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Shri. Somireddy Chandramohan Reddy, Hon'ble Minister for Agriculture, Govt. of Andhra Pradesh, delivering the inaugural address.

CDB celebrates World Coconut Day 2017

The Government of Andhra Pradesh is committed in increasing the income of the farmers through scientific coconut cultivation, said Shri. Somireddy Chandramohan Reddy, Hon'ble Minister for Agriculture, Govt. of Andhra Pradesh while inaugurating the World Coconut Day celebration of Coconut Development Board at Vijayawada, Andhra Pradesh. He expressed his happiness on the increased productivity of coconut in the state. Andhra Pradesh is the third largest state in coconut cultivation and stands first in the country in terms of yield, said the Minister.

He said the state government was promoting cultivation of horticulture crops and has given priority to cultivation of coconut. The state government was spending Rs 1,427 crore per annum for promoting coconut production and that it has provided insurance to coconut crop, to protect farmers from risk. The state government is focusing on increasing the area under coconut cultivation and promoting manufacturing of specialised products with coconut, its fibre. Special marketing facilities are being provided to coconut products as products like coconut milk have huge demand overseas, he said.

The regional centre of the Central Plantation Crops Research Institute, which is coming up near Samalkot in Andhra will be of great help to the growers of coconut and other plantation crops. The government of Andhra Pradeh has allotted 60 acres for the centre and the centre will be ready by the end of this year, said the Minister

Andhra Pradesh is the third largest state in coconut cultivation and stands first in the country in terms of yield.

The State government was of the impression that farmers would get better returns from horticulture crops like coconut than from agriculture. From 23 lakh acres in 1992, the area under horticulture crops has increased to 39.5 lakh acres during the previous financial year (2016-17). This increase is mainly because of the subsidies and support given to farmers by the government. This year also the government has earmarked Rs.1,427 crore for the development of horticulture.The Floriculture Research Centre coming up at Kadiyam in Eat Godavari would also be ready by the end of the year. The state government has earmarked Rs.12 crore for its development.

Coconut is associated with the socio-economic aspects of millions of people who directly or indirectly depend on the crop. It provides food, food security, livelihood security, export earning, import substitute and comprehensive protection to small holders and other agro-industries depending on it.

The Minister assured that measures would be taken by the government in creating awareness

Welcome address by Dr. B.N.S. Muthy, Chairman, CDB

among the farmers about best usage of modern technologies and harvesting techniques to earn a good source of income from coconut by-products.

Dr. P Chowdappa, Director, CPCRI who spoke during the occasion informed that CPCRI is setting up a Regional Station in the state. He called upon the farmers to cultivate intercrops like cocoa in coconut gardens for realizing better income from coconut cultivation. The Samalkot centre would have an integrated coconut processing unit and business incubation centre to help farmers become agricultural entrepreneurs. He said smaller countries like Indonesia were making more money than India from their produce.

Dr B N S Murthy , Chairman Coconut Development Board underlined the need for improving coconut cultivation in the coastal area of Andhra Pradesh where the climate is most conducive. He also urged the government to establish a coconut park in the State to encourage the use of coconut by-products like Neera and others which would ensure fruitful business for the farmers. The Board under the direction of Prime Minister Narendra Modi has changed its approach. Instead of giving priority to increase in productivity and average it was concentrating on value addition so that farmers get more income. Coconut farmers do not want subsidy, they only want a better price for their produce, he said.

Shri.Chiranjiv Choudhary IFS, Commissioner of Horticulture, Govt. of Andhra Pradesh in his vote of thanks thanked the Board for conducting the programme in the state and also for implementing more programmes of CDB in the state. He said that the government is committed for the development of horticulture.

The Minister also inaugurated the exhibition on coconut held as part of the programme. Shri. Bonda Uma Maheswara Rao, Hon'ble MLA, Vijayawada, visited the exhibition. Dr.B.N.S.Murthy, Chairman, CDB in his welcome address spoke on the various programmes of the Board implemented in the state for increasing the production and productivity of coconut in the state.

A handbook on integrated management practices in coconut for productivity improvement in Telugu and special edition of the Bharatiya Kobbari Patrika was released during the occasion.

Around 650 farmers from all coconut growing states took part in the programme. A technical session on the theme was held as part of the programme chaired by Dr.P. Chowdappa, Director CPCRI, Kasargod and co-chaired by Shri. Saradindu Das, Chief Coconut Development Officer, CDB. Dr.Vijayakumar, Professor of Cardiology of Amrita Institute of Medical sciences, Kochi spoke on the goodness of coconut oil and its health benefits. Dr.Ramanandam, Prinipal Scientist, Horticulture Research Station, YSR University spoke on coconut cultivation and plant protection and Shri.Sreekumar Poduval, Processing Engineer, CDB spoke on value addition in coconut and assistance under the Technology Mission on Coconut programme of Coconut Development Board. An interactive session of the farmers was also held as part of the programme wherein technical experts cleared the doubts of the farmers on scientific coconut cultivation practices. An exhibition of coconut and its various value added products was held as part of the programme, wherein coconut product manufacturers, FPOs and coconut craftsmen from across the country showcased various value added coconut products and services.

WORLD COCONUT DAY
02nd September 2017

Exhibition

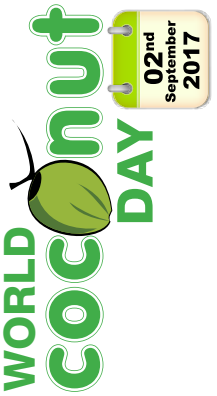
Technical Session

Dr.Vijayakumar

Dr.Ramanandam

Shri.Sreekumar Poduval

Dr.P.Chowdappa



Media Coverage - World Coconut Day 2017

Crop research centre to be ready by year-end

State government allots 60 acres for the purpose, says Minister

Special marketing facilities to sell coconut products abroad

₹1,427crore to boost cultivation

03/09/17 - Sakshi

కొబ్బరి కళ.. మెరిసిన వేళ

అగ్రిహబ్‌గా ఆంధ్రప్రదేశ్: మంత్రి సోమిరెడ్డి

WORLD COCONUT DAY

₹1,427 cr spent for production of coconut-based products

Coconut Oil

Bringing History, Common Sense and Science Together

Dr. Fabian M. Dayrit

Professor, Department of Chemistry, Ateneo de Manila University, Philippines

Chairman, Scientific Advisory Committee for Health, Asian and Pacific Coconut Community

Abstract

The modern Western diet has suffered the damaging effects of trans fats, much of it from soybean oil. It is suffering another blow, this time from the damaging effects of an excess of omega-6 fats, again from soybean oil.

The vast majority of epidemiological studies do not distinguish between coconut oil and animal fat, and simply refer to them collectively as "saturated fat." This is a fatal mistake for two reasons: first, the fatty acid profiles of coconut oil and animal fat are very different, and second, coconut oil hardly has any cholesterol while animal fats contain a lot of cholesterol. This means that the results based on animal fat cannot be applied to coconut oil.

Contrary to the claim of the American Heart Association, there is abundant evidence to show that coconut oil and a coconut diet do not raise the incidence of heart disease and are, in fact, part of many healthy traditional diets. Many populations who shifted from a traditional coconut diet to a Western diet have suffered worse health outcomes. However, the historical and scientific evidence in support of coconut oil may not be enough to convince the AHA which favors a high omega-6 diet.

The 2017 AHA Presidential Advisory has failed to see the forest for the trees. It has failed to see the worsening epidemics of obesity and metabolic disease, but has focused instead on the details of the meta-analysis of LDL and values as if these were more important. The AHA has failed to bring the science together with the reality; there is no wholeness in their analysis.

Food is made up of three principal biochemical groups: protein, carbohydrate and fat. Assuming that one needs to maintain a certain level of energy, a food group cannot be decreased without compensation with another group.The "low fat" recommendation promoted by the AHA and the Dietary Guidelines for Americans since 1980 has resulted in an increase in refined carbohydrates. The American average fat consumption dropped from over 40% to 33% while carbohydrate consumption increased and obesity more than doubled from 14% to 36.5% (CDC,2017).Worldwide obesity has likewise more than doubled since 1980, and by 2014, 13% were obese (WHO, 2016).Meanwhile, heart disease, the principal concern of the AHA and the justification of the Dietary Guidelines, has remained as the main cause of mortality.

> Coconut oil and a coconut diet do not raise the incidence of heart disease and are, in fact, part of many healthy traditional diets.

The AHA and the Dietary Guidelines have led the Americans – and the rest of the world – astray with its warning against fat, especially saturated fat. However, if we go back to the time before the Dietary Guidelines made the world obese, we will find the answer and rediscover what traditional food cultures have been consuming for millennia: the coconut. Contrary to the claims of the AHA, the evidence for coconut oil is based on science and validated by the experience of people.

The modern diet

WHO recommends that the total energy from fat should not exceed 30% along with a shift in fat consumption away from saturated to unsaturated fat and the elimination of industrial trans fats (WHO, 2015). This works out to about 70 grams or about 75 mL of fat. Since we should aim for a healthy total fat diet, how much of each type of fat should we consume? How much saturated fat is desirable and what type should this be? How much unsaturated fat should one have? How can we eliminate industrial trans fats completely? Since there is a trend to decrease the amount of carbohydrates in the diet how should we replace these calories?

It was the rising popularity of coconut oil that may have prompted the AHA to issue its Presidential Advisory. In its discussion of coconut oil, they said: "A recent survey reported that 72% of the American public rated coconut oil as a 'healthy food' compared with 37% of nutritionists. This disconnect between lay and expert opinion can be attributed to the marketing ofcoconut oil in the popular press." The AHA then issued a warning against coconut oil: "because coconut oil increases LDL cholesterol, a cause of CVD, and has no known off setting favorable effects,we advise against the use of coconut oil" (Sacks et al., 2017).

In addition, the AHA unilaterally disposed of the importance of HDL to cancel the favorable effects of coconut oil, an issue that was tackled in the second article in this series (Dayrit, 2017b). The stated objective of the AHA is to limit the consumption of coconut oil down to 6%. This essay will answer these allegations and show that the claims of the AHA are wrong.

The trans fats fiasco

Coconut oil used to enjoy robust consumption in the US from the 1900s up to 1940, when the war interrupted the importation of coconut. During the war, trans fats, much of it from soybean oil, were used to replace coconut oil in food products (Shurtleff & Aoyagi, 2007). After the war, US importation of coconut oil remained low because of the soybean lobby that wanted to retain its market dominance. By 1999, it was estimated that trans fats in the American diet had reached 2.6% of calories (Allison et al., 1999). In 2006, it was estimated that trans fats may have been responsible for 72,000 to 228,000 myocardial infarctions and deaths from CHD in the US (accounting for 6% to 19%) (Mozaffarian et al., 2006).

Over 30 years after the warning against trans fats was first made, the FDA finally set a compromise rule where a manufacturer can declare "zero trans-fats" if the product contains less than 0.5 grams trans fatty acids per serving (FDA, 2003). This ruling actually

does not eliminate trans fats from the food supply; it just hides it.

What is equally lamentable is the AHA's tepid warning against trans fats. Despite the substantial harm that industrial trans fats have made to heart health, the AHA has not issued any advisory against trans fats in the same way that it has attacked saturated fat and coconut oil.

The high omega-6 fiasco

Linoleic acid (C18:2) and linolenic acid (C18:3) are both essential fatty acids. However, international nutrition institutions recommend that only a limited amount should be taken and that a particular ratio should be maintained (Table 1).

Historical use of the coconut

Contrary to the claim of the AHA, there is abundant evidence to show that coconut oil and a coconut diet do not raise the incidence of heart disease and are, in fact, part of many healthy traditional diets. In the remainder of this essay, we will discuss the historical and traditional consumption of the coconut, health statistics of coconut-consuming populations, and a comparison with the Western (mainly American) diet.

Coconut is one of the most ancient and widespread of edible fruits in the world (Lutz, 2011). It is part of the diet and culinary tradition of virtually all countries where the coconut grows. It is also unparalleled in its overall usefulness as a portable source of food and water and many other useful applications.

