Vol.LXVI No. 03 September- 2023 Pages-40 Price: Rs.6

Indian Coconut Journal

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WORLD COCONUT DAY 2023

INDIAN
COCONUT
JOURNAL
Vol. LXVI No.03
September- 2023
Kochi - 11

Publisher
COCONUT DEVELOPMENT BOARD
Ministry of Agriculture and Farmer's Welfare,
Department of Agriculture, Government of India
Kera Bhavan, Kochi - 682 011, India

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SUBSCRIPTION

Annual	Rs. 60.00
Single Copy	Rs. 6.00
Institutes / Libraries	
Annual	Rs. 200.00
Single Copy	Rs. 20.00

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

Coconut Development Board

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

Functions

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

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

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

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Dear friends,

The coconut growing countries across the globe had celebrated World Coconut Day on September 2nd on the theme "Sustaining coconut sector for the present and future generations". The theme has all the more relevance in the current context. For any sector to be sustainable, the producers should benefit; the sector should be able to provide for economic development of the stakeholder along with prospective employment. In the case of the coconut, the prices which started falling in March 2022 have decreased considerably and reached an all time low this year. The Price Support Scheme of Government of India is operational in the major coconut growing states and procurement at Minimum Support Price (MSP) is continuing in producing areas which has provided relief to the small holder farmers. But at the same time it should also be a matter of concern that procurement at MSP can only provide an interim relief to the farmers. The underlying factor in this scenario of price fall is not visible which is more detrimental to the sector and needs to be addressed.

Coconut sector experiences acute volatility in prices. The realization of prices for coconut has the most significant impact on the management of the crop by the farmers who are predominantly small and marginal. Better prices motivate the farmers to manage the farm through adequate fertilization and pest and disease management. When prices fall low, coconut gardens are neglected which will ultimately lead to decreased productivity and thereby reduced yield. When sustaining the sector for the present generation is encountering multitude of challenges, a concentrated thought process has to go into while planning for ensuring sustainability for future generations.

Efficient post harvest management, processing and creation of efficient supply chain for marketing of products are often described as the "one-size-fits-all" solution for any horticultural produce. Processing and value addition of coconut is gaining momentum in India though processing to innovative products other than copra, coconut oil and desiccated coconut started after the advent of the 21st century. Stabilization in the processing sector and equipping the entrepreneurs with state of the art technology, quality and packaging will take time. In the mean while, the potential avenues offered by coconut crop could be explored for realization of remunerative prices and sustenance of the sector.

Management of scientific cultivation in coconut through reduction of costs and increase in productivity is one way of increasing returns. Aggregation of farmers to farmer groups will aid in collectivization of farmers ultimately resulting in increased bargaining power and reduction of costs. Planned harvesting of coconuts by farmer groups, integrating tender coconut and mature coconut harvesting will not only avoid market glut of mature coconut or copra, but will also serve as a means to increased returns since tender coconut always fetches higher price. Harvesting of tender nuts at 6-7 month stage will also help in increased setting of inflorescences resulting in more than 12 bunches in a year thereby increasing productivity. Harvesting of Neera will also divert a portion of the production resulting in reduced arrival of mature nuts. Processing activities by farmer groups and farmer collectives, farmer industry collaboration in supply of raw material, backward support from industry through certification of farms and traceability mechanisms etc will take the sector to a progressive path.

As the saying goes, time and tide wait for no man and hence it is critical that farming and value addition move the sustainable way ensuring accessibility of nutritious food to all, managing natural resources and maintaining ecosystems to support current as well as future human needs. This will definitely lead to livelihood security and equitable access to resources.

Chairman,
Editorial Board

Sushri. Shobha Karandlaje calls for promotion of agribusiness and export in the coconut sector

Sushri. Shobha Karandlaje, Hon'ble Minister of State for Agriculture and Farmers Welfare, Government of India, called for the need to undertake coconut cultivation and processing as a commercial enterprise and target the export market to ensure remunerative returns to the small holder farmers. She was delivering the inaugural address of the 25th World Coconut Day celebrations organized by Coconut Development Board in association with ICAR-CPCRI, Kasaragod, on 2nd September 2023 at ICAR-CPCRI, Kasaragod. She urged the entrepreneurs to double their exports by sending coconut value-added products to consumers both in local market and export markets.

The Hon' ble Minister further called upon the farmers to make use of various developmental schemes of Government of India like Kisan Samman Yojana, PM Fasal Bheema Yojana, Agricultural Infrastructure Fund and various other schemes to improve production, value addition and export oriented trade.

She highlighted the need to move to processing and product diversification thus enabling a shift from copra centered processing to other products like neera, virgin coconut oil and coconut chips to delink coconut price from that of copra.

The Farmer Producer Organizations are capable of revolutionizing the coconut sector by strengthening the collective power of the small and marginal farmers. They can help promote farm mechanization, undertaking agriculture as a business and export promotion, she added.

District-wise Custom Hiring Centres have been started all over the country, she said and she cautioned the farmers against the usage of fake seeds. She welcomed the ICAR-CPCRI initiative on quality assured QR coded seedlings, which can help tracing the seedling details.

The Farmer Producer Organizations (FPOs) can do many things in farm mechanization including application of drones with an aim to reduce cost

of production. FPOs can avail incentives to set up Custom Hiring Center so as to cater to the need of small and marginal farmers.

The budget allocation for agriculture has increased more than four times since 2014 and has reached Rs. 25,000 crore. Similarly the Minimum Support Price of copra has doubled. Despite this, it is proven now that supply of more copra into the market will lead to price crash.

Shri. N A Nellikunnu, MLA of Kasargode who presided over the meeting appreciated the works of CPCRI and CDB and called for all institutions to work together towards the development of the sector through research initiatives for reducing cost of cultivation and ensure production of quality fertilizers.

Dr. VB Patel, Assistant Director General (F&PC), ICAR, New Delhi in his address said that the stakeholders together can take coconut to higher levels. A database on carbon sequestration can be converted to a carbon trading model to estimate environmental impact. He congratulated CPCRI for the generation of the highest number of technologies. Shri. Renukumar, Vice Chairman, CDB and Shri. P R Muralidharan, President, BAMCO offered felicitations.

Dr. B. Hebbar, Director, ICAR-CPCRI welcomed the dignitaries and briefed about various technologies developed by the Institute. He further informed that the research of CPCRI is reoriented to reduce the cost of cultivation and for climate change resilience. Dr. Hanumanthe Gowda, CCDO briefed about various schemes and programmes implemented for coconut farmers by Coconut Development Board. Various publications viz, Cultivation practices of coconut - North East India, Advisory on integrated management of leaf spot disease in arecanut in English and Malayalam, Ready Reckoner on Cocoa, Coconut and Arecanut (bilingual in English & Kannada), Coconut Products by Coconut Development Board in English & Hindi and Schemes for prosperity by Coconut Development Board were released during the occasion. An app on QR code development for seedlings was also executed by the Hon'ble minister. The Minister honoured ten coconut entrepreneurs in the function, MoUs on technology transfer were executed with seven entrepreneurs in the presence of Minister. Vadakara Coconut Farmer Producer Company Ltd, who secured the award instituted by the International Coconut Community for the best Farmer Organization globally was also felicitated at the event. Smt. Deepthi Nair S Director, CDB proposed vote of thanks.

Earlier the minister visited research laboratories of CPCRI including tissue culture and the agro processing laboratory. The Minister also witnessed drone based spraying on coconut plantation, ground pollination device demonstration, organic farming technology and integrated pest and disease management practices adopted by CPCRI.

More than 500 progressive farmers from the states of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Goa and Gujarat attended the programme. An exhibition was also organized showcasing various technologies on coconut cultivation and processing and diversified coconut products. Around 25 institutions/entrepreneurs/FPOs participated in the exhibition. A technical session was also organized followed by a panel discussion on coconut business plans proposed by the FPOs.


