food sources in areas need uplifting. In the technical session, Dr. Jilen Mayani, Assistance Professor, PHT, NAU, Navsari spoke information regarding values addition and its benefits whereas, Prof. Artiben Soni, Scientist, KVK, Vyara spoke on different products that can be made from coconut fibre. More than 60 farm women farmers participated in the event. Dr. P. P. Bhalerao, Project In-charge, AICRP (Palms) proposed vote of thanks.

## Ratnagiri


The 23rd World Coconut day was celebrated at Regional Coconut Research Station, Bhatye, Ratnagiri (MS.) on 2nd September 2021. The special theme of this programme was "Coconut cultivation-Building a safe, inclusive resilient and sustainable coconut community amid covid 19 pandemic and beyond". Hon'ble District Collector, Ratngiri Dr. B.N. Patil, inaugurated the programme. Shri. Rajabhau Limaye, Ex. Member, Coconut Development Board, Kochi and Shri. Sanjay Shinde, Additional Collector, Ratnagiri were the chief guests of the function. Dr. Sanjay Sawant, Hon'ble Vice-chancellor, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli and Dr. P.M. Haladnkar, Director of Research joined through online. Dr.Vaibhav Shinde. Dr. S.L. Ghavale, Research Officer, and Dr. S.M. Wankhede, Jr. Entomologist spoke during the ocassion. The station arranged various demonstrations on small scale homemade technology development activities like weaving of coconut leaves, broom making, preparation of vermicompost, preparation of virgin coconut oil, coconut chips etc.

## Port Blair

On the occasion of World Coconut Day-2021, an awareness programme on 'Plantation crops based cropping system for higher profits' was conducted


on September 2nd at ICAR-CIARI under the All India Coordinated Research Project on Palms Project. Dr. Ajit Arun Waman, Principal Investigator of the project, spoke on importance of celebration of this event. He emphasized that plantation crops have a pivotal role to play in the island agriculture and profitability of farming could be improved successfully by adoption of intercropping using profitable crops. Dr. Pooja Bohra, Scientist, ICAR-CIARI, in her address detailed about various major and minor fruit crops which could be incorporated in the plantation based cropping systems.

## Pilicode

Regional research Station, Pilicode inaugurated a farmer participatory programme on hybrid seed nut production on world coconut day. The supply of this year's hybrid seedlings produced under 'Kera Keralam Samrudha Keralam' programme was also conducted during the ocassion. ■

*Report prepared by H.P. Maheswarappa and Sumitha. S, ICAR- AICRP on Palms, ICAR- CPCRI, Kasaragod, Kerala, India*

# Virtual Farmer Field School on Integrated Crop Management in Coconut conducted on World Coconut Day

KVK Kannur in collaboration with CPCRI Kasargode organised a Virtual Farmer Field School (VFFS) on Integrated Crop Management in Coconut on World Coconut Day, 2nd September 2021. Dr. Jayasree Krishnankutty, Director of Extension, Kerala Agricultural University inaugurated the programme. Smt. Ajimol E. K., Deputy Director (Horticulture), Department of Agricultural Development and Farmer's Welfare and Dr. Regi Jacob Thomas, Principal Scientist, CPCRI, Kayamkulam spoke during the occasion. Representatives from Coconut Farmer Producer Companies shared their experiences and views about VFFS.

VFFS was conducted through three Coconut Farmer Producer Companies, viz. Thejaswini Coconut Farmer Producer Company at Thirumeni Cherupuzha, Coconut Farmer Producer Company at Pariyaram and Coconut Farmer Producer Company at Iritty. VFFS will be conducted as monthly sessions on various aspects including

microclimate management, mother palm identification, nursery management, integrated nutrient management, integrated pest and disease management, processing and value addition, creation of coconut service providers etc.

## Amrit Mahostav Year of Coconut Palm in Hatis, Ratnagiri

Hatis villagers celebrated 75th Independence Day and Azadi ka Amrit Mahostav as well as 75th plantation day and Amrit Mahostav Year (2021-22) of coconut palm planted on 15th August 1947 in the premises of Bhairi-Jugai Mandir in Hatis village in Ratnagiri, Maharashtra on 15th August 2021.