Miguel de Loarca, a Spanish explorer in the Philippines during the 16th century,observed that "The cocoanuts furnish a nutritious food when rice is scarce" (Blair & Robertson, 1906). It was so useful that the Spanish government in the Philippines decreed the planting of coconuts as a source of raw material and as food for the people, especially during drought.

Among some food cultures in the Pacific islands, the coconut accounts for up to 60% of fat intake. There is no report that the coconut has caused ill-health or disease, except for the occasional death from a falling coconut.

The American Soybean Association is a very powerful industry lobby (https://soygrowers.com/). Soybean oil is a high omega-6 oil, being made up of about 54% C18:2 (Codex, 2015). It was estimated that from 1909 to 1999 the per capita consumption of soybean oil in the US increased over 1,000 times from 0.01 to 11.6 kg/yr and by 1999, the average American consumption of C18:2 was 7.2% of total calories, with an omega-6 to omega-3 ratio of 10:1 (Blasbalg et al., 2011). The modern American diet has become a high omega-6 fat diet.

In 2009, AHA issued a "Science Advisory" in a paper entitled: "Omega-6 Fatty Acids and Risk for Cardiovascular Disease" (Harris et al., 2009). This paper summarized and defended the health benefits of omega-6 fatty acids. However, the ASA Science Advisory ignored the important issue of how much omega-6 fat should be consumed in the diet, and what the ratio of omega-6 to omega-3 fat should be. Numerous papers have pointed out that a high omega-6 diet and a high omega-6 to omega-3 ratio are linked to heart disease, cancer, inflammatory diseases, and others (Simopoulos 2002, 2008, 2010; Lands, 2012). The AHA Science Advisory dodged both important issues and one might surmise that AHA does not want to set a limit for this fat.

However, the AHA acknowledged that other health agencies have set limits to omega-6 in the diet (Table 1),

Table 1. Recommendations for daily intake (in grams) of omega-6 and omega-3, and omega-6 to omega-3 ratio from international institutions.			
Agency	Linoleic acid (C18:2) Omega-6	Linolenic acid (C18:3) Omega-3	Healthy ratio Omega-6 : Omega-3
European Scientific Committee on Food1	2% 5 g* 6.4 g**	0.5% 1 g* 1.6 g**	5 : 1
European Food Safety Authority2	10 g	2 g	5 : 1
World Health Organization3	5-8%	1-2%	5 : 1
1 SCF, 1992. 2 EFSA, 2009. 3 FAO/WHO, 2008.			
* recommendation for women ** recommendation for men			

but it defended its position of not specifying a limit by proclaiming: "The American Heart Association places primary emphasis on healthy eating patterns rather than on specific nutrient targets."

This statement is highly irresponsible: since an excess of omega-6 fat is clearly linked to CHD, how can the AHA not issue a warning? This is also highly hypocritical and suspicious: the AHA refused to set a target for omega-6 fat and yet aggressively set a target of 6% for saturated fat in its Presidential Advisory (Sacks et al., 2017).Why the double standard? Is the AHA protecting omega-6 fats?

This omega-6 fiasco will become a replay of the trans fats disaster, with soybean oil as the beneficiary. Heart disease will remain the first cause of death in the US (and the world!).

Table 2. Comparison of fatty acid profile and cholesterol content of coconut oil and various types of animal fat: butter, beef fat and lard.

Fatty acid	Coconut Oil[1]	Animal fat[2]		
		Butter	Beef fat (tallow)	Lard (hog fat)
C4:0, % butyric acid		3		
C6:0, % caproic acid	1	2		
C8:0, % caprylic acid	7			
C10:0, % capric acid	7	3		
C12:0, % lauric acid	49	4		
C14:0, % myristic acid	19	12	3	2
C16:0, % palmitic acid	9	26	27	27
C18:0, % stearic acid	3	11	7	11
C16:1, % palmitoleic acid		3	11	4
C18:1, % oleic acid	8	28	48	44
C18:2, % linoleic acid	2	2	2	11
C18:3, % linolenic acid	1			
Cholesterol, mg/kg	0 to 3	2150	1090	950

1 Codex, 2015, 2 USDA

Coconut oil, saturated fat, and animal fat: a serious misunderstanding

The vast majority of epidemiological studies do not distinguish between coconut oil and animal fat, and simply refer to them collectively as "saturated fat." This is a serious misunderstanding. Coconut oil is 65% medium-chain saturated fat while the different types of animal fat contain from 40 to 50% long-chain saturated fat, with the rest being mono- and polyunsaturated fat. In addition, coconut oil contains from zero to 3 mg cholesterol per kg(Codex, 2015), while animal fat contains various amounts of cholesterol depending on animal source (USDA, 2017). (Table 2)

Polyunsaturated fat oxidizes readily with heat and in the presence of cholesterol, will produce oxidized cholesterol. Oxidized cholesterol has been shown to accelerate the development of atherosclerosis leading to heart disease (Staprans et al., 2000). This will not happen with coconut oil because there is only a small proportion of unsaturated fat and very little cholesterol. This is a mistake that Ancel Keys made; it is a mistake that many researchers who followed him have made. Therefore, the so-called "high quality" studies that the AHA Presidential Advisory judged as acceptable evidence against coconut oil cannot be admitted as evidence because of this fatal mistake (Sacks et al., 2017).

"Studies on the influence of dietary coconut oil on heart disease and other health factors have shown that there is no negative effect from coconut oil consumption compared with other oils and that in some cases, better health outcomes can be attributed to coconut oil."

Canola oil for coconut oil?

Aside from soybean oil, canola oil is the other beneficiary of the AHA warning. Since the 1990s, the agro industry giant Calgene, which is convinced of the beneficial health properties of lauric acid, has been undertaking genetic engineering experiments on canola oil to produce a high lauric acid GMO, called Laurical 35, which contains 37% lauric acid and 34% oleic acid (Shahidi et al., 2007).As the Canola website declared: "Domestically produced high-laurate canola oil could potentially replace some of the $400 million of tropical oil imported annually, primarily from the Philippines, Malaysia and Indonesia" (Ag Innovation News, 2003). Thus, while the AHA warns against coconut oil, Calgeneis set to enter the lauric oil market with a GM product.

Health of coconut-consuming populations

Studies on the influence of dietary coconut oil on heart disease and other health factors have shown that there is no negative effect from coconut oil consumption compared with other oils and that in some cases, better health outcomes can be attributed to coconut oil.

Numerous studies have documented the absence of negative effects from coconut oil. Prior and co-workers (1981) reported that Polynesians from Pukapuka and Tokelau both consume a high saturated fat diet from coconut oil, 34% and 63%, respectively, and yet vascular disease was uncommon in both populations and there was no evidence of harmful effects in these populations due to their diet. A small study of 32 CHD patients and 16 matched healthy controls from the Indian state of Kerala showed that coconut and coconut oil did not play any role in the causation of CHD in this state (Kumar, 1997). A similar study conducted in West Sumatra, Indonesia, involving 93 CHD patients with a control group showed that consumption of coconut was not a predictor for CHD (Lipoeto et al., 2004).

The association between coconut oil consumption and lipid profiles was studied in a cohort of 1,839 Filipino women (age 35–69 years) over a 22-year period, from 1983 to 2005. Lipid analysis showed that the mean TC, LDL, and triglyceride levels and TC/HDL ratio of the women were within the desirable limits set by WHO and that coconut oil intake may enhance HDL levels (Feranil et al., 2011).

A direct comparison between coconut oil and sunflower oil, a polyunsaturated oil, used as cooking oil was conducted to determine their effect on lipid profile, antioxidant and endothelial status in patients with stable coronary artery disease. This study was conducted for 2 years with 100 coronary artery disease patients and 100 in the healthy control group with 98% follow-up. The results showed that there was no statistically significant difference in the anthropometric, biochemical, vascular function,and cardiovascular events in both groups indicating that coconut oil does not pose any additional risk for heart disease compared with a polyunsaturated fat (Vijayakumar et al., 2016).

On the other hand, there are studies that show better health outcomes in populations that consume coconut oil or a coconut-based diet. In the Philippines, people from the Bicol province who have the highest consumption of coconut showed comparatively low levels of atherosclerosis and heart disease compared with people from other regions in the Philippines who consume less coconut in their diet (Florentino & Aguinaldo, 1987).

The type of fat has a strong influence on obesity

Rural populations of Vanuatu consume fat from traditional sources, which includes coconut, while urban Vanuatu populations consume fat from imported foods, such as oil, margarine, butter, and meat. Despite the fact that rural Vanuatu populations consumed more total calories than the urban population, they had half the prevalence of obesity and diabetes (WHO, 2003).

In the US, it is interesting to note that the states with high coconut consumption – Hawaii and Florida – showed lower rates of heart disease compared to the national average in 2014 (heart disease rate per 100,000): US average (167.0); Hawaii (136.7); Florida (151.3) (KFF, 2017).Similarly, Cuba, a coconut-consuming country that has been spared the Western diet, had a mortality rate from heart disease of 144.8 from 1986 to 1997 (Cañero, 1999).

In summary, dietary studies on populations that consume coconut or coconut oil show no evidence of a higher incidence of heart disease and a number of studies report more favorable health outcomes.

Will there be a science-based conclusion?

In 2016, Eyres and co-workers conducted an assessment of the literature to verify the merits of the claim that coconut consumption had favorable

From a traditional coconut diet to a Western diet

A number of studies have shown that populations that shifted from a traditional coconut diet to a Western diet report poorer health status.In 1973, Ian Prior saw the unique opportunity to observe in detail a real time experiment of the effect that diet can have on Polynesians who migrated from their islands to New Zealand. He recorded mortality from heart disease, hypertensive heart disease, and blood lipids, among others. He concluded his paper with this statement: “The high price being paid by the New Zealand Maori, in terms of morbidity and mortality from a range of cardiovascular and metabolic disorders and the contrast with the picture seen among atoll dwellers, gives a clear indication of how exposure to the ways and diet of Western society can influence health and disease patterns” (Prior, 1973).

A 1999 comparative study among American and Western Samoans showed that a shift to a modern diet increased their carbohydrate and protein consumption and decreased their overall fat, in particular, saturated fat. This shift was identified as the cause of their increased incidence of obesity and cardio vascular disease (Galanis et al. 1999). WHO (2003) reported that Pacific islanders “were 2.2 times more likely to be obese and 2.4 times more likely to be diabetic if they consumed fat from imported foods rather than from traditional fat sources.” Among the most commonly consumed imported fats were vegetable oil and margarine which replaced coconut oil.

effects on cardiovascular risk factors. After reviewing eight clinical trials and 13 observational studies, they concluded that: "Observational evidence suggests that consumption of coconut flesh or squeezed coconut in the context of traditional dietary patterns does not lead to adverse cardiovascular outcomes." Strangely, they ended their paper with this statement: "However, due to large differences in dietary and lifestyle patterns, these findings cannot be applied to a typical Western diet" (Eyres et al., 2016).

Despite the exacting standards of science that Eyres and co-workers applied, why can't these findings be applied to a typical Western diet? The authors did not provide an explanation. With this statement, the authors have effectively put science aside.

Source: https://www.apccsec.org/apccsec/currentissues-4.html

*APCC's Rebuttal to the Presidential Advisory of A*merican Heart *Association (AHA) against coconut oil.*

स्वच्छ भारत
एक कदम स्वच्छता की ओर

CDB Conducted Shramdaan as part of Swachhta Hi Sewa Campaign

As part of 'Swachhta Hi Sewa' (SHS) campaign, the officers and staff of Coconut Development Board, Head Office, Kochi cleaned the office premises. Towards intensifying the focus on cleanliness and create an environment of cleanliness across the country, the Hon'ble Prime Minister of India has called upon the nation to undertake 'Swachhta Hi Sewa' (SHS) from 15th September to 2nd October 2017. Shri. Saradindu Das, Chief Coconut Development Officer and Dr. A.K. Nandi, Secretary, Coconut Development Board led the 'Shramdaan' activities. All the unit offices of the Board are also undertaking similar cleaning activities in the respective office premises.