ICAR-Central Plantation Crops Research Institute, Kasaragod, Kerala
Coconut Development Board, Kochi, Kerala
विश्व नारियल दिवस
WORLD COCONUT DAY
FPO Business Meet
DST-SERB Karyashala
2 September 2023
Technical Sessions
Exhibition
CPCRI


विश्व नारियल दिवस


WORLD COCONUT DAY


ഉത്പന്നം ലോകവിപണിയിലെത്തിക്കാൻ
സംരംഭകർ ശ്രമിക്കണം -കേന്ദ്രസഹമന്ത്രി


Vijayavani
ಜಾಗತಿಕ ಮಾರುಕಟ್ಟೆಯಲ್ಲಿ ಮೌಲ್ಯವರ್ಧಿತ ಉತ್ಪನ್ನಗಳಿಗೆ ಬೇಡಿಕೆ


Vijayakarnataka
ತೆಂಗಿನ ಮೌಲ್ಯವರ್ಧಿತ ಉತ್ಪನ್ನಗಳ ರಫ್ತಿಗೆ ಆದ್ಯತೆ ಇರಲಿ


ಮೌಲ್ಯವರ್ಧಿತ ಕೃಷಿ ಉತ್ಪನ್ನಗಳನ್ನು
ಜಾಗತಿಕ ಮಾರುಕಟ್ಟೆಗೆ ಪರಿಚಯಿಸಿ


Shobha urges entrepreneurs to double their exports
Union Minister Cautioned Farmers Against Fake Seeds


കൊപ്ര കൊണ്ടുമാത്രം
നിലനില്പില്ല: കേന്ദ്ര മന്ത്രി


സി.പി.സി.ആർ.ഐയിൽ ലോക നാളികേര ദിനാഘോഷം


ವಿಶ್ವ ನಾರಿಕೇಳ ದಿವಸ


Mangalam


Hosadigantha
ಕೃಷಿ ಕ್ಷೇತ್ರದ ಅಭಿವೃದ್ಧಿ ಕೇಂದ್ರದ ಧ್ಯೇಯ


தினகரன் 04.09.2023
தஞ்சாவூர் மாவட்ட செய்தி
ப.எண். 15


மௌல்யவர்தித கிருஷி உத்பன்னகளன்னு
ஜாகதிக மாருகட்டெகே பரிசயிஸி
ವಿಶ್ವತೆಂಗು ಬೆಳೆಗಾರರ ದಿನದಲ್ಲಿ ಜೀವೆ ತೋಭಾ ಕರಂದಾಜೆ


லோக நாளிகேர தினம் உத்஘ாடனம் செய்து


Deccan Herald
Double exports on value-added coconut products: Shobha


Karavel


Shobha urges entrepreneurs to double their exports
Union Minister Cautioned Farmers Against Fake Seeds


Hosadigantha
ಕೃಷಿ ಕ್ಷೇತ್ರದ ಅಭಿವೃದ್ಧಿ ಕೇಂದ್ರದ ಧ್ಯೇಯ


നാളികേരത്തിന്റെ നാട്ടിൽ തെങ്ങുകർഷകയായി കേന്ദ്രമന്ത്രി


കർഷകരുടെ കാര്യത്തിൽ കേരളം കേന്ദ്രത്തെ
അനാവശ്യമായി കുറ്റപ്പെടുത്തുന്നു: ശോഭ കരന്തലജെ


Suprabhatam
ലോക നാളികേര ദിനാഘോഷത്തിന്
കാസർകോട് സി.പി.സി.ആർ.ഐയിൽ തുടക്കം
മൂല്യവർധിത ഉൽപന്നങ്ങൾക്ക്
പ്രാധാന്യം നൽകണം: കേന്ദ്രമന്ത്രി

സിപിസിആർഐയിൽ ലോക
നാളികേര ദിനാഘോഷം നടത്തി

CDB unit Offices Celebrated World Coconut Day across the country

CDB Regional Office Chennai

CDB Regional Office, Chennai in association with Tamil Nadu Agricultural University and Department of Agriculture and Farmers Welfare, Government of Tamil Nadu organized World Coconut Day at Agriculture College & Research Institute, TNAU, Eachangkottai, Thanjavur District. More than 300 coconut farmers and entrepreneurs from Thanjavur, Pudukkottai, Trichy and Dindigul districts attended the programme.

Shri. E. Aravazhi, Director, CDB, Regional Office, Chennai briefed on the Current global and national Scenario of coconut. Shri. R. Elango, Member, Coconut Development Board; Dr. A. Velayutham, Dean, Agriculture College & Research Institute, TNAU, Eachangkottai; Shri. N. K. Nallamuthu Raja, Joint Director of Agriculture, Department of Agriculture Farmers Welfare, Thanjavur Dr. N. Venkatachalapathy, Dean Research, NIFTEM, Thanjavur. and Shri. S. Eswar, Deputy Director of Agriculture, Department of Agriculture Farmers Welfare, Thanjalur spoke during the occasion. A technical session and an exhibition of coconut products was also held as part of the programme.

CDB Regional Office Bangalore

Coconut Development Board, Regional office, Bangalore and DSP farm, Mandya jointly organized the World Coconut Day celebration-2023 in association with Atmalingeshwara, Bharatinagara and Malai Mahadeswara Swamy Coconut Producers Federations and Horticulture Department on 2nd September 2023, at Kuvempu Sabhangana, Bharati College, K. Maddur. Mrs. Roopashree K. N., Deputy Director of Horticulture, Mandya; Dr. Siddappa R, Assistant Professor, Dept. of Spices, Plantation, Medicinal and Aromatic crops, College of Horticulture, Mysore; Dr. G. Manjunath, Associate Professor, Dept of Plant Pathology, College of Horticulture, Mysore; Dr. Mutturaj G. P, Assistant Professor, Dept. of Entomology, College of Horticulture, Mysore and other dignitaries were present at the World Coconut Day Celebration. Shri. Jayanath R, Deputy Director, CDB, RO, Bengaluru delivered the welcome address.

Shri. Madhu G. Madhegowda, President of Atmalingeshwara CPF, presided over the programme and Shri. B. M. Nanjegowda President of Bharatinagara CPF inaugurated the programme and Shri. K. Lingegowda, President of the Malai Mahadeswara Swamy CPF attended the programme.

A technical session was also organized as part of the function. Dr. Siddappa R, Assistant Professor, Dept. of Spices, Plantation, Medicinal and Aromatic crops, College of Horticulture, Mysore; Dr. G. Manjunath, Associate Professor, Dept of Plant Pathology, College of Horticulture, Mysore and Dr. Mutturaj G. P, Assistant Professor, Dept. of Entomology, College

of Horticulture, Mysore addressed the farmers and answered their queries regarding scientific management in coconut gardens, major pest and diseases in coconut and its management. More than 500 progressive farmers attended the programme. Coconut seedlings were distributed to the farmers who attended the function. An exhibition was also organized to display various value added products, coconut handicrafts and publications

CDB Regional Office Guwahati

Coconut Development Board, Regional Office, Guwahati celebrated World Coconut Day on 2nd September 2023 at Momai Tamuli Auditorium Hall, Directorate of Horticulture and Food Processing, Khanapara, Guwahati. Shri Subrata Roy Bardhan, Secretary to the Govt. Of Assam, Department of Agriculture was the Chief Guest and inaugurated the programme. Dr. Govindaswamy Kadirvel, Director of ICAR-ATARI; Commodore Rajiv, Ashok, Managing Director, NERAMAC, Guwahati; Shri Nabin Kumar Roy, General Manager, NABARD and other dignitaries were present during the programme.