Dr. Dilip Nagwekar. Ex. Agronomist of Regional Coconut Research Station, Bhatye, Ratnagiri (Maharashtra) and Ex. Chairman, Hatis Gramvikas Mandal, Hatis had requested the villagers to celebrate 'Amrit Mahostav Year' of the palm by planting 75 coconut seedlings in the surrounding areas of their own house or on the banks of Kajali River on 15th August 2021. Following proper procedure 75 seedlings were purchased from Regional Coconut Research Station, Bhatye and was distributed to the villagers by Dr. Shrirang Kadrekar (Former Vice Chancellor, Dr. B.S.K.K.V. Dapoli), Mr. V. V. Limaye (Ex. Vice Chairman, CDB Kochi), Mariner Dilip Bhatkar (Marine Syndicate Pvt. Ltd., Ratnagiri), Mr. Kumarji Shetye (Ex. Sabhapati (Speaker), Panchayat Samittee, Ratnagiri), Smt. Kanchan Nagwekar Sarpanch, Tembhey-Hatis Gram Panchayat and Vice Chairman Mr. Divakar Nagwekar.

Dr. Kadrekar in his address said that Hatis is probably the only place in India, where a coconut palm was planted on Independence Day and was reared for the last 74 years. He told that the idea of

planting 75 coconut seedlings is good but farmers need to take good care of the palms. Dr. Nagwekar in his introductory remarks spoke on the planting programme. Mr. V. V. Limaye, Mariner Dilip Bhatkar and Mr. Kumarji Shetye spoke during the occasion. Elderly villagers, Shri. Lilakant, Vijay (Baban), Jayvant, Ravindra Nagwekar actively participated in this function. Hatis Gramvikas Mandal members & villagers celebrated Independence Day by hoisting National flag and then garlanding and worshiping the 74 year old coconut palm. Villagers then planted 75 coconut seedlings surrounding their houses and on the banks of Kajali river.

# Cultivation practices in Coconut Garden - October

## Planting

In low lying areas, planting of coconut seedlings can be taken up. Prevent accumulation of rain water in the seedling pits by ensuring adequate drainage. New planting can be undertaken in regions like Tamil Nadu with the commencement of north east monsoon.

## Manuring

Under irrigated conditions, one fourth of the recommended dose of chemical fertilizers can be applied if not given during September. For the coconut seedlings planted during June, first application of chemical fertilizers (one tenth of general recommendation ie 100 g urea, 200 g MOP and 200g rock phosphate) can be given. It is always recommended to apply chemical fertilizers based on the soil test results rather than going by the general recommendations.

Wherever Boron deficiency is noticed 100 g Borax may be applied in the basin. For coconut palms showing yellowing of leaves due to Magnesium deficiency, 0.5 kg of magnesium sulphate can be applied in the basins along with other fertilizers.

## Irrigation

In non-traditional areas of coconut cultivation in eastern and north eastern states, irrigation to coconut palms can be started when the minimum temperature goes below 20$^{o}$C as a protective irrigation. Before starting irrigation a thick mulch should be provided in the basin of coconut palm at 1.8 m radius to a height of minimum 15 cm. In the remaining parts of the coconut growing areas irrigation shall be started depending upon the soil moisture available and withdrawal of monsoon.

## Green manuring

Regions benefitted by north east monsoon like Tamil Nadu, sowing of green manure crops like Sunhemp Crotalaria juncea or Daincha (Sesbania aculeate) or Cow pea (Vigna unguiculata ) or Wild Indigo(Tephrosia purpurea) can be done. In the interspace of coconut gardens under monocropping the following seed rate of green manure seeds is recommended. Sunhemp – 20 kg/ha, Daincha – 30 kg/ha, Cow pea -25 kg/ha and Wild Indigo– 15 kg/ha.

If intercrops are grown, seeds of green manure crops can be sown in the coconut basin of 1.8 m radius. For Cow pea and Daincha seed rate per basin is 100g while for other green manure crops, 75 g seeds can be sown per basin.

## Intercultural operations

Ploughing/digging of interspace is to be undertaken to keep the plantation free of weeds if not done during September. Care should be taken to avoid injury to coconut palm while ploughing.

## Nursery managements

Weeding should be done in the nursery. Five month old ungerminated nuts and dead sprouts should be removed from the nursery. Mulching with coconut leaves or dried grass or live mulch by raising green manure crops can be done in the nursery Irrigation has to be given for seedlings. In localities of Tamil Nadu, which are mostly benefitted by North- East monsoon, sowing of seednuts can be taken up.

## Mulching

Mulching of palm basins can be undertaken if not done during September. Fallen dried coconut leaves available in the coconut garden can be used for mulching.