Enhancing productivity and income from coconut farming in Kerala- need for interventions on soil health management

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Coconut plays a significant role in the cultural and socio-economic life of people of Kerala state. There is no other crop which is so closely interwoven with the daily life of Keralites. However, Kerala state, known as the land of coconut, is gradually loosing its days of coconut prosperity. An analysis of the performance of coconut sector in the state indicates such a trend. Even though Kerala stands first in area and production of coconut among the leading coconut producing states in India its contribution to the total area and production of coconut in the country is declining over the years. Moreover, the productivity of coconut in Kerala is very low and it is less than the national average. Kerala's share in the total area and production of coconut in the country during the year 1956 was 69% and 71% respectively while its share has reduced to 37 % and 34 % respectively during the year 2015.

As per the statistics (2015-16), Kerala state stands first in coconut production in India. With an area of 7,70,620 ha under coconut cultivation, Kerala is having the largest share (37 %) of coconut area in the country. However, during the last decade the area under coconut cultivation in the state is steadily decreasing. In comparison with the year 2005-06 there is a marked reduction of 14% in the area under coconut in the state. Kerala ranks first in coconut production in the country closely followed by Tamil Nadu. As per 2015-16 statistics, coconut production in the state is 7,429 million nuts compared to 6,171 million nuts of Tamil Nadu. Productivity of coconut in the state (9,641 nuts per ha) is below the national average (10,614 nuts per ha) and productivity of Tamil Nadu (13,423 nuts per ha).

Factors such as low price price fluctuation of coconut in the market, predominance of old and senile palms, fragmentation of holdings, absentee landlordism, replacement of coconut land with more remunerative crops, crop loss due to pest and disease incidence, high cost and scarcity of labor leading to the neglect of the crop, lack of irrigation facilities, lack of adoption of recommended crop management practices especially nutrient management etc have contributed to the low productivity and negative growth rate in area and production of the crop in the state. Apart from creating favourable policy environment and implementing appropriate institutional support programmes by the government agencies, efforts are required for implementing a comprehensive coconut rejuvenation scheme, interventions for empowering coconut growers to utilise technologies for enhancing productivity and reducing cost of cultivation, adopting multiple cropping and mixed farming in coconut gardens instead of coconut monocropping and value addition through product diversification to revitalize the coconut sector in the state.

Soil health in coconut gardens

A recently published report on the project coordinated by State Planning Board, Kerala, on the fertility status of soils of Kerala state clearly indicate that soils in the state are nutrient hungry

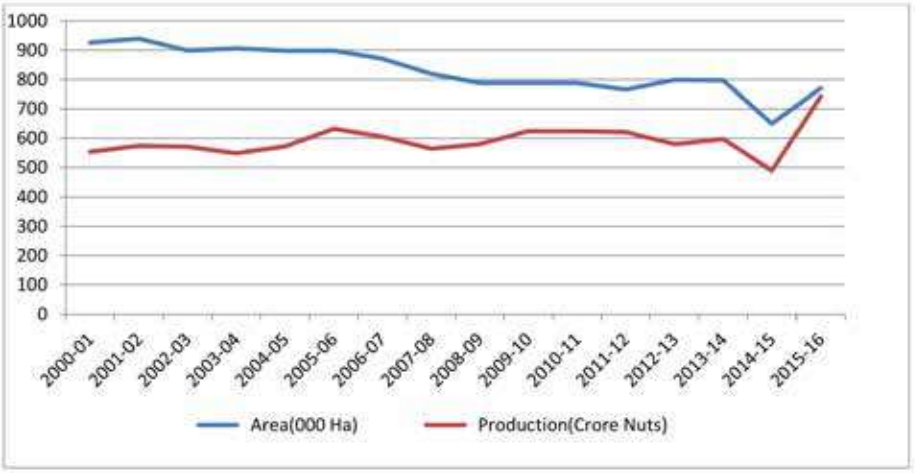

Fig 1.Trend in area and production of coconut in Kerala state

Boron deficiency symptom

and also suffer due to soil acidity adversely affecting productivity of crops like coconut. Strong soil acidity, deficiency of major nutrients especially potassium, extensive deficiency of secondary nutrients like calcium and magnesium and wide spread deficiency of micro-nutrients such as boron are the soil related constraints in coconut growing tracts resulting in poor health and low productivity of coconut palms in the state. Problems due to poor soil health are observed in all the major coconut growing tracts of Northern Kerala, Central Kerala, Southern Kerala and Coastal Sandy Plain (including Onattukara sandy plain) region. Study on assessment of soil fertility in rubber-growing areas has pointed to strong subsoil acidity and high levels of aluminium in soils of Kerala. The aluminium in soil solution can cause root injury to most crop plants.

Soil fertility status of Kerala

Importance of soil health enhancement which holds the key to raising small farm productivity was highlighted in the report on the recommendations by the National Commission on Farmers headed by Dr. M. S. Swaminathan. The commission recommended that "every farm family should be issued with a Soil Health Passbook, which contains integrated information on the physics, chemistry and microbiology of the soil in their farm. More laboratories to detect specific micronutrient deficiencies in soils are urgently needed. Soil organic matter control will have to be increased by incorporating crop residues in the soil. Proper technical advice on the reclamation of wastelands and on improving their biological potential should be available. Pricing policies should promote the balanced and efficient use of fertilizers".

National Mission for Sustainable Agriculture (NMSA) is being implemented by the Department of Agriculture and Co-operation, Ministry of Agriculture & Farmers Welfare with the objective to make agriculture more productive, sustainable and climate resilient; to conserve natural resources; to adopt comprehensive soil health management practices; to optimize utilization of

Table 1. Coconut farming in Kerala state during the last six decades

Year	Area (in thousand ha)	Production (million nuts)	Productivity (Nuts/palm/year)
1956-57	459.7	3182	6921
1966-67	609.6	3424.7	5617
1976-77	695	3348	4817
1986-87	706	3173	4494
1996-97	1006	5834	5802
2006-07	808.6	5921	7322
2015-16	770.6	7429	9641

(Source: Coconut Development Board)

Soil characters	Category	Percentage
Soil reaction (pH)	Extremely acidic(<4.5)	9.5
	Strongly acidic (4.6-5.5)	45.5
	Moderately acidic (5.6-6.5)	36.0
	Neutral & alkaline (>6.5)	9.0
Available Nitrogen	Low	24
	Medium	41
	High	35
Available Phosphorus	Low	19
	Medium	18
	High	63
Available Potassium	Low	33
	Medium	37
	High	30
Available Calcium	Deficient	40
	Adequate	60
Available Magnesium	Deficient	74
	Adequate	26
Available Sulphur	Low	30
	Medium	17
	High	53
Available Zinc	Deficient	12.5
	Adequate	87.5
Available Copper	Deficient	15
	Adequate	85
Available Boron	Deficient	59
	Adequate	41

(Source: Rajasekharan et al 2013. Soil fertility Assessment and Information Management for Enhancing Crop Productivity in Kerala)

water resources; etc. Soil Health Management (SHM) is one of the most important interventions under NMSA. SHM aims at promoting Integrated Nutrient Management (INM) through judicious use of chemical fertilisers including secondary and micro nutrients in conjunction with organic manures and bio-fertilisers for improving soil health and its productivity; strengthening of soil and fertiliser testing facilities to provide soil test based recommendations to farmers for improving soil fertility; ensuring quality control requirements of fertilisers, bio-fertilisers and organic fertilisers under Fertiliser Control Order, 1985; upgradation of skill and knowledge of soil testing laboratory staff, extension staff and farmers through training and demonstrations; promoting organic farming practices etc.

Decentralized planning by the Local Self Governments for sustainable agricultural development and state sector schemes for development of coconut can implement interventions to alleviate the soil related constraints in Kerala state on a priority basis and support available under the National Mission for Sustainable Agriculture needs to be effectively channelized for improving soil health status in coconut holdings in the state to enhance yield and income from coconut farming.

Enhancing the economic viability of coconut based land use systems

Soil related constraints and low level of adoption of soil fertility management practices are among the major factors resulting in the low productivity of coconut palms in the state. Application of manures and fertilizers based on the soil fertility status is important in the integrated nutrient management practices for sustainable coconut production. Studies have indicated that the extent of adoption of recommended nutrient management practices by coconut farmers in the state is very low due to various reasons. Of late, coconut palms in different localities in the state show the symptoms due to soil related constraints including deficiency of nutrients indicating the urgent need to adopt measures to improve the situation through appropriate corrective steps. Substantial improvement in yield can be achieved through appropriate inputs to alleviate soil related constraints and development of management strategies for the palm and the intercrops associated with it, taking into consideration the climatic and soil qualities in coconut–growing tracts across the state. It is imperative that an Agro-Ecological Unit wise perspective is necessary while Best Management Practices for improving soil health in coconut gardens in the state are evolved and validated in farmers' field and subsequently scaled up for wider adoption.

In this background a multi-institutional research-cum-demonstration network project was proposed for enhancing the coconut productivity in the state with the support of State Planning Board, Government of Kerala with National Bureau of Soil Survey and Land Use Planning (ICAR-NBSS&LUP) as the lead institute. Other organizations included Central Plantation Crops Research Institute (ICAR-CPCRI), Central Tuber Crops Research Institute (ICAR-CTCRI), Indian Institute of Spices Research (ICAR-IISR) and Krishi Vigyan Kendras (KVKs) of Alappuzha, Pathanamthitta, Ernakulam and Kozhikode districts. The experiments and demonstrations under the project were laid out in farmers' fields covering the major Agro-Ecological Units across the state. The project sites included Cheruthazham in Kannur district representing Agro-ecological Unit 11, Naduvannur in Kozhikode district representing Agro-Ecological Unit 11, Mookkannoor in Ernakulam district representing Agro-Ecological Unit 10, Chettikulangara in Alappuzha district representing Agro-Ecological Unit 3, Mayyanad in Kollam district representing Agro-Ecological Unit 1 and Pathanamthitta representing Agro-Ecological Unit 9.

The experiments under the project were aimed at characterization of soils for properties relevant to coconut production, sampling and analysis of soil and plant tissue, and interpretation of data sets generated and development of Best Management Practices (BMP) for coconut and intercrops such as pepper, nutmeg, tapioca and elephant foot yam, with focus on soil input management. The BMP were to be validated and demonstrated in selected farmers' field in the identified agro-ecological units. Technological interventions pertaining to the BMP developed under the project include regular input of chemical fertilizers to correct the deficiencies of primary, secondary and micro-nutrients, alleviation of surface soil acidity through liming and subsoil acidity through gypsum application, additional chlorine nutrition of the palm through input of common salt, on-farm recycling of biomass through incorporating coconut leaves alone as organic matter input and reducing cost of cultivation by avoiding basin opening. Farmer participatory demonstration of these interventions are being conducted in each of the six project locations in 10 coconut gardens each with a minimum of 40 coconut palms.

The technological interventions in the experimental/ demonstration plots in farmers' fields started during the year 2015 with the onset of South West Monsoon. Since then the scheduled activities pertaining to

application of inputs and crop management practices are being carried out systematically. It requires a minimum of three years for the improvement in nut yield due to the interventions to get reflected. However, the initial indications of improvement in yield are quite encouraging. Besides, the improvement in soil qualities and palm health were quite substantial in the experimental/demonstration plots pointing towards the beneficial impact of interventions carried out. Improvement in soil health is discernible by increase in soil pH (decrease in soil acidity), for both surface and sub soils and preponderance of earth worms in treated plots. Improvement in coconut palm health is evident in the treated plots through the decline in yellowing, especially in plots in southern Kerala (south of Thrissur district), reduction in visual symptoms of boron deficiency (hooking and fasciations of leaflets), greener fronds and reduction in nut fall, reduction in leaf rot disease and reduction in drooping of fronds due to the increased drought tolerance. From the encouraging initial trends it can reasonably be expected that there would be substantial increase in yield of palms as envisaged in the project with the treatments continued for the ensuing two more years.