Dr. Rajat Kumar Pal, Director, Coconut Development Board, Regional Office, Guwahati delivered the welcome address. Dr. Govindaswamy Kadirvel, Director of ICAR-ATARI, Kahikuchi, Guwahati, Shri Nabin Kumar Roy, General Manager, NABARD, Commodore Rajiv Ashok, Managing Director, NERAMAC, Guwahati, Dr. Dhirendra Nath Kalita, Principal Scientist and Head, Krishi Vigyan Kendra, Kamrup, Smt. Madhusmita Deka, Community Science, Krishi Vigyan Kendra, Kamrup, Dr. D. N. Kalita, Principal Scientist and Head, KVK, Guwahati Madhusmita Deka, Community Science, KVK, Kamrup spoke during the occasion. Around 135 Farmers, entrepreneurs, VIPs, dignitaries, officers of Directorate of Horticulture, and officers of other departments were present in the programme.

CDB Regional Office, Patna

CDB RO Patna celebrated World Coconut Day at Sumrath Kendra, Badgaon, Gaya on 2nd September 2023. Dr. Ashok Kumar, Sr. Scientist/SMS, KVK, Manpur, Gaya, Shri, Prabhu Rajak, Mukhiya, Simwara Panchayat, Smt. Surabhi, Director, M/s Takari Agro Producer Company Ltd., Sumrath Kendra, Gaya, Smt. Siyamani Devi, Sarpanch, Badgaon, Gaya, Shri. Rajeev Bhushan Prasad, Director, CDB, Patna and other dignitaries attended the programme.

Dr. Ashok Kumar, Sr. Scientist/SMS, KVK, Manpur, Gaya delivered the welcome speech. Dr. Rajeev Bhushan Prasad, Director, CDB, RO, Patna spoke on the theme, 'Sustaining Coconut Sector for the present and future generation' and also on the various schemes and programmes being implemented by the Board. Around 100 farmers participated in the Programme.

CDB State Centre, Andaman and Nicobar Islands

Coconut Development Board, State Centre, Port Blair in association with State Agriculture Department A & N Administration celebrated World Coconut Day on 2nd September, 2023 in the Conference Hall of the office of Assistant Director (Agriculture), South Andaman, Andaman & Nicobar Administration. The programme was attended by around 70 persons including farmers, entrepreneurs and officials of CDB and agriculture Department.

Dr. Y. Ramakrishna, Principal Scientist and Head of Krishi Vigyan Kendra (KVK), Sippighat, ICAR-CIARI,

Port Blair was the chief guest of the programme. Shri Ramesh Kumar, Joint Director, Agriculture Department, Smt. S. C. Rekha, Assistant Director, Agriculture Department and Shri Hassan, Assistant Director, High Value Agriculture Department Agency, Agriculture Department were the other dignitaries who were present during the occasion. A Technical Session was also held as part of the programme.

CDB State Centre, Odisha

Coconut Development Board, State Centre, Odisha in association with the KVK-Puri conducted World coconut Day, 2023 on 2nd September 2023 at Krishi Vigyan Kendra, Puri, Odisha. Dr. Suryakanta Mishra, Sr. Scientist & Head, KVK-Puri inaugurated the Programme. Dr. Ajit Kumar Sahoo, Asst. Professor (Horticulture), OIC, AICRP on Palms, welcomed the gathering.

Dr. Sumita Acharya, Scientist (Home Science) discussed with the famers on value addition in Coconut and Dr. Ajit Kumar Sahoo, Asst. Professor (Horticulture), OIC, AICRP on Palms spoke on "Scientific coconut cultivation technology. Dr. Bishnupada Giri, Scientist (Horticulture), and Shri Amar Kumar Shrivastava, SFO, Coconut Development Board spoke during the occasion.

CDB State Centre, West Bengal

Coconut Development Board, State Centre, Kolkata organized World Coconut Day celebration on 2nd September 2023 at RK Mission Loka Siksha Parishad, Narendrapur, Kolkata by organizing a District Level Seminar on Coconut Production Technologies and Value Addition on coconut. Around 100 participants from different blocks of South 24 Parganas, Nadia, Purba Medinipur, North 24 Parganas and Howrah districts attended the Seminar. Swami Vasabananda Ji Maharaj presided over the programme and Shri. Jayanta Kumar Aikat IAS, Director of Horticulture (Technical), Department of FPI & Horticulture, Government of West Bengal inaugurated the programme. Dr. Amiya Debnath, Deputy Director, CDB briefed about various schemes and programmes.

CDB State Centre, Vijayawada and DSP Farm, Vegiwada

Coconut Development Board, State Centre, Vijayawada and DSP Farm, Vegiwada jointly celebrated the World Coconut Day 2023, on the theme Sustaining coconut sector for the present and future generation' on 2nd September 2023 at Krishi Vigyan Kendra - Pandirimamidi, Andhra Pradesh.

Shri Shubham Bansal, IAS, Joint Collector, ASR district inaugurated the programme and appealed the farmers to go for coconut cultivation with the suggestions of the experts of University, State Horticulture Dept. and CDB in accordance with the suitability to the climate and altitude. Around 200 participants attended the programme organised in the Integrated Tribal Development Agency area of Rampachodavaram.

Dr. K Rajendra Prasad, Principal Scientist (Hort.) & Head, Dr. YSRHU-HRS, Pandirimamidi; Dr. NBV Chalapathi Rao, Principal Scientist (Ento.) & Head, Dr. YSRHU-HRS, Ambajipeta; Dr. PC Vengaiah, Senior scientist (Food Sci. & Tech.), Dr. YSRHU-HRS, Pandirimamidi, Dr. Lalitha Kameswari, Senior Scientist & Head, Dr. YSRHU-KVK, Pandirimamidi; Shri Chittibabu, Project Horticultural Officer, Rampachodavaram; and Shri Vallu Gopi Raju, Technical Officer, CDB spoke during the technical session.

Shri Johar Khan, Chairman, Chicof CPC; Shri Verma, Sri Ramakirshna CPC, Shri Tandon Raju,

Mahima CPC and Shri Sivaramakrishna, Chaitanya CPC attended the programme and shared their experiences. Coconut planting method and use of palm climbing device was also demonstrated for the farmers. Two seedlings each was distributed to the participant farmers. The programme was started with welcome and introductory address by Shri Kumaravel S, Deputy Director i/c, CDB, Vijayawada.

CDB State Centre, Thane and DSP Farm Palghar

Coconut Development Board, State Centre Thane and DSP Farm Palghar celebrated World Coconut Day on 5th September-2023 at Ganpati Samaj Mandir Hall, Chaul in association with Department of Agriculture, Govt. of Maharashtra and Krushak Kalyankari Sanstha Chaul, Alibag District Raigad.

Smt. Ujwala Bankhele, District Superintendent Agriculture Officer,Department of Agriculture, Government of Maharashtra, Alibag District Raigad inaugurated the programme in the presence of Shri. Kailash Wankhede, Sub Divisional Agriculture Officer,

Alibag, Shri. Ravindra Patil Chairman, Krushak Kalyankari Santha Chaul, Shri. Ravindra Kumar, Deputy Director In charge, Coconut Development Board, State Centre, Thane, Shri.Hemant Gursale, Chief Manager, Rashriya Chemical Fertilizer Ltd Thal, Dr. Vaibhav Shinde, Associate Professor Dr.Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Smt. Manisha Mahendra Dalvi, Member of Zilha Parishad, Raigad, Shri.Pankaj Sakhare, Taluka Co-ordinator, Agriculture Insurance Company, Mumbai, Shri. Indranel Chauhan, Director, Bharat Agro Ltd, Kolhapur, Shri. Subhash Bainakhe, Taluka Agriculture Officer, Alibag and Shri. Sharad S. Aglawe, Senior Field Officer, CDB, DSP Farm, Palghar were present during the occasion.