Adopt mechanical method of control by extracting beetles with beetle hooks, without causing further injury to the growing point of the palm. The top most leaf axils may be filled with powdered neem cake/ marotti cake (Hydrocarpus sp/ pongamia) @ 250 g + fine sand (250g) per palm as a prophylactic measure. Fill the innermost three leaf axils with 4 g each of

naphthalene balls covered with sand (12 g/palm) for juvenile palms. Placement of two perforated sachets containing chlorantraniliprole a.i. 0.4% (5 g) or fipronil (3 g) or one botanical cake (2 g) developed by ICAR-CPCRI can be done. Incorporation of the biomass of weed plant Clerodendron infortunatum Linn. in the cow dung/compost pit can also be taken up. The breeding sites may be treated with green muscardine fungus (*Metarhizium anisopliae*)

## Pest and Disease Management in Coconut

Intermittent precipitation with frequent dry and wet spells makes nut pests and disease at high stake calling for systematic intervention. Immature nut fall and button shedding has been quite rampant in areas receiving frequent rainfall and dry hot and short spells. In general, this is the phase of low nut setting percentage. Adding to climate vulnerabilities, such problems aggravate and to combat these issues a systematic spilt nutrient application and timely intervention of these nut pests and disease is the need for the month. Nuts pests such as coconut eriophyid mite, nut crinkler (coreid bug) and nut borer incidence are reported high in certain coconut growing belts of the country. The management of these nut problems are outlined hereunder.

## I. Cocout eriophyid mite, *Aceria guerreronis*

Coconut eriophyid mite is the invasive pest reported from our country during 1998 and has been on the rise during post-winter season. It belongs to the spider family with two pairs of legs, sub-microscopic (200-250 microns size), lays about 100-150 eggs and the life cycle completed in 7-10 days. Mites infests the developng nuts immediately after pollination and are confined within the floral bracts (tepals) and feeds on the meristematic tissues beneath the

Mite damaged nuts

Progression of mite damage

perianth. Appearance of elongated white streak below the perianth is the first visible symptom. Within few days, yellow halo appears round the perianth, which turns as warts and finally develops as cracks, cuts and gummosis. Shedding of buttons, immature nuts, malformation of nuts are other indications of mite damage.

Mite colony

***Management***

a) Removal and destruction of dried spathes, inflorescence parts and fallen nuts to subdue the pest population

b) Spraying 2% neem-garlic emulsion or azadirachtin 10000 ppm @0.004% or root feeding with neem formulation containing azadirachtin 10000 ppm at 10 ml with equal volume of water three times three times during March-April, October-November and December –January is recommended. Prophylactic application before the increase in summer temperature should be resorted to.

c) Application of talc-based preparation of acaropathogen, Hirsutella thompsonii@ 20 g / litre/ palm containing 1.6 x 108cfu three times in synergy with neem formulation.

d) Kalpaharitha (a selection from Kulasekharam Tall) was found field tolerant to mite damage.

e) Application of recommended dose of fertilizers, recycling of biomass, raising of green manure crops in palm basin and incorporation during flowering, summer irrigation including soil and water conservation measures improve the palm health and reduce the pest attack.

## II. Coreid Bug, *Paradasynus rostratus*

Nymphs and adults puncture the meristematic regions of tender buttons (1-3 months old) injecting toxin around the feeding site causing necrosis. Feeding punctures develop into necrotic lesions and these spindle-shaped depressions could be visible when the perianth of shed button is removed. Female flowers are attacked prior to pollination and


such flowers get dried and can be seen attached to inflorescence on the crown resulting in production of barren buttons. Most of the infested buttons and tender nuts shed down. Retained nuts on the bunch develop furrows and crinkles on their husks and are malformed.

***Management***

- Crown cleaning to destroy eggs and immature stages of the pest
- Spraying of azadirachtin 300 ppm (Nimbecidene) @ 0.0004% (13 ml / l) reduced the pest incidence at the highest level. Two rounds of azadirachtin spray on young coconut bunches 1-5 months old during May-June and September-October are quite essential for satisfactory control of the pest in the field
- Among the natural enemies, the weaver ant, Oecophyllasmaragdinais found to be the most efficient predator of coreid bug in the field.
- Two egg parasitoids, namely *Chrysochal cissaoviceps* and *Gryonhomeoceri*, were identified as potential egg parasitoids. Forty per cent parasitism was observed in the egg mass collected from the field due to these parasitoids.
- Spraying cholrantraniliprole 0.3 ml/litre or lambda cyhalothrin @ 1.0 ml/litre on the pollinated bunches was found effective.