Scaling up of soil health management centric production strategy

Taking into cognizance the field level scenario of coconut farming in Kerala state, especially the extent of adoption of soil health management practices and profile characteristics of coconut growers and the encouraging initial results of the farmer participatory research-cum-demonstrations under the State Planning Board supported project, it is imperative that urgent efforts are made for scaling up of the soil health management centric production strategy for enhancing productivity and income from coconut farming. The recently constituted Coconut Co-ordination Committee by the Government of Kerala can bring together all the relevant stakeholders including ICAR-CPCRI, Kerala Agricultural University, Coconut Development Board, Department of Agriculture, KERAFED, Coconut Producers Federation/Companies etc. It is important that institutional mechanism is ensured for convergence of functioning of these agencies for evolving agro-ecology unit wise technology package for soil health management for coconut, assessment and refinement of technology package for soil health management, empowerment of Farmers Producer Organisations (FPOs) on production and marketing of customized fertilizer inputs, facilitating group approach through coconut FPOs and organizing community interventions for enhancing production and value addition with focus on adoption of soil health management practices. In all these activities, meaningful participation of coconut growers is to be ensured for effective implementation. Large scale pilot testing of this approach can be done through the interventions under the scheme for Special Agricultural Zone for coconut to be implemented in Kozhikode district and also through the ongoing 'Keragramam' scheme of the State Department of Agriculture for further scaling up across the state.

Conclusion

Trends in coconut farming in Kerala state clearly indicate that the state is gradually loosing its days of coconut glory. Interventions are needed to be implemented to enhance productivity and income from coconut farming in the state. Apart from comprehensive rejuvenation programme, strategies and schemes focusing on soil health management centric crop production are to be implemented to bring back coconut prosperity. The relevance of such a strategy is quite evident under the ongoing State Planning Board supported project on enhancing the economic viability of coconut based land use systems in Kerala state. ■

Coconut farming in Lakshadweep islands: Scenario and strategies for development

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Lakshadweep, India's smallest Union Territory located in the Arabian sea comprises of 36 tiny coral islands with 32 square kilometers in area and a population of 64,429 (2011 census) in the ten inhabited islands. Coconut is very closely associated with the socio-economic and cultural life of the people of Lakshadweep. Besides fishing, coconut cultivation and production and marketing of copra constitute the major livelihood option of Lakshadweep. Farming activities in these islands are essentially coconut based and hence efforts for improving agriculture sector in the islands need to focus on interventions to enhance the efficiency of coconut based activities.

Coconut farming sector in Lakshadweep: Scenario and strategies for enhancing efficiency

Details of area and production of coconut, as per 2015-16 statistics, in different islands of Lakshadweep are furnished below,

Island	Area (ha)	Production (Lakh nuts)
Kavaratti	402.53	1.22
Agatti	348.14	1.24
Amini	251.83	1.17
Kadmat	310.29	0.73
Kiltan	151.6	0.66
Chetlat	102.21	0.47
Bitra	8.78	0.34
Andrott	472.24	1.58
Kalpeni	266.96	0.92
Minicoy	436.34	0.77
Total	2750.92	9.07

(Source: Department of Agriculture, U.T of Lakshadweep)

Though coconut palms are available in abundance in all the islands, coconut is not cultivated in a systematic and scientific manner due to various socio-economic and other factors. Major constraints to coconut farming in Lakshadweep include: predominance of senile and unproductive palms, overcrowding of palms due to lack of adoption of proper spacing which result in low productivity, lack of adoption of multiple cropping and integrated farming practices, lack of availability of skilled palm climbers, crop loss due to pests like rodents and diseases like bud rot, low level of product diversification, lack of storage and marketing facilities, inadequacy of extension support etc.

The regional station of ICAR- Central Plantation Crops Research Institute (CPCRI) located at Minicoy island has evolved many technological recommendations for enhancing productivity and income from coconut farming in Lakshadweep islands. Similarly, Department of Agriculture, UT of Lakshadweep has been implementing various schemes to improve coconut farming in the islands. Incentives are being provided to farmers for taking up various activities under these schemes.

Some of the strategies suggested for enhancing the efficiency of coconut sector in Lakshdweep islands are discussed hereunder.

i) Conservation and utilization of coconut genetic resources:

Laccadive Ordinary Tall (LCT) is the well adapted predominant variety of coconut in Lakshadweep islands. Many other distinct coconut accessions have been collected from different islands and conserved at National Gene Bank at CPCRI, Kasaragod and CPCRI, Research Centre, Kidu. Special types such as Micro Talls, Giant coconuts, Sweet husked coconuts, types with higher oil content, lines with putative drought tolerance, dwarf coconuts and Mini Micro nuts have also been collected and conserved in the gene bank. Utilizing the germplasm lines collected from Lakshadweep, LCT selection was released as Chandrakalpa, suitable for growing under rainfed conditions in the coconut growing areas. Laccadive Orange Dwarf (LCOD) has been identified to be an ideal cultivar for tender coconut purpose with early-bearing palms, orange fruits with water content of over 300 ml. Out of the conserved germplasm from Lakshadweep islands, two accessions namely Laccadive micro Tall , Laccadive mini micro Tall were registered with NBPGR for their unique traits. Based on the nut yield and copra out turn, two hybrids viz., LCGD x LCT, LCOD x LCT were identified and recommended by the Institute Research Committee of CPCRI for commercial exploitation under Lakshadweep conditions.

Variability observed in the nuts collected from Minicoy (Source: CPCRI Technical Bulletin No.86)

Cutting and removal of senile and unproductive palms and scientific replanting by maintaining optimum plant density need to be emphasised while formulating schemes for enhancing efficiency of coconut sector in the islands. Coconut genetic resources available in these islands can be effectively utilised for the production and distribution of quality seedlings of suitable coconut varieties as part of coconut rejuvenation schemes to be implemented.

ii) Maintenance of optimum palm density:

The recommended spacing for planting coconut is 7.5 m so that 175 palms can be accommodated in one hectare of land. Maintenance of optimum palm density is essential for realising high productivity in coconut. However, overcrowding of palms without adoption of proper spacing is an important factor resulting in low yield of coconut in all the islands of Lakshadweep. It is observed that on an average of 400-500 coconut palms of all ages is available in one hectare of land. The observations at CPCRI Minicoy research centre revealed that the average yield in the normal density during 1983-2001 was 129 nuts per

palm per year as against 37 nuts per palm per year in double density of planting. Hence, it is obvious that interventions for restructuring coconut orchards to thin down the palm population to maintain optimum palm density are needed for enhancing coconut productivity in the islands. Such interventions to avoid overcrowding of palms also will reduce the crop loss due to rodent infestation in coconut palms.

iii) Soil health management for improving coconut productivity:

As per the official policy for the UT of Lakshadweep, use of chemicals in farming is prohibited and agriculture in the islands is organic by default. However, lack of availability of quality organic manure is a limiting factor in promoting eco-friendly crop production practices in the islands. The technology for vermicomposting using coconut leaves, which are available in plenty in these islands, has been standardized by CPCRI using Eudrilus sp. of earth worms closely related to the African night crawler. This simple technology can be effectively made use of for ensuring availability of quality organic manure required for coconut and other crops. Popularisation of green manure crops can be another intervention to improve soil fertility. Observations made at CPCRI, Minicoy research centre has revealed that Sunnhemp (Crotolaria juncea) can be introduced as a green manure crop and its growth under island conditions was excellent and the yield obtained was 11.5 t/ha. The NPK content was 0.75%, 0.12 % and 0.51% and the percentage of contribution was estimated to be 98 for N and 28 each for P and K.

iv) Crop intensification in coconut gardens:

People of Lakshadweep islands mostly depend on the mainland for their requirement of fruits and vegetables. Extent of adoption of inter/mixed cropping in coconut orchards is very low. Further, the overcrowding of coconut palms does not allow much of inter/mixed cropping also. However, if restructuring of coconut gardens is done to maintain optimum palm density, the potential for profitable cultivation of fruits and vegetables can be effectively utilised. Observations at Minicoy regional station of CPCRI has shown that the most suitable varieties of fruit crops identified for island systems were banana, papaya, sapota and vegetables crops such as tomato, brinjal, chilli, bhindi, amaranth, cabbage, cauliflower, cucurbits and moringa. Improved varieties of tomato (Arka Meghali, Arka Alok, Co 3), brinjal (Arka Anand and Co 2), chilli (Arka Lohit, Arka Harita, and Co 4), bhindi (Arka Anamika), amaranth (Arka Arunima, Arka Samraksha), cabbage (Ankura manas), cauliflower (F 1 Hybrid white), bitter gourd (Ventura), pumpkin (Arka Chandan and Arka Suryamukhi), cowpea (Arka Garima) and moringa (PKM 1) were successfully demonstrated at the centre in an area of about 35 cents of coconut garden using different organic inputs such as poultry manure, cowdung, coconut leaf vermicompost, neem cake and Pongamia cake. It is imperative that appropriate schemes are introduced to popularise coconut based intercropping of vegetables and fruit crops so as to enhance food and nutritional security of island community.

v) Eco-friendly technologies for pest and disease management:

It is estimated that rodent attack causes 33-44% damage to coconut palms in the islands. Major reasons attributed for the increased rat damage in the island are higher density of coconut palms per unit area, inadequate crown cleaning and delayed harvest of nuts, heaping fallen fronds and husks in the farm, absence of predators like snakes, owls etc. in the islands, and improper care provided to the coconut palms. Placing rat cake over the crown was recommended by the CPCRI Minicoy station. CPCRI has also developed a device by which any

number of rat cakes can be placed in the coconut crown from the ground. Rhinoceros beetle or black beetle (Oryctes rhinoceros) damage in the islands is less than 5%. Oryctes rhinoceros nudivirus was released in Lakshadweep Islands for the first time during 1990's and it was very effective in the bio-suppression of the beetle. To address the problem of lack of availability of skilled palm climbers for harvesting as well as plant protection measures, a scheme on coconut harvesting is implemented by the Department of Agriculture, UT of Lakshadweep through Village Dweep Panchayaths (VDPs). Under this scheme coconut farmers are provided with the service of climbers who are insured under coconut climber's insurance scheme implemented by the department. The climber needs to harvest 15 palms per day. The farmer has to pay an amount of 15/- per palm harvest. The Department will pay the remaining amount of wages/honorarium fixed to the climbers. Department of Agriculture also implements specific schemes for the management of rodents and bud rot disease. The components of rodent management scheme include placing rat cakes on the crown of the palms, using different types of rat traps, crop and field sanitation etc. To prevent the spread of bud rot disease coconut growers are provided with incentives for cutting and removal of dead palms and badly affected palms which are beyond recovery. There was a considerable reduction in the bud rot disease incidence since the implementation of the scheme in the year 2014-15.

Coconut oil marketed by LDCL

vi) Value addition through product diversification:

Copra, coconut oil, coir and coir products, neera (coconut inflorescence sap) and coconut jaggery are the major coconut based traditional enterprises available in the islands. Copra making is done in the traditional method of sun drying. Right from harvesting, dehusking, cutting, drying, deshelling and packing in gunny bags is done manually. It is then transported to the mainland (mainly Mangalore) through local goods ship locally called as 'uru'. Using the money obtained by selling copra all house hold items required for the next season are purchased and brought to the islands. A few small copra milling units are running in the islands to meet the cooking oil requirement. With the government support, five coir fibre factories, five production demonstration centres and seven fibre curling units run in Lakshadweep islands. These units produce coir fibre, coir yarn, and curled fibre and corridor mattings. Coconut is the key ingredient in all the culinary preparations of the islands. There are a number of recipes using fresh matured kernel, half matured kernel and tender kernel. Besides, sap production and utilization of the sap for fresh consumption and spread/ sugar production is also followed. Many sweets are made from coconut sugar which has unique taste and good shelf life.