A Technical Session was also organized with World coconut day celebration 2023 in which Dr. Vaibhav Shinde, Associate Professor, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri, Maharashtra spoke on Scientific Coconut Cultivation Technology in Maharashtra. Shri. Sharad S. Aglawe, Senior Field Officer, CDB, DSP Farm, Palghar briefed on Coconut Development Board Schemes. A cookery competition was also organised.

DSP Farm, Neriamangalam

CDB, DSP Farm, Neriamangalam celebrated World coconut day on 2nd September 2023. Smt. Susan lee Thomas Superintendent, District Agriculture Farm Neriamangalam inaugurated the programme. Smt. Mini Mathew, Assistant Director, CDB spoke on the importance of World Coconut Day celebrations and Programmes of CDB during the occasion and Shri. Arun Paul, Agricultural Officer, Krishi Bhavan, Choornikkara, spoke on pest and disease management of coconut. Shri. Sunil Syriac, Poonatt, CEO, Kothamangalam CPC shared FPO experiences. Shri. Babu Varkey, Assistant Director i/c CDB, DSP Farm, Neriamangalam deliverd the welcome address Smt Janisha K.P and Shri. Shaji C.S Field Officers CDB DSP Farm, Neriamangalam briefed on Coconut Nursery Management and field Demonstration of D x T Production respectively. Shri. James Thodupuzha, FPO representative shared his experiences in

production of Neera and Shri Shamsudheen S.S shared Hybridization training experiences.

DSP Farm Dhali, Tamilnadu

Coconut Development Board, Centre of Excellence for Coconut, DSP Farm, Dhali conducted World Coconut Day on the theme “Sustaining Coconut Sector for Present and Future Generation” for the benefit of the coconut farmers of Tirupur and Coimbatore Districts in Tamil Nadu. Shri K. Shanmugasundaram, Hon’ble Member of Parliament, Pollachi constituency delivered the inaugural address and on behalf of Tirupur District Collector T. Christuraj, IAS, Shri Jaswanth Kannan, Revenue Divisional Officer, Udumalpet presided over the programme. Dr. K. Rajamanickam, Adjunct Professor (Coconut), DoDL, TNAU, Coimbatore and CDB Member (Research & Development) and Shri M. Mariappan, JDA of Triupur District spoke

during the occasion. Shri G. Ragothuman, Farm Manager welcomed the gathering .A technical bulletin on "Coconut Cultivation Technologies"was released during the occasion. A quiz competition was also conducted at Government High School, Thirumoorthi Nagar and prizes were distributed by Shri K. Shanmugasundaram, Hon'ble Member of Parliament, Pollachi Constituency to the students. A technical session and exhibition was also held as part of the programme.

DSP Farm, Madhepura

WCD was celebrated at the premises of DSP Farm, Madhepura, Bihar on 2nd September 2023. Shri Bilich Dan Bara, Assistant Director, CDB presided over and Dr. Surendra Chaurasia, Sr. Scientist and i/c, KVK, Madhepura was the chief guest of the function and

in his address he spoke about the various aspects of coconut farming and coconut industry and income obtained from the production and value addition of coconut. Shri Rahul Kumar, Horticulture specialist, KVK, Madhepura and Shri Ram Nivas Singh, Sr, Field Officer, CDB also spoke during the occasion. A technical session was also held and farmer's queries were answered by the experts.

Directorate of Agriculture Goa celebrated World Coconut Day

The Directorate of Agriculture, Goa in association with Coconut Development Board, SAMETI and Agricultural Technology Management Agency (North) and KVK (South-Goa) celebrated world coconut day on 5th September 2023. Shri. Nevil Alphonso, Director of Agriculture inaugurated the programme. Shri. Anant Homble, Deputy Director, SAMETI, Shri. Kishore Bhave, Project Director, ATMA, and Shri. Chandrahas Dessai, Managing Director, Goa State Horticulture Corporation were the Guests of Honur. Coconut Development Board was represented by Shri. Sharathkumar G, Technical Officer. A technical session was also held as part of the programme.

Aahar 2023, Food & Hospitality Fair

Coconut Development Board, Regional Office, Chennai participated in Aahar 2023, Food & Hospitality Fair held during 15th to 17th September 2023 at Chennai Trade Centre, Nandambakkam, Chennai organized by India Trade Promotion Organisation & Tamil Nadu Trade Promotion Organisation. M/s. Vinayaga, Anamalai and Global CPCs, M/s. Koppra Pvt., Ltd., and M/s. Sakthi Coco Pvt., Ltd., from Tamil Nadu exhibited their products like Neera, Coconut Milk, Virgin Coconut Oil, Coconut Oil, Tender Coconut Water, Neera & Coconut sugar, Coconut Chips, Flavoured Coco Nata and Shell based handicrafts etc in the Board's stall. Farmers, students, entrepreneurs, from various districts of Tamil Nadu and other states visited CDB stall and collected information related to coconut cultivation, varieties, nursery, value addition, and Board schemes. They also enquired about the export details of coconut based products. CDB officials briefed on Boards schemes and programmes to the visitors.

Let's identify Coried bug of Coconut, How it can be controlled

Sunny Thomas, Abdul Harris, Joseph Rajkumar,
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Introduction

The Coried Bug, scientifically known as *Paradasynus rostratus*, is a destructive pest that poses a significant threat to coconut plantations in various regions of Kerala, particularly in the southern districts of Thiruvananthapuram, Kollam, and Alappuzha. This pest belongs to the Corridae family and is a sucking pest and primarily feeds on tender nuts, causing severe damage to yield of the coconut palms. The infestation of the Coried Bug results in the shedding of buttons, leading to substantial yield losses. Affected bunches may become empty or fail to bear fruit, while mature nuts exhibit cracks and pits in their husks as a consequence of the pest's attack. The presence of eye- shaped spots serves as a characteristic indication of this infestation. Regrettably, many farmers remain unaware that these bugs are responsible for this problem, often expressing concerns about fruitless or prematurely falling bunches.

Furthermore, besides coconuts, the Coried Bug also targets other plants such as guava, tamarind, and buds of the neem plants. This article discusses, the impact of the Coried Bug on coconut palms and effective measures for its control and management.

Life Cycle

The life cycle of the chocolate brown bug, known as the Coried, begins with the female laying 30 to 55 eggs at a time in a beautiful pattern. The eggs are laid in inconspicuous places, including areas such as Coconut's Spathe, Rachils, Petioles, and Immature nuts. In some cases, they have been observed laying eggs on windowsills of houses. The eggs, which are pale yellow in colour, hatch within 10 days, and their colour turns red during hatching. The newly hatched nymphs are often mistaken for red ants. As they progress through the first and second stages of growth they can be found in groups. After around 30 days, the mature nymphs started to suck juice of nuts. At this stage, their colour changes to reddish black.

The nymphs reach their full growth in 30 days and then climb onto newly opened inflorescences to drink the sap of buttons. They also commonly attack unpollinate/pollinated nuts up to 3 months old. Their feeding causes the fruits to drop off or wither, remaining on the bunches. They primarily target soft female flowers and other small nuts that have not completed pollination. After the season or not, it is unclear where this pest resides or not.

Attack Symptoms:

The adult and pre-adulted stages of the coried bugs target coconut buttons and sucking sap just through the calyx (modam) using their needle-like proboscis. These pests puncture and feed on the plant tissue, resulting in visible puncture marks. As the infestation progresses, fruit drop occurs at an accelerated rate. The coried attacks the nuts in three portions specifically top,middle and bottom of nuts.