## III. Nut borer, *Cyclodes omma*

Incidence of nut boroer was observed in certain coconut gardens in Pollachi (Tamil Nadu). This is a sporadic pest normally found in dwarf genotypes and also in hybrids. Succulency due to excessive nutrition by nitrogenous fertilizers is also one of the factors responsible for pest outbreak. Caterpillars bore into buttons after pollination as well as immature nuts and feed on the internal contents during night hours, resulting in button shedding. Palms subjected to assisted pollination are more susceptible to pest attack. The pupal stages are observed on the debris of palm crown.

***Management***

a) Crown cleaning and removal of immature stages of the pest

b) Judicious and need based application of nitrogenous fertilizers to avoid succulency

c) Application of the entomopathogen, Bacillus thuringiensis @ 20 g per litre or neem oil 0.5% (5 ml per litre with 10 g soap powder) using hand sprayers would reduce pest incidence.


Nut boring caterpillar


Damaged buttons

## IV. 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 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.

Withering of spear leaf

Bud rot affected palm

- Field sanitation and provide proper drainage during rainy season.
- Placement of two Trichoderma (Trichoderma harzianumCPTD28 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.

## *Nut fall*

Nut fall may be due to genetic/ physiological factors, nutrient imbalance/ deficiency, poor pollination, attack by insects or mites, water logging/drought or fungal infection. Major fungal species associated with nut fall are Phytophthora palmivora and Lasiodiplodia theobromae. In case of Phytophthora palmivora infection water-soaked

Lasiodiplodia infection symptoms

Phytophthora infection symptoms

lesions appear on the surface of the nuts. The lesions turn brown and the nut detaches from the bunch. Phytophthora infection is more common during rainy season and occurs in high humid areas. Nut infection by Lasiodiplodia theobromae appear as dark grey to brown lesions with wavy to undulated margins As infection progresses, decay and discolouration of mesocarp and endosperm of nuts are also observed. Severe infection results in desiccation, shrivelling, deformation and premature dropping of nuts. Lasiodiplodia infection is severe in mite infested nuts and occurs throughout the year. It is seen in dry areas also

***Management***

- Removal and destruction of infected nuts.
- Crown cleaning just before monsoon and spraying of Bordeaux mixture 1% to the bunches. ■

*(Prepared by: Thamban, C. & Subramanian, P., ICAR-CPCRI Kasaragod and Joseph Rajkumar ICAR-CPCRI Regional Station, Kayamkulam)*

# Market Review – August 2021

## Domestic Price

### Coconut Oil

During the month of August 2021 the price of coconut oil opened at Rs. 17400 per quintal at Kochi and at Alappuzha markets and Rs. 18000 per quintal at Kozhikode market.

The price of coconut oil closed at Rs. 17400 per quintal at Kochi and Alappuzha markets and Rs. 17900 per quintal at Kozhikode market with a net loss of Rs. 100 for quintal at Kozhikode market.

During the month the price of coconut oil at Kangayam market opened at Rs. 15167 per quintal and closed at Rs. 14800 per quintal with a net loss of Rs. 367 per quintal.

| Weekly price of coconut oil at major markets Rs/Quintal) | | | | |
|---|---|---|---|---|
| | Kochi | Alappuzha | Kozhikode | Kangayam |
| 02.08.2021 | 17400 | 17400 | 18000 | 15167 |
| 07.08.2021 | 17500 | 17500 | 18000 | 15333 |
| 14.08.2021 | 17500 | 17500 | 18150 | 14933 |
| 21.08.2021 | NR | NR | NR | NR |
| 28.08.2021 | 17400 | 17400 | 17900 | 14667 |
| 31.08.2021 | 17400 | 17400 | 17900 | 14800 |

### Milling copra

During the month, the price of milling copra opened at Rs.10900 per quintal at Kochi and Rs.10650 per quintal at Alappuzha market and Rs. 11000 per quintal at Kozhikode market.

The prices of milling copra closed at Rs. 10750 per quintal at Kochi and Rs. 10650 per quintal at Alappuzha market and Rs. 10800 per quintal at Kozhikode market with a net loss of Rs.150 at Kochi and Rs.200 per quintal at Kozhikode market.