Though tremendous opportunities exist for enhancing income from coconut farming through production and marketing of value added products, coconut based processing industries are very meager in the islands. The technology of neera collection and sugar production was demonstrated by CPCRI in the islands and 3-5 tappers were trained for collection of neera using 'Coco- sap chiller'. Department of Agriculture is implementing a scheme for promoting neera tapping in the islands. As part of the scheme, neera tappers are engaged from the village dweep panchayath and the Department pay the honorarium. Neera thus collected is sold to the public in the form of neera, vinegar and jaggery. Lakshadweep Development Corporation Ltd. (LDCL) under the Lakshadweep Administration also promotes traditional products of the islands. LDCL has supported the enterprises on value added products from fish through its canning factory at Minicoy and five coconut processing units located at Kadmat, Amini, Androth, Kalpeni and Agatti. Of late, an entrepreneur from Androth island has started producing coconut oil under the brand 'Dweep fresh' and exporting to the Middle East.

Desiccated coconut unit in Kadmat island under LDCL

Desiccated coconut (DC) unit of Kadmat island was established in 1993. The unit provides employment for 20 workers from the island itself. In this unit monthly 30,000-40,000 nuts are processed for the production of desiccated coconut powder. Production capacity is 1500-1800 coconuts/ day. Coconuts are procured from local coconut farmers. Dehusking, deshelling and testa removing are done manually. There is a machine for cutting and cleaning of the kernel. It is then disintegrated using a disintegrator, followed by drying (45 min/batch), sieving and packing. The co-products generated during processing are well utilized. Coconut husks

DC production: process flow

are sold to the coir manufacturing factory situated in the same island. The shells are used as fuel in the boiler. The testa is dried in a dryer and used for expelling oil. About 90-120 kg desiccated powder is obtained by processing 1500-1800 nuts. Presently it is marketed through the outlet of LDCL, at Kochi. Apart from that, it is sold locally at Rs. 150/ kg. Its maximum retail price is Rs. 210/ kg. During the tourist season (October- March), DC powder has good demand as it is made from organically produced coconuts. The unit also has an oil expelling unit. Filtered coconut oil is sold at Rs. 170 per Litre. In addition to that, small quantity of virgin coconut oil and coconut chips is also processed as and when order comes. Presently LDCL, Kochi is the only outlet for marketing DC powder. However, outlets available for marketing the DC in other localities can also be explored, especially by highlighting the special feature of 'DC processed from organically grown coconuts from the Islands'. The process chain can be completely mechanized for producing export quality DC powder from Lakshadweep.

vii) Promoting Farmer Producer Organisations (FPOs) in coconut sector:

The average land holding size in the islands is only 0.27 ha. Hence, it imperative that group approach is facilitated among the small and marginal farmers of the island to enable them to overcome the resource limitations and to effectively make use of technologies for higher productivity and income from coconut farming. Currently Department of Agriculture, UT of Lakshadweep has taken steps to initiate nine Coconut Producer Societies in different islands to take up various interventions to strengthen the coconut sector and enhance income from coconut farming. It is necessary that in all the islands of Lakshadweep such coconut growers' collectives are formed to take up coconut production, processing and marketing initiatives. Self help groups of women also need to be supported to take up coconut based microenterprises

viii) Co-ordination among stakeholders:

Interventions for enhancing efficiency of coconut sector in Lakshadweep islands to be effective, need concerted and coordinated efforts of various stakeholders including research institutions like CPCRI, CIARI, KAU, development agencies such as Department of Agriculture of UT of Lakshadweep, Lakshadweep Development Corporation Ltd. (LDCL), KVK, CDB, Local Self Governments (Village Dweep Panchayats), Coconut Farmer Producer Organisations, Women Self Help Groups and private entrepreneurs.

Conclusion

Coconut is very closely associated with the socio-economic and cultural life of the people of Lakshadweep islands. The potential for achieving higher productivity and income from coconut farming has not been fully realized in these islands due to various reasons. Coconut rejuvenation programme to replace the senile and unproductive palms, restructuring orchards to achieve optimum level of palm density, promoting soil health management practices, promoting intercropping of fruits and vegetables, popularising eco-friendly pest and disease management technologies and promoting enterprises on coconut value addition are some of the strategies suggested for improving coconut scenario in the islands. Group approach has to be promoted among coconut growers of the islands to make the coconut based interventions effective. Co-ordinated efforts of various agencies are also essential for effectively implementing the integrated schemes for coconut development in Lakshadweep islands.■

CDB celebrates 19th World Coconut Day across the country

Kochi, Kerala

Kerala State Agriculture Department will formulate action plans focused on the coconut farming sector in Kerala based on the campaign 'Kera Keralam Samrudha Kerala' following a decision taken by the State government and the Agriculture Department to observe the period from August 2017 to August 2018 as the Year of Coconut, said Shri. V S Sunilkumar, Agriculture Minister, Government of Kerala. He was inaugurating the World Coconut Day celebration of Coconut Development Board at Kochi on 2nd September 2017.The State government is exploring the scope of developing Kozhikode into a coconut marketing hub and the Vengeri agricultural market into a coconut-centric international market, said the Minister. A meeting of coconut farmers, companies, scientists and experts will be convened in Kozhikode in October. Work on Kerala's first coconut-based Agropark is fast progressing in Kozhikode.The Minister felicitated three coconut farmers for their unique farming methods. Minister opined that there was conscious effort on the part of doctors in the state to prevent people from using coconut oil. Virgin coconut oil is in great demand in countries like USA, where virgin coconut oil has got the status of a super food. On the contrary, cardiologists in our country have been vociferously campaigning against virgin coconut oil making people believe that the use of coconut oil is harmful to health and can cause heart diseases, "The doctors advise people to avoid coconut oil and instead use other edible oil. This is a conscious attempt by doctors in the state to prevent people from using coconut oil. It looks like doctors here are working for edible oil lobby. The advice by doctors to avoid coconut oil and instead use edible oils to avoid health issues has adversely affected the coconut oil industry."

In his presidential address, Prof. K.V. Thomas, MP, Eranakulam urged the Central and State governments to join hands for the betterment of coconut sector. Coconut oil is having good demand everywhere especially in the Gulf countries. He hoped that the world coconut day celebration would be beneficial for the growth of coconut sector.

Shri. Hibi Eden, MLA, Ernakulam released special issues of Indian Nalikera Journal and Indian Coconut Journal. Shri. P C Mohanan Master, Vice Chairman of the Board handed over financial assistance of the Board to eligible entrepreneurs and Shri. P R Muraleedharan, Board Member distributd the planting materials. Adv. J Venugopalan Nair, Chairman, Kerafed, Dr. R Krishnakumar, Director, CPCRI, Kayamkulam and Shri. A M Sunilkumar, Director, Department of Agriculture spoke during the occasion. Shri. R Jnanadevan, Deputy Director, CDB deliverd the welcome address and Shri. K S Sebastian, Assistant Director, CDB proposed vote of thanks.

A technical session on coconut was held as part of the programme wherein Dr. C Thamban, Principal Scientist, CPCRI and Dr. Remany Gopalakrishnan former Director, CDB presented papers on theme topic. Shri. M Thomas Mathew, former CCDO of CDB was the moderator of the session. Around 250 coconut farmers and officials from across the state took part in the programme.

World Coconut Day
Kochi, Kerala

Patna, Bihar

Coconut Development Board , Regional Office, Patna celebreated World Coconut Day at ICAR Research Complex for Eastern Region, Bihar Veterinary College, Patna Campus.Dr. Shambu Kumar, Principal Scientist and Station Head, Central Potato Research Station, Patna inaugurated the programme.Dr. R K Singh, former CCDO,CDB delivered the introductory remarks and Dr. J S Mishra, Principal Scientist, Crop Division delivered the presidential address. Shri. Pawan Kumar, Deputy Director, Department of Horticulture, Dr. Sangeetha Kumari, Assistant Professor, Agriculture Reserch Institute, Patna, Dr.Aravind Kumar, Project Coordinator, KVK, Lakshisarai, Dr.Amarendra Kumar, Senior Scientist, National Research Centre, Litchi, Dr.Rakesh Kumar, Deputy Director, Department of Horticulture, Dr. Rajesh Kumar, Assistant Professor, Agriculture Research Institute, Dr.Aravind Kumar, Technical Officer, Rice Development Directorate, Patna,Shri. Shailesh Kumar,Station in Charge, Central Integrated Pest Management Centre and Shri. Pankaj Kumar, Technical Officer ,CDB Patna attended the programme. The inaugural session was followed by a technical session wherein Dr.Amarendra Kumar, Senior Scientist spoke on the importance of coconut and its uses, Dr. Sangeetha Kumari, Assistant Professor spoke on coconut cultivation and Shri. Rajiv Bhushan Prasad, Deputy Director, CDB spoke on integrated pest and disease management. More than 150 farmers took part in the programme. Shri. Pankaj Kumar, Technical; Officer, CDB proposed a vote of thanks.

DSP Farm Kondagaon

Coconut Development Board, DSP Farm Kondagaon celebrated World coconut Day on 2nd September 2017 at DSP Farm Kondagaon. The chief guest of the programme Shri. Sameer Vishnoi IAS District Collector, Kondagaon inaugurated the programme.

Shri. Vedpal Singh, Assistant Director, Coconut Development Board, Kondagaon delivered the welcome address. Special guest of the programme Dr. Neha Kapoor, Deputy Collector Kondagaon District spoke during the occasion. Shri Kamlesh Sahu, Assistant Director Department of Horticulture Kondagaon, briefed on the benefits of coconut cultivation in Chhattisgarh State especially in Bastar Region.

Shri. Vedpal Singh, Assistant Director, Coconut Development Board Kondagaon spoke on the theme of this year's world coconut day, viz, A Healthy Wealthy life with Coconut. He briefed about the activities of Coconut Development Board and about the various schemes implemented by the Board for the benefit of coconut farmers.

The Chief Guest of the programme, Shri. Sameer Vishnoi (IAS) District collector, Kondagaon District appreciated the initiatives of Coconut Development Board for the well being of the coconut farmers. More than 100 farmers from different villages of Kondagaon attended the programme. Shri. Kamalendu Deb, Assistant, Coconut Development Board proposed vote of thanks.

Bhubaneswar

Coconut Development Board, State Centre and DSP farm, Pitapally, Odisha organised World Coconut Day at IMAGE, Bhubaneswar on 2nd September 2017. Dr. Muthukumar, IAS, Director of Horticulture, Government of Odisha was the Chief Guest of the function and Dr. Biswanath Rath, Board Member was the Special Guest. Dr(Mrs). Jatindra Kishtwaria, Director, Central Institute for Women in Agriculture and Dr. Govinda Acharya, Principal Scientist & Head of CHES,ICAR were the Guests of Honour. Dr. Rajat Kr Pal, Dy. Director, CDB, Odisha welcomed the participants from Directorate of Horticulture, Govt of Odisha, ICAR organisations, Coir Board, NABARD, KVK, NGOs and Coconut Producer Societies and progressive farmers. He spoke on the significance of World Coconut Day and the theme , a healthy wealthy life with coconut. Further, he briefed on the activities of the State centre of CDB in Odisha and on the status of coconut cultivation in Orissa. Dr. Muthukumar IAS in his address informed that India has earned Rs.1400 crore last year by exporting coconut products. He added that one coconut farmer may earn upto Rs,1,20,000 from 1 ha. through scientific cultivation of hybrid palm and Rs.2--3 lakhs through integrated farming practices. Dr.Biswanath Rath, Board Member, who spoke during the occasion informed that coconut seedlings are available at subsidised rate of Rs.10 per seedlings through area expansion programme of CDB. But farmers are to be informed about it. E-marketing of coconut will be started soon. Dr(Mrs) Jatinder Kishtwaria spoke on the role of women in agricultural activities and the scope of skill development for women in coconut field. Dr.G.C.Acharya spoke on the various measures for enhancing farmers income from unit holdings through integrated farming practices.