However, if the infestation is limited to the middle and lower part of the pods, the fruits may not fall and remain as a malformed nut. When the coried bug feeds, it injects a certain type of toxin into the fruit tissue. This causes the affected area to turn brown, become scaly, and develop wrinkles. To observe these symptoms, one can remove the fallen cap- like parts of the buttons. It is also common for infested nuts to contain a dry, sticky brownish liquid, often referred to as "Kakkaponnu" due to its shiny appearance. In some coconut trees, the coried bug infestation can persist for multiple years, necessitating careful control measures. Affected coconuts tend to be smaller, resulting in reduced copra size, as the infested panicles fail to grow properly upon ripening. Consequently, quantity suffers and the production of coconut oil decreases. Additionally, the tough husks of infested coconuts are unsuitable for fibre production. In certain cases, even if the fruits are attacked, surface cracks or pits may not be visible. Instead, inwardly wrinkled areas can be observed, often accompanied by black spots. The severity of coried bug infestations typically intensifies after intermittent rains in May and June, as well as during the rainy season from September to December. In some instances, the infestation may persist until January.

Control Methods

Various natural predators and parasites have been discovered to effectively combat the infestation of the coconut-attacking bug known as the coried. One such method employed by farmers is the utilization of ants, commonly referred to as 'neer,' to eradicate the coried nymphs. Insect control requires thorough cleaning of the crowns of trees by removing all the

dry branches, spathes etc. However, in cases of severe infestation, the application of insecticides becomes necessary.

Studies conducted by CPCRI (Central Plantation Crops Research Institute), Kayamkulam have demonstrated the efficacy of two control measures for effectively managing coried infestation in coconut trees. The first method involves the use of Azadirachtin-based bio-pesticide (nimbicidin), applied at a concentration of 13 ml per liter of water. The second method employs the use of Thiamethoxam (25% Wettable Granule) 2 gm (uno), mixed with 10 liters of water, to treat the bunches. It is crucial to spray all parts of the plant, including unopened bunches based on severity of attack. *Lamdachyalothrin* (5% w/w) is another effective chemical which can be sprayed @ 1 ml/litre of water. Insecticides rotation is requested for effective control of the pest.

It is advisable to adhere strictly to the recommended fertilizer application rates. By adopting these aforementioned methods, coconut farmers can effectively protect their trees from the detrimental impact of the blossom borer.

Biotic barriers of coconut and its management

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Coconut (*Cocos nucifera Linn.*) is an important plantation and perennial oil seed crop of India. It is called Kalpavriksha or Tree of Heaven or tree of Abundance, because each and every part of the coconut is useful to human being. Coconut farming offers livelihood security to millions of people across India and it provides improved nutrition, employment and income generation as well. Though coconut palm is hardy in nature and adaptable to varied climatic conditions, it is affected by many diseases at various phases of its growth starting from seedlings to bearing stage. Diagnostic symptoms of coconut diseases and their management strategies are detailed below.

1.Bud rot

The bud rot was first reported in India by Butler in 1906.

Causal organism - *Phytophthora palmivora*

Symptoms

Palms of all ages are susceptible to the disease, but it is more severe in young palms up to 10 years. The symptoms initiated on the central shoot (spindle) of the tree. The heart leaf becomes brown or black instead of yellowish brown followed by drooping and breading off the heart leaf. The affected internal tissues of the spindle leaf show rotting and emit foul smell. The central shoot comes off easily on slight pulling as the basal portion is dead.

Bud rot symptom

Favourable conditions

High rainfall, humidity (above 90%), low temperature (18-20°C) (November to January months) are highly favorable for the development of the disease.

Management

- The infected tissues (crown) should be removed and cleaned
- The crown should be poured with 1% Bordeaux mixture or 0.25% copper oxychloride
- Application of 50 g each of *Bacillus subtilis* and *Trichoderma viride* along with 10 kg of farm yard manure per palm at six months interval

2.Grey leaf spot

The disease was first reported in British Guyana.

Causal organism - *Pestalotia palmarum*

Symptoms

Symptoms develop on the outer whorl of leaves, especially in older leaves. Minute yellow spots surrounded by a greyish margin appear on the leaflets. Gradually, the centre of the spots turns to greyish white with dark brown margins with a yellow halo. Many spots coalesce into irregular grey necrotic patches. Large number of globose or ovoid black acervuli appear on the upper surface of leaves.

Grey leaf spot

Favourable conditions

Ill drained soils, soils with potash deficiency, continuous rainy weather for 4-5 days and strong winds

Management

- Removing and burning of the infected and fallen leaves periodically
- Improving the drainage conditions of the soil
- Application of potash 3.5 kg per palm per year
- Application of *Bacillus subtilis* @ 200g along with 50kg of decomposed FYM per palm per year
- Application of 5 kg of neem cake per palm per year
- Spraying Copper oxychloride @ 0.25% or Bordeaux mixture 1% before onset of the rainy season

3.Leaf Blight

Leaf blight was first reported in India. Palms more than 15 years old are highly susceptible to this disease. It causes yield loss up to 25 per cent in advanced stages of infection. The disease is severe during summer months.

Causal organism - *Lasiodiplodia theobromae*

Symptoms

Leaf blight causes serious damage in seedlings, leaves and nuts of adult palms. Generally the adult leaves in the outer whorls are affected. The affected leaflets start drying from the tip downwards and exhibit a charred or burnt appearance. Dark grey to brown lesions with wavy to undulated margins appear from the apex of the nuts. The fungus entered in to the kernel through mesocarp, resulting in the decay of the endosperm. The affected nuts were desiccated, shrunken, deformed and dropped prematurely.

Leaf blight Favourable conditions

The disease is noticed throughout the year and the maximum incidence is observed during summer months.

Management

- Removal and burning of the severely affected leaves in the lower most leaf whorls to avoid further spread
- Spraying of 1% Bordeaux mixture or 0.25% copper oxychloride two times at 30 days interval (or)
- Root feeding with carbendazim 2 g or hexaconazole 2 ml in 100 ml water three times at three months intervals
- Application of 200g Bacillus subtilis along with 50 kg of FYM
- Application of 5 kg of neem cake per palm per year
- Application of an additional quantity of 1.5 kg of potash over and above the normal recommendation of 2 kg per palm per year

4.Stem bleeding

The disease was first reported in Sri Lanka. In the early stage of infection, there is not much yield loss. However, in later stages, there is a steady yield decline causing considerable loss and in advanced stages even death of affected palms occurs. The disease occurs in all soil types, but more in laterite and sandy soils.

Causal organism - *Theilaviopsis paradoxa* (*Ceratocystis paradoxa*)

Symptoms

The characteristic symptom is the exudation of reddish brown fluid from the cracks in base of the stem bark and form irregular streaks of exudation. In course of time, this progresses upwards to several feet on the stem and the exudates dry up forming a black crust. The tissues below the cracks turn yellow and decay. The exudates eventually dry up to form black encrustations with dark brownish orange margin. Cavities are formed in the palm from which liquid comes out, when the bark is pushed or punctured. In advanced stage of infection, the trees may become barren and die.

Stem bleeding Favourable conditions

Copious irrigation or rainfall followed by drought, shallow loamy soils or laterite soil with clay or rock layer beneath the soil and damages by Diocalandra and Xyleborus weevils.

Management

- Removal and destruction of the severely affected dead palms

- Application of 50 kg FYM and 5 kg neem cake per palm per year
- Application of 50 g of *Bacillus subtilis* and 50 g of *Trichoderma viride* along with 10 kg of farm yard manure per palm
- The infected portion should be treated with Bordeaux paste or Trichoderma paste
- Root feeding with hexaconazole 2ml in 100 ml of water for three time at 3 months interval

5.Basal stem rot /Thanjavur wilt

Ganoderma wilt or Basal stem rot or Thanjavur wilt is a very important destructive disease in coconut. In Tamil Nadu, this disease was first observed in Thanjavur district in 1903.

Causal organism - *Ganoderma lucidum / G. aplanatum*

Symptoms

The trees in the age group of 10-30 years are easily infected by the pathogen. Symptoms are yellowing, withering and drooping of the outer fronds which remain hanging around the trunk for several months before shedding. More often the spindle is blown off leaving the decapitated stem. The wilted plants also show bleeding patches near the base of the trunk. A brown gummy liquid oozes out from the cracks in the tree which slowly result in the death of outer tissues. Numerous tiny holes made by Xyleborus weevil (secondary invader) are seen on the trunk all along the bleeding patches. In advanced stages of infection, the fungus produces fruiting body (Bracket) at the basal portion of the trunk.