During the month the price of milling copra at Kangayam market opened at Rs. 10200 per quintal and expressed a downward trend and closed at Rs.10100 per quintal.

| Weekly price of Milling Copra at major markets (Rs/Quintal) | | | | |
|---|---|---|---|---|
| | Kochi | Alappuzha (Rasi Copra) | Kozhikode | Kan-gayam |
| 02.08.2021 | 10900 | 10650 | 11000 | 10200 |
| 07.08.2021 | 11000 | 10850 | 11200 | 10300 |
| 14.08.2021 | 10800 | 10850 | 10850 | 10100 |
| 21.08.2021 | NR | NR | NR | NR |
| 28.08.2021 | 10750 | 10650 | 10750 | 10000 |
| 31.08.2021 | 10750 | 10650 | 10800 | 10100 |

### Edible copra

During the month the price of Rajpur copra at Kozhikode market opened at Rs. 18500 and closed at Rs. 19200 per quintal with a net gain of Rs.700 per quintal.

| Weekly price of edible copra at Kozhikode market (Rs/Quintal) | |
|---|---|
| 02.08.2021 | 18500 |
| 07.08.2021 | 18000 |
| 14.08.2021 | 19000 |
| 21.08.2021 | NR |
| 28.08.2021 | 19200 |
| 31.08.2021 | 19200 |

### Ball copra

The price of ball copra at Tiptur market opened at Rs. 16500 per quintal closed at Rs. 16000 per quintal with a net loss of Rs.500 per quintal.

| Weekly price of Ball copra at major markets in Karnataka (Rs/Quintal) (Sorce: Krishimarata vahini) | |
|---|---|
| 02.08.2021 | 16500 |
| 07.08.2021 | 16000 |
| 14.08.2021 | 16500 |
| 21.08.2021 | 16000 |
| 28.08.2021 | 16000 |
| 31.08.2021 | NR |

**NR-Not reported*

### Dry coconut

At Kozhikode market, the price of dry coconut opened at Rs.15750 per quintal and the prices continued at the same level throughout the month.

| Weekly price of Dry Coconut at Kozhikode market (Rs/Quintal) | |
|---|---|
| 02.08.2021 | 15750 |
| 07.08.2021 | 15750 |
| 14.08.2021 | 15750 |
| 21.08.2021 | NR |
| 28.08.2021 | 15750 |
| 31.08.2021 | 15750 |

### Coconut

At Nedumangad market in Kerala, the price of coconut opened and closed at Rs. 16000 per thousand nuts during the month.

At Pollachi market in Tamilnadu, the price of coconut opened at Rs. 29000 and closed at Rs. 28500 per ton during the month.

At Bangalore market in Karnataka, the price of coconut opened at Rs. 27500 and closed at Rs. 22500 per thousand nuts during the month.

| Weekly price of coconut at major markets | | | |
|---|---|---|---|
| | Nedumangad (Rs./1000 coconuts) (Source: Epaper,Kerala Kaumudi) | Pollachi (Rs./MT) (Source: Star market bulletin) | Bangalore Grade-1 coconut, (Rs./ 1000 coconuts) (Source: Krishimarata vahini) |
| 02.08.2021 | 16000 | 29000 | 27500 |
| 07.08.2021 | 16000 | 29000 | 22500 |
| 14.08.2021 | 16000 | 29000 | NR |
| 21.08.2021 | 16000 | NR | 27500 |
| 28.08.2021 | 16000 | 28500 | NR |
| 31.08.2021 | 16000 | 28500 | 22500 |

## 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 | Srilanka | India* |
| 07.08.2021 | 185 | 188 | NR | 394 |
| 14.08.2021 | 184 | 188 | NR | 394 |
| 21.08.2021 | 183 | 187 | NR | NR |
| 28.08.2021 | 184 | 187 | NR | 387 |
| | | | | *Pollachi market |

### Coconut Oil

International price as well as domestic price of coconut oil expressed a downward trend 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* |
| 07.08.2021 | 1528 | NR | 1493 | NR | 2082 |
| 14.08.2021 | 1508 | NR | 1488 | NR | 2027 |
| 21.08.2021 | 1470 | 1425 | 1484 | NR | NR |
| 28.08.2021 | 1438 | NR | 1438 | NR | 1991 |
| | | | | | *Kangayam |

### Copra

The price of copra at Philippines ,and Indonesia expressed a downward trend during the month. The price of copra quoted at different domestic markets in Philippines, Indonesia and India are given below.

| Weekly International price of copra in major copra producing countries | | | | |
|---|---|---|---|---|
| Date | Domestic Price (US$/MT) | | | |
| | Philippines | Indonesia | Srilanka | India* * Kangayam |
| 07.08.2021 | 890 | 934 | NR | 1398 |
| 14.08.2021 | 840 | 925 | NR | 1371 |
| 21.08.2021 | 827 | 905 | NR | NR |
| 28.08.2021 | 825 | 884 | NR | 1358 |
| | | | | * Kangayam |

# Coconut Development Board


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