The programme was followed by a technical session chaired by Dr,Sudarshan Panda, Retd. Director of Horticulture, Govt. Of Odisha.Dr.S.C.Sahoo, Asso.Prof & Coordinator, AICRP spoke on opportunities & challenges in coconut cultivation in Odisha. Dr.G.C.Acharya, Principal Scientist & Head, CHES, ICAR spoke on 'income generation through integrated farming in Coconut'. Dr.(Mrs) Chitropala Debadarshini, Asst.Prof. OUAT, spoke on value added products of coconut and Smt.Nirupama Mishra, Dy.Manager (Tech), APICOL under Govt of Odisha briefed on the support for promotion of coconut processing units in Odisha'. She spoke about the procedure of online application, preparation of DPR through govt agencies, submission to the District Nodal Office etc.

The technical session ended with an interface with farmers in the presence of Dr.S. C. Sahoo, OUAT, Dr.G.C.Acharya, CHES, Dr.Biswanath Rath, Board Member and Dr.R.K.Pal, Dy.Director, CDB. The meeting was concluded with vote of thanks by Mr.R.N.Das, SFO, CDB Odisha. A booklet on Coconut Cultivation Technology in Odiya was released during the occasion. An exhibition of coconut products was conducted as part of the programme.

West Bengal

The World Coconut Day was celebrated by CDB State Centre, West Bengal by organizing a Workshop on Coconut at Ramakrishna Mission Vivekananda University in association with Ramakrishna Mission Vivekananda University, Belur Math, Howrah, Kolkata on 2nd September 2017. Shri Khokan Debnath, Deputy Director welcomed dignitaries and spoke on the importance of World Coconut Day, the foundation day of the Asia Pacific Coconut Community. Shri. Purnendu Basu, Minister in Charge, Department of Agriculture, Govt. of West Bengal was the chief guest and Swami Atmapriyanandaji Maharaj, Vice Chancellor, Ramakrishna Mission Vivekananda University, Belur Math, Howrah, presided over the programme.

Shri. Purnendu Basu, Minister-in-charge Department of Agriculture appreciated Coconut Development Board for the various developmental activities undertaken for the integrated development of coconut cultivation and industry in the state of West Bengal. He was very much impressed about the different activities of the Board particularly FOCT training. He emphasized on the need for production of high quality coconut seedlings in the different government farms of the state, to meet the increasing huge demand of the farmers. He called upon the farmers to go in for value addition of coconut and Neera production, so that the income of the marginal and small farmers can be increased manifold.

Shri. Dibyendu Sarkar, IAS, Commissioner, MGNREGS advised the farming community to take up coconut cultivation in the State as a traditional crop and increase the area of coconut so that various coconut by-product units can be established in West Bengal. He requested to make convergence with MGNERGS for the development of small and marginal coconut farmers of the state. In his presidential address, Swami Atmapriyanandaji Maharaj expressed his happiness on different schemes of the Board implemented in the state for the upliftment of the socio economic condition of the farmers.

Dr. Atanu Dutta Majumdar and Shri. Ashish Kumar Lahiri, Additional Directors of Agriculture who spoke during the occasion advised the farmers to avail the assistance of the Board for improving the income from coconut cultivation in the state.

More than 680 farmers & other stake holders from across the state participated in the World Coconut Day celebration. Scientist from KVK, ICAR institute, BCKV and departmental officials attended the programme. Dr. Narayan Chandra Sahu, Programme Coordinator, SSKVK, RAMVU, Narendrapur, Kolkata proposed vote of thanks.

Inaugural Session was followed by a technical Session chaired by Prof. Apurba Bandopadhyaya, Faculty of Horticulture, B. C. K. V, Mohanpur and co-chaired by Dr. Narayan Chandra Sahu, Senior Scientist & Head, SSKVK, Narendrapur.

Prof Apurba Bandopadhyaya, Faculty of Horticulture, B.C.K.V, Mohanpur spoke on the utilities of coconut, its products and by products. He also briefed on the production of Neera in the state. Dr. Kinkar Saha, Entomologist, Rice Research Centre, Chinsurah, spoke on “Integrated Management of Pests of Coconut”. Sri Khokan Debnath, Deputy Director made a presentation on formation of Coconut Producers Society, Coconut Producers Federations & Coconut Producers Company in West Bengal and different schemes implemented in the state. Doubts on different aspects of coconut cultivation, marketing and industry raised by the farmers were clarified by the scientists.

Regional Office, Guwahati, Assam

Coconut Development Board, Regional Office, Guwahati in collaboration with DSP farm Abhayapuri, Bongaigaon and DSP farm Hichachara, Tripura celebrated World Coconut Day 2017 at Rubber Board Conference Hall, Dispur, Guwahati on 2nd September 2017. Shri Ravindra Kumar, TO, Guwahati welcomed the gathering. Shri Amlan Baruah, IAS, Commissioner and Secretary to the Govt. of Assam, Dr. Alpana Das, Scientist i/c, CPCRI, Kahikuchi, Shri Haren Phukan, President, Pathar Parichalana Samittee, Assam, Shri S. Selvaraj, Jt. Rubber Production Commissioner, Rubber Board, Guwahati and Shri Puran Chetry, Chairman, FPOs Assam were present during the ocassion. Around 100 farmers from Assam, Tripura and Nagaland attended the programme.

Shri L. Obed, Director, Coconut Development Board in his key note address explained about the importance of World Coconut Day and theme of World Coconut Day 2017. He briefly elaborated on the Assam scenario of coconut cultivation and activities of Regional Office Guwahati. He further spoke on the economic value and uses of coconut. He informed that around Rs. two crore rupees can be earned from production of broom in Assam.

Shri Amlan Baruah, IAS, Commissioner and Secretary of Agriculture Department to the Govt. of Assam spoke about the constraints of coconut cultivation and said that North- Eastern region is a gift of god with its fertile land. He emphasized on commercial cultivation of coconut with quality planting material and scientific cultivation practice for the upliftment of coconut farmers in Assam.

Dr. Alpana Das, Scientist i/c, CPCRI, Kahikuchi, in her address described about Bari culture of coconut plantation in Assam. She informed about the Prime Minister scheme "Sankalp Se Siddhi" and encouraged young farmers to take up integrated farming and processing of coconut on commercial scale.

Shri S. Selvaraj, Jt. Rubber Production Commissioner, Rubber Board spoke on the mythological value of coconut and origin of Coconut. He also mentioned that Rubber Board is promoting coconut cultivation by planting coconut in the boundary of Rubber gardens in Assam.

Shri. Haren Phukan, President, Pathar Parichalana Samittee, Assam in his address informed that coconut cultivation of upper Assam can be increased by formation of RPSs and CPSs.

In the technical session, Dr. Alpana Das, Scientist i/c made a presentation on Coconut cultivation Technology and insect-pest management. Shri Puran Chetry, Chairman, FPOs, Assam spoke on the benefits of Farmer Producer Companies and FPOs in Assam. Shri Ravindra Kumar, Technical Officer briefed on Board's schemes.

Exhibition was held at the venue showcasing various value added products of coconut. The programme ended with vote of thanks by Shri B. Bara, Farm Manager i/c, DSP farm Abhayapuri. ■

Myanmar delegation visited CDB

A delegation from Myanmar visited Coconut Development Board on 21st September 2017 and had discussion with Shri. Saradindu Das, Chief Coconut Development officer and other senior officials of CDB. The delegation consisted of Mr. Mya Han, Chairman, Mr. Boo Thein, Vice Chairman, Mr. Kyaw Thein Khine, Director and Mr. Oo Myint Kyaw, Executive Director of M/s Rakhine Development Corporation Limited and Mr. K.K. Jaigopal, Marketing Director, AEEPL, Dreamineer. The team discussed on the new technologies developed in Coconut Development Board and also seeked advice on adoption of new technologies.

The company is working on a project on setting up an integrated coconut processing unit at Rakhine, a coastal state of Myanmar with coconut cultivation for Coconut milk, Virgin coconut oil, Coconut water, Desiccated coconut powder, Activated carbon and Coir products. Shri. Sardar Singh Choyal, Deputy Director, CDB briefed on the activities of the Board to the delegation.

ICAR- AICRP on Palms Centres celebrates World Coconut Day

The World coconut day was celebrated at Coconut centres of AICRP on Palms, with various functions like interactive discussions among scientists, entrepreneurs and farmers, exhibition, distribution of seedlings, field visit etc. at Arsikere (Karnataka), Ambajipeta (Andhra Pradesh), Aliyarnagar and Veppankulam (Tamil Nadu), Kahikuchi (Assam), CCARI Old Goa, Ratnagiri (Maharashtra), Jagdalpur (Chhattisgarh) and Mondouri (West Bengal).

Arsikere

The "World Coconut Day" on the theme "Coconut for family nutrition" was celebrated at AICRP on palms, (HRES), Arsikere. Nearly 500 progressive farmers from various parts of the state attended the programme, which was inaugurated by Dr. H. P. Maheswarappa, Project Coordinator AICRP on Palms, ICAR-CPCRI. In his address, he emphasized the efforts made by scientists under AICRP on palms to tackle the repercussions of continuous drought being faced by farmers of coconut growing areas and also emphasised on the issues related to moisture conservation and efficient management of pest and diseases to cope up the situation. Dr. V. Nachegowda, Director of Research, University of Horticulture Sciences, Bagalkot presided over the function. Shri Hulivan Gangadarayya spoke on "Neera and other by-products of coconut". Progressive farmers Mrs. Hema Ananth and Manjunath spoke on the successful adoption of coconut technologies to achieve higher returns.

Ambajipeta

The World coconut day was celebrated on 2nd September 2017 as National programme by Coconut Development Board, State Centre, Vijayawada, Andhra Pradesh with the technical support of Dr.YSR Horticultural University, AICRP on Palms, Horticultural Research Station, Ambajipeta and in collaboration with Department of Horticulture Govt. of Andhra Pradesh. An exhibition was arranged by different stake holders on processing & value addition. The Horticultural Research Station, Ambajipeta displayed live specimens of parasitoids, samples of different coconut varieties/Hybrids, production, protection technologies and value added products. A technical session was held, wherein Dr.G. Ramanandam, Principal Scientist (Hort.) & Head made a detailed power point presentation on the role of quality planting material and good management practices in sustaining coconut yields. Another lecture on the incidence of insect pest in coconut and its management duly giving emphasis on bio control based management practices was made by Dr. N.B.V. Chalapathi Rao, Senior Scientist (Ent.), disease management in coconut was done by Dr. Snehalatha Rani, Scientist (Path.), Horticultural Research Station, Kovvur.

ICAR-CCARI Old Goa

World Coconut day was celebrated at ICAR-CCARI Old Goa with support from ICAR-AICRP on Palms-Goa centre and ICAR-KVK North Goa and ICAR-CCARI Old Goa. The inaugural ceremony was chaired by Dr EB Chakurkar Director (A) ICAR-CCARI Old Goa. Dr V. Arunachalam, Principal Scientist (Horticulture) & in-charge ICAR-AICRP on Palms-Goa centre and Mr RS Joshi, Directorate of Agriculture Government of Goa were present during the occassion. A demo on the use of coconut tree climbing device, root feeding and manure application was also held. The farmers actively interacted with the experts and clarified their doubts on various aspects of coconut cultivation and utilization.

Aliyarnagar

The World Coconut Day 2017 was jointly organized by Coimbatore Coconut Producer Company, Coconut Development Board and Vinayaga Coconut Producers Company at PA College of Engineering and Technology, Pollachi. The honourable ministers of Tamil Nadu, Thiru. R. Duraikkannu, Minister of Agriculture, Thiru. S. P. Velumani, Urban Development Minister and Dr. Pollachi V. Jeyaraman, Deputy Speaker of Tamil Nadu assembly addressed the gathering. Farmers – scientists interactive meeting was held under the chairmanship of Dr. K. Rajamanickam, Professor (Entomology). Various queries raised by the farmers regarding coconut improvement, production and protection technologies were

answered by the scientists of Coconut Research Station, TNAU, Aliyarnagar. Around 1000 coconut farmers participated and benefited from the programme. An exhibition stall was arranged on behalf of CRS, TNAU, Aliyarnagar in which various coconut production technologies, varieties, bio inputs, etc. were displayed for the benefit of all the coconut farmers. A booklet on Coconut Cultivation Technologies was released during the session.