Basal stem rot Favourable conditions

Sandy loam and sandy soils, water logging during severe rains, low soil moisture content during summer months and damages caused by weevils and beetles.

Management

- Removal and destruction of severely affected dead palms
- Irrigation water should be restricted from the infected palm to healthy palms by forming isolation trenches around the infected palms
- Soil drenching of 1% Bordeaux mixture @ 40 litres per palm
- Root feeding of hexaconazole 2ml in 100 ml of water thrice at 3 months interval
- Intercropping with banana reduced the severity of the disease
- Application of *Bacillus subtilis* and *Trichoderma viride* @ 100g each along with 50 kg FYM and 5 kg neem cake per palm per year

6. Leaf Rot Disease

It is a complex of fungal disease which occurs on root (wilt) affected palms

Causal organism - *Colletotrichum gloeosporioides, Exserohilum rostratum, Fusarium spp*

Symptoms

Appearance of water-soaked brown lesions in the spear leaves of root-wilt affected palms. Gradually these spots enlarge and coalesce resulting in extensive rotting. As the leaf unfurls, the rotten portions of the lamina dry and get blown off in wind, giving a "fan" shape to the leaves.

Leaf rot Management

- Removal of the rotten portions from the spear and the two adjacent leaves
- Pouring of fungicide solution of hexaconazole 2ml or mancozeb 3g in 300ml water per palm to the base of spindle leaf
- Spraying the crowns and leaves with 1% Bordeaux mixture

7. Root wilt disease (Kerala wilt)

In India, the coconut root (wilt) disease was first reported from Erattupetta of Kottayam district, Kerala and now spreads to Tamil Nadu also. In root (wilt) disease affected plantations the extent of decline in yield is proportional to the intensity of the disease and generally varied from 10 to 80 per cent.

Causal organism – Phytoplsama and transmitted by plant hopper (*Proutista moesta*) and lace wing bug (*Stephanitis typicus*)

Symptoms

Wilting and drooping of leaves, flaccidity (curved abnormally inwards, resembling the ribs of mammals), ribbing, yellowing and necrosis of leaflets are typical symptoms on foliage. The important diagnostic symptom is "flaccidity" of leaves. Yellowing of leaves, marginal necrosis of leaflets and rotting of roots occur. The crown size also gets reduced and trees remain unproductive.

Root (wilt) Management

- Removal of the infected palms yielding less than 10 nuts per year
- Application of balanced dose of chemical fertilizers (Urea – 1.3 kg; Super phosphate – 2.0 kg; Muriate of Potash – 3.5 kg; Magnesium sulphate – 1.0 kg per palm per year)
- Application of *Bacillus subtilis* and Trichoderma viride @ 100g each along with 50 kg FYM and 5 kg neem cake per palm per year
- Growing green manure crops viz., cowpea, sunhemp, *Calopogonium mucanoides, Pueraria phaseoloides*
- Irrigating properly in summer (250 litres/day) and also provide proper drainage
- Growing suitable inter and mixed crops (banana, pepper, cocoa, vanila, turmeric, ginger, pineapple, coffee, nutmeg, tapioca etc.)
- Spraying of Dimethoate @ 2 ml per litre of water with 1 ml Sandovit for the management of lace wing bugs and plant hoppers

World Coconut Day Celebration and National Teachers' Day - 2023
at ICAR-CPCRI, Regional Station, Kayamkulam

ICAR-CPCRI Regional Station, Kayamkulam incollaboration with Coconut Development Board, Kochi observed World Coconut Day celebrations and National Teachers' Day on 5th September 2023 with various activities including farmers' seminar, farmer-scientist interaction, felicitation to retired teachers from Kerala Agricultural University (KAU) and competitions for staff members. The theme of this year's World Coconut Day was 'Coconuts:Transforming Lives'. Dr. Regi Jacob Thomas, Principal Scientist, welcomed the gathering and briefed about importance and significance of both the events. The programme was inaugurated by Dr. C. K. Peethambaran, Retired Director of Research, KAU. Dr. P. Anithakumari, Acting Head, ICAR-CPCRI, RS, Kayamkulam was the chairperson of the session. Dr. A. Abdul Haris, Principal Scientist, led the interactive session with the farmers. Dr. C. K. Peethambaran, Dr. D. Alexander (Retired Director of Research, KAU), Dr. Sverup John (Retired Dean, Faculty of Agriculture, KAU), Dr. Shylaja S. (Retired Professor (Agricultural Extension), Dr. Arthur Jacob (Retired Associate Director of Research (Southern Region), Dr. A.V. Mathew (Retired Associate

Director of Research, RARS, Kumarakom) were the panelists of the technical session in farmers seminar. The retired teachers from KAU who nourished three generations of agriculture graduates were honored. 'Kalpasthupam', reminiscence for commemorating the legacy of 75 years of service to coconut farming community was unveiled during the event. Various competitions were organized for the staff members depicting the importance of coconut to the society. Sixty farmers, people representatives and officials of Department of Agriculture Development and Farmers Welfare from Thanneermukkom Panchayath participated in the programme. Dr. A. Joseph Rajkumar, Principal Scientist proposed vote of thanks.

Invasive rugose spiraling whitefly (RSW) in coconut plantations: Bio-intensive management

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East Coast Tall (ECT) plantation at SKPP Polytechnic College, Ramachandrapuram selected for evaluation of bio pesticides (2020-21).

East Coast Tall (ECT) plantation at SKPP Polytechnic College, Ramachandrapuram selected for evaluation of bio pesticides (2020-21).

Introduction

Coconut (*Cocos nucifera L.*) is one of the most important plantation crops in India and several South East Asian countries. India is the largest coconut producing country, and is the third largest country in area under coconut with 2,199 hectares under the crop. The annual production is up to 20,736 million nuts with a productivity of 9430 nuts/ha (ICC, 2021). However, the production and productivity of coconut palm is often limited by incidence of several pests and diseases (Chowdappa *et al.*, 2018 and Neeraja *et al.*, 2020). Exotic pests cause billions of dollars in damage and substantial ecological changes in native horticultural ecosystems (*Simberloff et al.*, 2013). Rugose spiraling whitefly (RSW), *Aleurodicus rugioperculatus Martin* (Hemiptera: Aleyrodidae) is highly polyphagous and invasive pest, reported for the first time in India during 2016 in Tamil Nadu on coconut plantations (Selvaraj *et al.*, 2016) which was later on identified from different coconut growing areas of India viz., Kerala, Karnataka and Andhra Pradesh.

Bio-pesticides based on plants and pathogenic microorganisms are particular to target insect pest which offer an ecologically sound and effective solution to pest problems (Gupta and Dikshit, 2010). Although, the chemical pesticides may be effective on crop pests, their long-term usage affects the natural enemy population, resistance development in pests and environmental pollution. The entomopathogenic fungus, *Isaria fumosorosea* was found effective mainly against whiteflies (Luangsa-Ard *et al.*, 2005) and the fungus was used as potential biocontrol agent against RSW under natural field conditions in Florida (USA) (Kumar *et al.*,2018). To achieve long-term pest suppression of RSW in a sustainable manner, bio-control agents like, entomo-fungal pathogens and botanical pesticides were evaluated against the invasive RSW under field conditions. The benefits of bio-pesticides would reduce load of synthetic insecticides, delayed onset of resistance in the pest populations and safer habitat for natural enemies and pollinators (Ali *et al.*, 2015).