Veppankulam

Dr.V.Ravi, Director, Tamil Nadu Rice Research Institute, Aduthurai, Dr.K.Ganesamurthy, Director, Centre for Plant Breeding and Genetics, TNAU, Coimbatore, Dr.K.Chozhan, Dean, RVS Agricultural College, Thanjavur and Joint Directors of Agriculture, Thiruvarur districts participated in the programme and spoke during the programme. Dr.D. Saraladevi, Dean, Horticultural College and Research Institute (Women), Tiruchirappalli delivered a special address on the importance of high yielding coconut varieties/ hybrids and improved technologies on coconut cultivation. Progressive farmers Thiru. Balakrishnan, Pandian, Ramamoorthy and Dhanapal shared their experience. Around 250 coconut farmers participated in the World Coconut Day function. Exhibition and skilled demonstrations (fertilizer application, root feeding, Bordeaux mixture preparation) were organized for the benefit of coconut farmers.

Mondouri

"World Coconut Day" was celebrated at the APC Roy hall of Directorate of Research, BCKV, Kalyani on 2nd September. Nearly 100 farmers from various parts of state took part in the programme. Prof. D. D. Patra, Hon'ble Vice Chancellor, BCKV presided over the function. Prof K Brahmachari, Director EE, Dr S Mitra, Director of Farms, Dr R N Biswas, Hon'ble MLA, Kalyani attended the programme. Scientists from different departments spoke on organic cultivation of coconut, coconut processing, plant protection in coconut and disease management in coconut.

Bhatye, Ratnagiri

A rally of coconut growers and entrepreneurs was organized on the occasion of world coconut day on 2nd September, 2017 at Seminar hall, Fisheries College, Ratnagiri. Dr. S.B. Kadrekar, Ex-Vice Chancellor, Dr. B.S.K.K.V., Dapoli, inaugurated the programme by releasing the pamphlet on "Improved management practices for coconut eriophyid mite" and underlined the importance of coconut in processing industries. Dr. S.G. Bhave, Director, Extension Education.

Dr. P.M. Haldankar, Director of Research, Shri. Rajabhau Limaye, Ex-Vice Chairman, Coconut Development Board, Dr. Anil Joshi, President, "Shriphal Utpadak Sangh, Ratnagiri and Dr. Raghvendra Pai, Associate Dean, College of Fisheries, Shirgaon were present on the occasion.

Kahikuchi

A programme was organized at the Farmers' Field at Singra at Kamrup district by All India Coordinated Research Project on Palms (Horticultural Research Station), Kahikuchi Guwahati, Assam. Planting of coconut seedlings was done in one of the farmers' field as block plantation which was initiated under TSP programme of the station.

The programme included awareness generation, training, method demonstration and farmer-scientist interaction. Various queries of the participants on coconut cultivation were clarified by the scientists during the interaction session which included issues like nursery management, planting method and disease and pest management. Around 100 farmers participated in the programme.

Jagdalpur

World coconut day was celebrated on 2nd September 2017 with inclusive lecture presentation and farmers' field visit. Shri. D.K. Bhoyar, Joint Director of Agricluture, Bastar zone, was the chief guest. Dr. S.C. Mukherjee, Dean SGCARS, Jagdalpur and Dr. D.S.Thakur, Dean, College of Horticulture, Jagdlapur were present during the occasion. Shri Bhoyar in his speech, indicated that coconut cultivation can increase the income of farmers and could be a better source of doubling the income and livelihood. Further Dr. Mukherjee pointed out the cultivation practices of coconut trees and recommended the farmers for planting at least five coconut trees per household. Shri P.K. Salam, Scientist of AICRP on Palms presented the overall status of project and spoke on 'Suitable coconut varieties for Bastar'. Around 80 coconut farmers of different villages such as Tandpal, Tokapal, Biringpal, Lamker, Bodanpal and students of SGCARS, Jagdalpur attended the programme. At the end of programme about 50 coconut plants were distributed among farmers to promote coconut cultivation in Bastar.

• *Report prepared by* ***H. P. Maheswarappa and N. R. Dhatri*** *, All India Coordinated Research Project on Palms, ICAR-Central Plantation Crops Research Institute, Kasaragod- 671 124*

World Coconut Day Celebrations at CPCRI, Kasaragod

Various programmes were organised at ICAR-Central Plantation Crops Research Institute, Kasaragod in connection with the World coconut day celebrations. Competitions were held for the students on essay writing, painting and elocution. A total of 124 students representing eight schools participated in the programme. Quiz competition for farmers with the focal theme on 'Coconut for prosperity' was conducted by involving farmers from four localities of Kasaragod district where Keragramam scheme is being implemented. A competition on coconut recipe preparation was held for women. A total of 31 coconut recipes were prepared and exhibited by the 16 women participants. Training programme on 'Effective utilisation of technologies for higher productivity in coconut' was conducted as part of the World Coconut Day celebrations. Valedictory function of World coconut day celebrations was held on 22nd September 2017 in which Mr. Bimal Ghosh, Deputy Director of Agriculture, Kasaragod was the Guest of Honour. In his address, Mr. Bimal Ghosh emphasised the need for strengthening Farmer Producer Organisations in coconut sector to facilitate group approach to enhance yield and income from coconut farming. Dr. P Chowdappa, Director, ICAR-CPCRI presided over the valedictory function. Dr. C.Thamban, Principal Scientist and Acting Head, Division of Social Sciences welcomed the gathering. Dr. K P Chandran, Senior Scientist proposed vote of thanks.

Workshop on neera and its value added products

Coconut Development Board organized a state level workshop on Neera and its value added products at Vijayawada on 3rd September 2017. Dr.P.Lakshmi Narasimham IAS, Special Commissioner of Excise, Government of Andhra Pradesh, Shri.Chiranjiv Choudhary IFS, Commissioner of Horticulture, Govt of Andhra Pradesh, Shri Saradindu Das, Chief Coconut Development Officer, CDB, Dr.P.Chowdappa, Director, CPCRI, Kasargod, Dr J.Dilip Babu, Director of Research and Shri Hemchandra, Director, CDB participated in the meeting. Officials from Coconut Development Board, Department of Horticulture and Excise Department, Government of Andhra Pradesh, representatives of 125 Farmer Producer Organizations (FPOs) and Scientists from HRS, Dr.Y.S.R. Horticulture University attended the workshop.

Shri Saradindu Das, Chief Coconut Development Officer in his welcome address spoke on the initiatives of CDB in promoting FPOs in Neera extraction, processing and marketing. Dr.J.Dilip Babu, Director of Research, Dr.Y.S.R.Horticulture University; West Godavari in his introductory remarks spoke on the importance of coconut in the economy of Andhra Pradesh and called upon the FPOs to take advantage of the changing scenario in coconut value addition.

Dr.P.Lakshmi Narasimham IAS, Special Commissioner of Excise, Government of Andhra Pradesh, the chief guest of the workshop in his keynote address detailed about the health benefits of natural products especially Neera. He extended full support and cooperation of the Excise department for the FPO's in this new venture. Shri Chiranjiv Choudhary IFS in his address informed about the recent amendments in Andhra Pradesh excise act enabling the CPFs affiliated to CPCs and CDB to extract and process neera. He highlighted the challenges involved in training neera technician and positioning Neera as one of the health and nutritional drink in the market.

1 Shri.Chiranjiv Choudhary IFS

2 Dr.P.Chowdappa

3 The invitees

In the technical session which followed, Shri P.Vinod Kumar, CEO, Palakkad Coconut Producer Company Ltd made a presentation on Neera Processing Technology and DPR- A CPC Prerspective. He detailed about the experience of M/s PCPCL in neera extraction, processing and marketing. This was followed by presentation by Shri Parameswaran, Regional Manager,Alfalaval Machineries. He explained in detailed about the machineries available for processing neera.

Shri.Sreekumar Poduval, Processing Engineer, CIT,CDB made a presentation on neera production and processing technologies. He explained that the shelf life of Neera can be extended to one year under refrigerated condition and 30 days under ambient conditions by following the technology developed by CDB.

A brief talk on coconut Neera, its collection and quality evaluation study in Andhra Pradesh was made by Shri.P.C.Vengaiah, Scientist, Food Processing, Dr.Y.S.R.Horticulture University. He explained in detail about neera collection and quality examination of neera.

Dr.P.Chowdappa, Director, CPCRI, Kasargod presented the technology developed by CPCRI and mode of collection and processing. He detailed about the existing techniques followed by the tappers in extracting neera and the scientific reason for maintaining hygiene and cold chain in processing neera. He informed that under irrigated conditions, neera can be extracted for a period of over six months and an average yield of two litres of neera per day per palm is possible under good management conditions.

An interactive session was also held wherein the farmers cleared doubts regarding Neera production and processing. Shri Jayanath R, Dy Director i/c CDB, State Cente proposed vote of thanks .

4 Shri. Saradindu Das

5 Shri.Sreekumar Poduval

6 Dr.P.Lakshmi Narasimham IAS

7 Shri.P.C.Vengaiah

8 Shri P.Vinod Kumar

Market review – August 2017

Domestic price

Coconut Oil

During August 2017 the price of coconut oil opened at Rs. 14700 per quintal at Kochi market, Rs. 14600 per quintal at Alappuzha market and Rs.15500 per quintal at Kozhikode market. The price movement in all three markets in Kerala expressed an upward trend.

The price of coconut oil closed at Rs.15500 per quintal at Kochi market, Rs.15300 per quintal at Alappuzha market and Rs.16800 per quintal at Kozhikode market with a net gain of Rs.800, Rs.700, and Rs. 1300 per quintal respectively.

The price of coconut oil at Kangayam market in Tamilnadu, which opened at Rs.12667 per quintal, expressed an erratic trend during the first fortnight, then expressed upward trend and closed at Rs.13600 per quintal with a net gain of Rs.933 per quintal.

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

	Kochi	Alappuzha	Kozhikode	Kangayam
01.08.2017	14700	14600	15500	12667
06.08.2017	14900	14900	16000	12533
13.08.2017	15000	14900	16200	12667
20.08.2017	15200	15200	16500	13067
27.08.2017	15200	15200	16500	13200
31.08.2017	15500	15300	16800	13600

Milling copra

The price of milling copra at major markets moved in tune with the prices of coconut oil. During the month, the price of milling copra opened at Rs.10000 per quintal at Kochi, Rs.9600 per quintal at Alappuzha market and Rs.10000 per quintal at Kozhikode market. The price of milling copra also expressed an overall upward trend in all three markets during the month.

The prices closed at Rs.10600 at Kochi, Rs.10200 per quintal at Alappuzha market and Rs.10900 at Kozhikode markets with a net gain of Rs.600 per quintal at Kochi and Alappuzha market and Rs.900 per quintal at Kozhikode market.

At Kangayam market in Tamilnadu, the prices expressed an upward trend. The prices opened at Rs.8700 and closed at Rs. 9700 per quintal with a net gain of Rs.1000 per quintal.

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

	Kochi	Alappuzha (Rasi Copra)	Kozhikode	Kan-gayam
01.08.2017	10000	9600	10000	8700
06.08.2017	10100	9800	10350	8900
13.08.2017	10150	9800	10500	9100
20.08.2017	10300	10100	10650	9300
27.08.2017	10300	10100	10650	9400
31.08.2017	10600	10200	10900	9700

Edible copra

The price of Rajapur copra at Kozhikode market which opened at Rs.9800 per quintal expressed an unprecedented steep upward trend during the month. The prices closed at Rs.12800 per quintal with a net gain of Rs.3000 per quintal.