Field Evaluation of Bio pesticides against rugose spiraling whitefly (RSW)

Field efficacy of various bio-pesticides was evaluated against RSW in East Coast Tall (ECT) variety of 7 years age-old palms with medium RSW incidence

High Jet Sprayer

Spraying of Biopesticides

(10-20 spirals per leaflet) as per the damage rating scale developed by Srinivasan *et al.*, (2016) during December, 2020 to February, 2021 and December, 2021 to February, 2022 at Dr. YSR HU - SKPP Polytechnic college, Ramachandrapuram (16°83'72"NL and 82°03'25" EL) and Dr. YSR HU - HRS, Ambajipeta (16°59'38"NL and 81°95'36" EL). Evaluation of bio pesticides was undertaken at Ramachandrapuram, horticultural polytechnic college working under the aegis of Dr. YSR Horticultural University during 2020-21.

The entomo-fungal pathogens were applied through foliar sprays of talc formulations at the dose of 0.5 per cent during December to February (four rounds) at 15 days intervals (T1, T2, T3 and T4). Azadiracthin 10,000 ppm (T5) at the concentration (0.1 per cent) and Soapnut powder at 0.3 per cent (T6) were sprayed similarly. Jet water spray was also given as a treatment. Every treatment is replicated thrice with two palms in each replication. Untreated palms were considered as control treatments. Spray fluid of 5-10 l per palm were used based on canopy of the palm.

East Coast Tall (ECT) plantation at HRS, Ambajipeta selected for evaluation of bio pesticides (2021-22)

High Jet Sprayer Spraying of Biopesticides

The observations on RSW incidence were made at weekly intervals starting from 7 days after imposing the treatments and continued up to 28 days. The data concerning number of RSW nymphs and adults were recorded on four randomly selected infested leaflets per frond per palm from the top, middle and lower whorl representing four directions (total of 4 fronds/palm) was worked out and expressed as mean number of leaflet/frond/palm (total of 4 leaflets/frond) (16 leaflets/palm) at 1 day before spraying (DBS), 7, 14, 21 and 28 days after spraying (DAS).

Evaluation of bio pesticides viz., *B. bassiana, I. fumosorosea* NBAIR pfu-5, *M. anisopliae, L. lecanii, Azadirachtin* 10000 ppm, soapnut powder and Jet water spray were carried out against RSW infested coconut palms with medium incidence during 2020-21 and 2021-22.

Estimation of RSW incidence and intensity (%) were also calculated using the following formulae:

$$\text{RSW Incidence (\%)} = \frac{\text{(Number of leaflets infested by RSW)}}{\text{(Total number of leaflets per palm)}} \times 100$$

$$\text{RSW Intensity (\%)} = \frac{\text{(Number of fronds infested by RSW)}}{\text{Total number of leaflets per leaf}} \times 100$$

Efficacy of bio pesticides against

a. Incidence and intensity of RSW, *A. rugioperculatus*

The pooled analysis of two years results revealed that, significantly lower incidence and intensity of RSW was observed in all the treatments with bio

I. fumosorosea NBAIR pfu-5 infested RSW nymph and adult

pesticides and jet water spray after the second spray onwards, compared to the untreated control palms. However, among the seven treatments tested, *I. fumosorosea* NBAIR pfu-5 spray gave the lowest incidence of RSW (37.98, 33.28 and 29.44 per cent at 14, 21 and 28 DAS) and RSW intensity (45.94, 41.71, 36.58 and 30.93 per cent) compared to the incidence (48.23, 51.35 and 52.96 per cent) and intensity of untreated control palms (50.89, 51.99, 54.86 and 55.73).

b. Nymphs of RSW, A. rugioperculatus

The pooled analysis of data indicated that, significant difference was observed among different treatments against RSW nymphs from 7th day and continued till 28th day after spraying. Treatment (T5) Azadirachtin 10000 ppm @ 1 ml/l recorded least number (25.74, 22.14, 17.67 and 15.82 nymphs) with 27.27 per cent reduction after spraying, 45.86 per cent reduction over control and proved to be superior over remaining treatments. The control

M. anisopliae infested adult

treatment (T8) was recorded with highest population of 33.47, 35.23, 38.81 and 42.76 nymphs per leaflet.

c. Adults of RSW, *A. rugioperculatus*

The pooled analysis of results depicted that, significant difference was observed among different treatments against RSW adults. *I. fumosorosea* NBAIR pfu-5 @ 5 g/l (T2) recorded lowest number (19.57, 17.39, 15.84 and 14.81 adults) with 24.99 per cent

B bassiana infested nymphs and adults

L. lecanii infested nymph and adult

reduction after spraying, 29.44 per cent reduction over control and proved to be superior over other treatments. The control palms (T8) were recorded with highest population of 22.01, 24.27, 24.44 and 25.08 adults per leaflet.

Conclusion

Considering all aspects in the present study, azadiracthin 10,000 ppm significantly reduced the nymphal population of RSW and *I. fumosorosea* NBAIR pfu-5spray was significantly superior against RSW adult population, pest incidence and pest intensity,compared to that of other treatments.

Further research studies on combined use of Azadiracth in and I. fumosorosea may be helpful for effective management of coconut RSW.

Acknowledgement

The author would like to express deepest gratitude to scientific and non-scientific staff of Dr. YSR HU - Horticultural Research Station (HRS), Ambajipeta for providing all necessary facilities during this research investigation.

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Seminar on 'Sustainable Coconut Processing Strategies for Global Market

CSIR-NIIST, Thiruvanthapuram, Kerala in association with International Coconut Community (ICC) and Coconut Development Board organized a Seminar on 'Sustainable Coconut Processing Strategies for Global Market on 12th September 2023 at CSIR-NIIST, Thiruvananthapuram in commemoration of the World Coconut Day. The seminar offered a platform for convergence of researchers, scientists, policy makers, officials from Central and State Governments agencies, agri-business experts, farmer groups, farmer producer organizations, entrepreneurs and exporters.

Dr. Jelfina C. Alouw, Executive Director of the International Coconut Community (ICC) while talking during the occasion stressed on the need for quality, sustainability and competitiveness in the coconut sector for the industry to sustain. Dr. Anantharamakrishnan, Director, NIIST presented the impacts of global warming on coconut production and called for promoting research and studies focused on solutions for the same. Dr. Hanumanthe Gowda, Chief Coconut Development Officer, CDB highlighted the challenges faced by farmers due to price fluctuations and lack of comprehensive strategy for processing.

Technical sessions and panel discussions on research and development interventions for cultivation, crop management and value addition of coconut were organized as part of the programme. The seminar brought research and industry closer and the issues faced by the industry in processing of coconut were presented by the entrepreneurs which was addressed through technology and policy by officials of NIIST and CDB. The outcome of the seminar was not only bridging of the gap between technology and the end user but also the creation of the road map for upgrading the coconut industry in terms of technology, quality and packaging.