Table3 :Weekly price of edible copra at Kozhikode market (Rs/Quintal)	
01.08.2017	9800
06.08.2017	10000
13.08.2017	10900
20.08.2017	11700
27.08.2017	12500
31.08.2017	12800

Ball copra

The price of ball copra at Tiptur market which opened at Rs.8600 per quintal expressed a steep upward trend during the month and closed at Rs.12500 with a net gain of Rs.3900 per quintal.

Table 4 : Weekly price of Ball copra at major markets in Karnataka (Rs/Quintal)	
	Tiptur
01.08.2017	8600
06.08.2017	9100
13.08.2017	9670
20.08.2017	10500
27.08.2017	11400
31.08.2017	12500

Dry coconut

At Kozhikode market, the price of dry coconut opened at Rs.7100 per quintal. The price expressed an upward trend during the month and closed at Rs.8500 with a net gain of Rs.1400 per quintal.

Table5 : Weekly price of Dry Coconut at Kozhikode market (Rs/1000 coconuts)	
01.08.2017	7100
06.08.2017	7100
13.08.2017	7300
20.08.2017	7700
27.08.2017	8150
31.08.2017	8500

Coconut

At Nedumangad market the price of partially dehusked coconut opened at Rs. 14000 and ruled at same price throughout the month. At Pollachi market in Tamil Nadu, the price of coconut opened at Rs. 12000 and closed at Rs.14000 per thousand nuts with a net gain of Rs.2000 per thousand nuts. At Bangalore APMC, the price of partially dehusked coconut opened at Rs.14000 per thousand nuts and closed at Rs.13750 per thousand nuts with a net loss of Rs.250. At Mangalore APMC market the price of partially dehusked coconut of grade-I quality opened at Rs.21000 per thousand nuts and closed at Rs.21500 per thousand nuts with a net gain of Rs.500 per thousand nuts.

Table 6: Weekly price of coconut at major markets (Rs /1000 coconuts)				
	Neduman-gad	Pollachi	Banglore	Mangalore (Grade-1)
01.08.2017	14000	12000	14000	21000
06.08.2017	14000	12000	14000	21000
13.08.2017	14000	13000	15000	21000
20.08.2017	14000	13000	13000	21000
27.08.2017	14000	14000	13000	21000
31.08.2017	14000	14000	13750	21500

Tender coconut

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

Table7 : Weekly price of tender coconut at Maddur market (Rs/1000 coconuts)	
01.08.2017	10000
06.08.2017	10000
13.08.2017	10000
20.08.2017	10000
27.08.2017	10000
31.08.2017	10000

International price

Coconut oil

The international and domestic price of coconut oil at Philippines and Indonesia expressed a fluctuating trend during the month. The price of coconut oil quoted at different international/ domestic markets is given below.

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

	International Price(US$/MT)	Domestic Price(US$/MT)		
	Philippines/ Indonesia (CIF Europe)	Philippines	Indonesia	India*
05.08.2017	1599	1575	1568	2328
12.08.2017	1640	1618	1622	2344
19.08.2017	1546	1619	1622	2375
26.08.2017	1559	1596	1600	2375

* Kochi Market

Copra

The domestic price of copra at Philippines, Indonesia and Srilanka expressed a fluctuating trend during the month whereas the price of copra in India expressed a slight upward trend.

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

	Domestic Price(US$/MT)			
	Philippines	Indonesia	Srilanka	India*
05.08.2017	945	928	1529	1578
12.08.2017	967	955	1429	1586
19.08.2017	962	955	1515	1609
26.08.2017	961	955	1515	1609

* Kochi Market

Desiccated coconut

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

Table 10: Weekly price of desiccated coconut during August 2017

	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India*
05.08.2017	2668	2460	3062	2598
12.08.2017	2502	2430	3019	2614
19.08.2017	2502	2430	3390	2738
26.08.2017	2502	2430	3260	2846

*FOB

Coconut

The price of dehusked coconut in Philippines, Indonesia and Srilanka expressed a slightly declining trend during the month. However the price in India showed upward trend. The price of coconut quoted at different domestic markets in Philippines, Indonesia, Srilanka and India are given below.

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

Date	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India*
05.08.2017	204	255	328	430
12.08.2017	208	240	320	445
19.08.2017	188	225	312	469
26.08.2017	187	225	302	484

*Pollachi market

Coconut shell charcoal

The weekly average FOB price of coconut shell charcoal in Philippines, Indonesia, Srilanka and India during the month of August 2017 are as follows.

Table 12: Weekly price of coconut shell charcoal during August 2017

Date	Domestic Price(US$/MT)			
	Philippines	Indonesia	Srilanka	India
05.08.2017	430	465	530	476
12.08.2017	430	464	492	485
19.08.2017	430	464	325	488
26.08.2017	430	464	326	490

*FOB

Monthly operations in coconut gardens - October

Andaman & Nicobar Islands: Apply organic manures like dried compost /cow dung@ 40 kg or poultry manure @ 5 kg/palm in the basin taken at a distance of two m away from the bole of the palm in a depth of 2-3 inch. Cover it with soil. New planting of quality seedlings can be undertaken with a density of 150 seedlings per hectare. Prevent accumulation of rain water in the pits. Plant perennial intercrops such as clove, nutmeg, cinnamon, pepper and banana. Control rhinoceros beetle by releasing baculovirus treated beetles @ 15 beetles/ha. Remove the affected bark tissues on the stem and apply five per cent calixin on the wound and also apply warm coal tar if stem bleeding is noticed. Monitor the prevalence of bud rot disease and cut and remove all the affected tissues of the crown and apply 10 per cent bordeaux mixture and cover with polythene to protect it from rain water till normal shoot emerges in case of bud rot disease affected palms. Remove the weeds from the plantation.

Andhra Pradesh: Plant one year old seedlings in the main field. Apply the second dose of fertilizers i.e. 750 g urea, 1300g single superphosphate and 1250 g muriate of potash per adult palm.

Assam: Apply the second dose of fertilizers if not applied during September. Start the post monsoon prophylactic spraying of the palms with one per cent bordeaux mixture in areas where bud rot disease is noticed. Incorporate the weed plant Clerodendron infortunatum in the breeding grounds to destroy the grubs and eggs of rhinoceros beetle. Fill the youngest three leaf axils with a mixture of 250 g powdered marotti/ neem cake with equal volume of sand or place naphthalene balls (12 g/ palm) and cover them with sand thrice a year. Keep the nursery free of weeds. Irrigate the nursery if necessary. If stem bleeding is noticed, remove the affected tissues on the stem and apply five per cent calixin on the wound followed by coal tar. Tie or prop up bunches to prevent buckling.

Bihar / Madhya Pradesh: Remove weeds from the garden. Apply the second dose of fertilizers after the monsoon @ 250 g Urea, 500 g Single Super Phosphate and 500 g Muriate of Potash per palm if applied in 3 splits. Apply fertilizer in basin taken around the palm at a radius of 1.8 m and cover with top soil. Fertilizer application should be followed by irrigation. Crown cleaning should be done to avoid infections during winter season. Apply Blitox @ 5 g/ litre and Dithane M 45 @ 2 g/litre on the crown and bunches alternatively to avoid secondary infections during winter and continue upto February. Sow horse gram or cow pea in coconut basins during mid October after fertilizer application as mulch crops which will help the maintenance of micro climate, moisture conservation and nitrogen fixation in the soil.

Karnataka: Prepare land for new planting. Discard seedlings which have not attained proper growth in the nursery. Application of second dose of fertilizer may be taken up. Clean the crowns of the palms by removing dried and old spathes. As a control measure of rhinoceros beetle, incorporate the weed plant Clerodendron infortunatum in the breeding grounds to destroy the grubs and eggs of the beetle. Fill the youngest three leaf axils with a mixture of 250

g powdered marotti/ neem cake with equal volume of sand or place naphthalene balls (12 g/ palm) and cover them with sand thrice a year. Treat manure pits and other possible breeding sites with carbaryl 0.1 per cent which is to be repeated every three months. As a prophylactic measure, spray bordeaux mixture to avoid the infestation of bud rot.

Kerala/Lakshadweep: Check for the incidence of stem bleeding. If found infected, remove the affected bark tissues on the stem and apply 5 percent calixin on the wound. When this is dry apply warm coal tar. Apply 5 kg neem cake per palm per year along with the second dose of fertilizer. If the attack of the mite is noticed, spray neem oil - garlic - soap emulsion 2 percent (20 ml neem oil + 20 g garlic emulsion + 5 g soap in 1 litre water) or commercial botanical pesticides containing azadirachtin 0.004 per cent @ 4ml per litre of water on bunches, especially on the perianth region of buttons and affected nuts or root feed neem formulations containing azadirachtin 5 per cent @ 7.5 ml with equal volume of water.

Maharashtra/Goa/Gujarat: Plough the garden and make channels for irrigating the palms. Pile up mounds in sandy soils. Remove ungerminated and dead sprouts from the nursery.

Orissa: Initiate sowing of green manure crop seeds in the coconut basins. Incorporate green leaf manures in the coconut basins. Plant/sow intercrops like seasonal intercrops and vegetables. Keep the nursery free of weeds. If the attack of pests and diseases are noticed apply plant protection chemicals. Clean the crown and apply organic manures. Other maintenance operations to coconut as well as the intercrops also may be initiated.

Tamil Nadu / Puducherry: Apply the second dose of fertilizers, i.e. 500g urea, 800g single superphosphate and 800g muriate of potash per adult palm (under rain fed conditions). Incorporate it well in the soil and cover with soil immediately after the application of fertilizers. Check for the incidence of stem bleeding. If found infected, remove the affected bark tissues on the stem and apply 5 percent calixin on the wound. When this is dry apply warm coal tar. Apply 5 kg. neem cake per palm per year along with the second dose of fertilizer. If the attack of the mite is noticed, spray neem oil - garlic soap emulsion 2 percent (20 ml neem oil + 20 g garlic emulsion + 5 g soap in 1 litre water) or commercial botanical pesticides containing azadirachtin 0.004 per cent @ 4ml per litre of water on bunches, especially on the perianth region of buttons and affected nuts or root feed neem formulations containing azadirachtin 5 per cent @ 7.5 ml with equal volume of water.

Tripura: Clean the crown if not done in the earlier month. Application of plant protection chemicals and fertilizer should be followed if not done last month.

West Bengal: Incorporate green manure crop in the soil. Apply organic manure such as dried cow dung/ dried compost@ 40 kg or vermi compost @ 20 kg/tree if not applied during the previous month in the basin at a distance between 1.5m and 2 m away from the bole of the tree in a depth of 2-3 inch. Cover it with soil. Plough the inter space and plant early varieties of winter vegetables, oil seeds or pulses. Look for crown chocking especially in north Bengal. If noticed, apply borax@ 100 g per palm. Hand weed the nursery and provide partial shade to young seedlings. Support newly planted seedlings with suitable props. Tie or prop up bunches to prevent buckling. Start harvesting of matured nuts. Look for insect damage and disease symptoms. Hook out the rhinoceros beetles and fill the top three leaf axils with a mixture of 250 g powdered marotti/ neem cake with equal volume of sand or place naphthalene balls(12 g/ palm) and cover them with sand thrice a year. Check the palms for bud rot. If bud rot is found, remove the affected parts, apply bordeaux paste and cover with polythene sheet or plastic bucket. Spray the neighbouring palms/ seedlings with 1.0 per cent bordeaux mixture. If stem bleeding is noticed, remove the affected bark, apply 5 per cent calixin on the wound and the next day apply coal tar. Root feed 5 per cent calixin (5 ml in 100 ml water) once in every three months and apply 5 kg neem cake per palm per year along with second dose of fertilizers. If the attack of the mite is noticed, spray neem oil - garlic - soap emulsion 2 percent (20 ml neem oil + 20 gm garlic emulsion + 5 gm soap in 1 litre water) or commercial botanical pesticides containing azadirachtin 0.004 per cent @ 4ml per litre of water on bunches, especially on the perianth region of buttons and affected nuts or root feed neem formulations containing azadirachtin 5 per cent @ 7.5 ml ■