Evaluation of Coconut suitability in soils of Semi Arid Land, South Telangana Plateau, Andhra Pradesh, India

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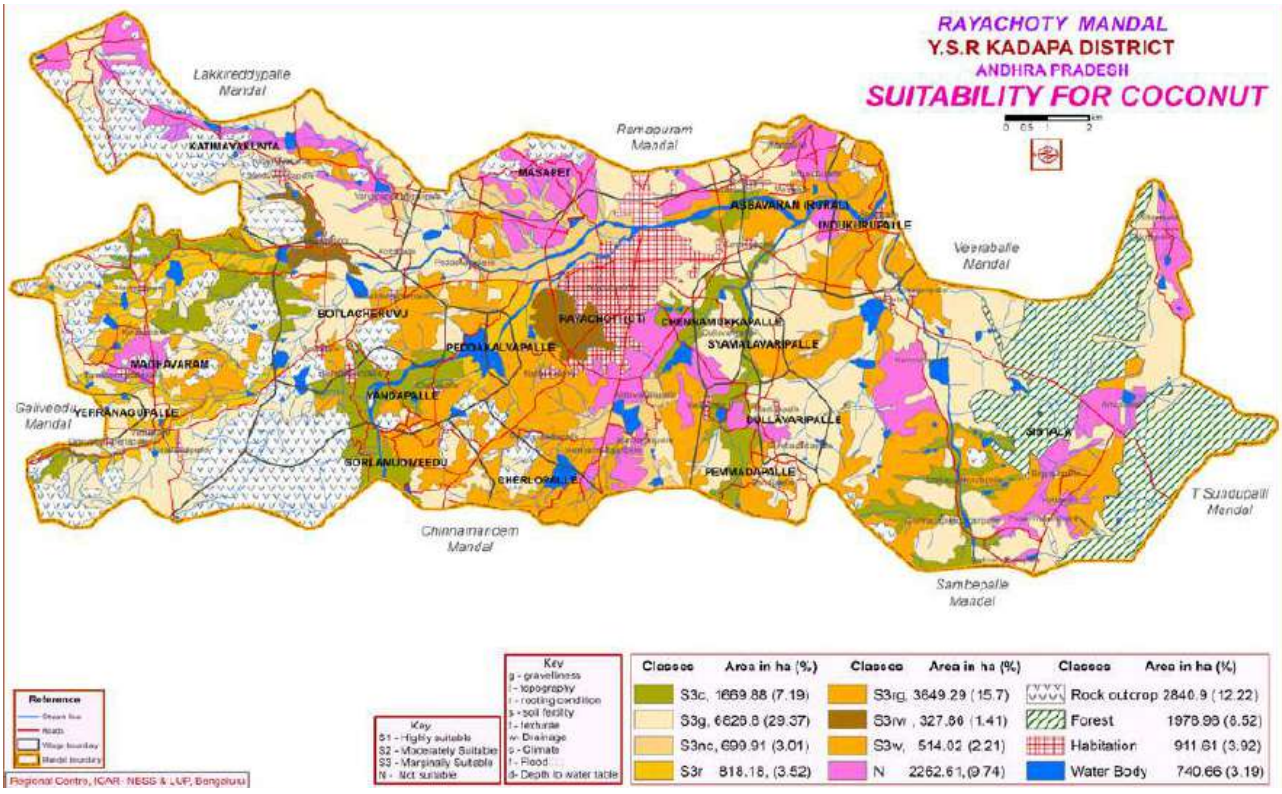

Map 1. Soil suitability for coconut in Rayachoty mandal, Andhra pradesh

India is the laregest producer of coconut in the world with a production of 20736 million nuts and productivity of 9430 nuts/ha. Kerala produces roughly 45% of India's coconuts, with some 92% of total production lying in the southern Indian states. Coconut plays an important role in the national economy of India. According to figures published by the Food and Agriculture Organization of the United Nations, India is one of the world's largest producers of coconut. Traditional areas of coconut cultivation are the Malabar and Coromandel coasts. The states of Kerala, Karnataka, and Tamil Nadu practise large-scale intensive farming of coconut.

Fig.1: Coconut production in irrigated land of Rayachoty Mandal, Andhra Pradesh

Soil site characteristics			Rating			
		Unit	Highly suitable S1	Moderately suitable S2	Marginally suitable S3	Not suitable
Climatic regime	Mean temperature in growing season	°C	26-29	23-25 30-32	20-22 33-34	
	Total rainfall	mm	1500-2500	1000-1500	500-1000	<500
	Dry months (Months with less than 50 mm rainfall)	Months	<3	4-5	6-7	

Land quality			Land characteristics			
		Unit	Highly suitable S1	Moderately suitable S2	Marginally suitable S3	Not suitable
Oxygen availability to roots	Soil drainage	Class	Well drained	Moderately well drained	Imperfectly drained, excessively drained	Poorly
	Depth of water table	m	2-3	1-2	0.5-1.0	
Nutrient availability	Texture	Class	cl, scl, sc, sicl, sil	sl, c (non-swelling)	c (swelling), ls, s	
	pH	1:2.5	5.1-6.5	6.6-7.5 4.5-5.0	7.6-8.5 4.0-4.4	
Rooting conditions	Effective soil depth	cm	>100	75-100	50-75	<50
	Presence of gravel in subsoil	%	<15	15-35	35-50	>50
	Presence of hard pan in subsoil	cm	>250	125-200	100-150	<100
Erosion hazard	Slope	%	<8	8-15	15.-30	-

Table 1. Soil-site suitability criteria for coconut

Fig. 2: Soil profiles in irrigated land cultivated with coconut in Rayachoty mandal, Andhra Pradesh

Soil survey data and the soil maps have been widely used for interpretative purposes by defining relative suitability or limitations of various soil types for different land use. Land suitability evaluation is the process of determining the potential of the land for alternative uses and forms a pre-requisite for land use planning. It integrates soil characteristics with climate and land use. Optimal requirement of a crop is always region specific, and soil site characteristics determine the degree of suitability for land use and help in planning expansion of area under a particular crop.

Land suitability evaluation done for coconut in Rayachoty mandal, YSR Kadapa district, Andhra Pradesh through detailed soil survey on 1:10000 scale (Chandrakala *et al.*, 2019). Soil-site suitability criteria for coconut presented in Table 1 represents the soil and climatic requirements of coconut for its sustainable production and productivity in a specific land unit. By using detailed soil survey data we have arrived with soil mapping units. Assigning soil site suitability criteria to particular mapping units, soil suitability map have been generated in the GIS environment.

In Andhra Pradesh, coconut is grown in an area of 1.05 lakh ha with a production of 16890.9 lakh tonne and a productivity of 15964 nuts/ha.

Mapping unit no.	Suitability classes	Description	Area ha	Area %
36,37,38,40, 51, 53	S3c	Marginally suitable land with slight limitation of climatic condition	1669.88	7.19
29,30,31,32, 33, 34,35,41, 42,43,44,45,46,47,48,49	S3g	Marginally suitable land with slight limitation of gravelliness	6826.8	29.37
52	S3nc	Marginally suitable land with slight limitation of soil fertility and climatic condition	699.91	3.01
27,28	S3r	Marginally suitable land with slight limitation of root restriction	818.18	3.52
9,10,11,12,13,14,15,16,17, 18,19,20,21,22,23,24	S3rg	Marginally suitable land with slight limitation of root restriction and gravelliness	3649.29	15.7
26	S3rw	Marginally suitable land with slight limitation of root restriction and drainage	327.86	1.41
39	S3w	Marginally suitable land with slight limitation of drainage	514.02	2.21
1,2,3,4,5,6,7,8,25,50	N	Currently not suitable	2262.61	9.74
		Soil total	16768.55	72.15
Rock outcrops			2840.9	12.22
Forest			1978.98	8.52
Habitation			911.61	3.92
Waterbody			740.66	3.19
Total geographical area			23240.7	100

Table 2 : Soil suitability for coconut in Rayachoty mandal, YSR Kadapa, Andhra Pradesh

Areas receiving good rains throughout the year (1500-2500 mm) and high relative humidity (>80 %) and preferably with a dry period of less than 3 months are favourable if temperature ranges from 26 to 29^{o}C. Coconut is grown at elevations of less than 600 m and on less than 8 per cent slopes on a wide variety of soil types, ranging from heavy clay to sandy soils, however deep to very deep; welldrained and medium textured soils are most suitable. Soil pH from 5.1 to 6.5 is ideal and the crop is sensitive to poor drainage and water logging, presence of free iron and aluminium, low pH in the sub soil, extreme gravelly and stony soils, sodicity and salinity.

Soil suitability for coconut in Rayachoty mandal is given in table 2 and map 1. Coconut is marginally suitable in 62.41 per cent of total geographical area with limitation of climatic condition, gravelliness, soil fertility, root restriction and drainage and 9.74 per cent of total area is unsuitable for coconut production in Rayachoty mandal (Chandrakala *et al.*, 2019a). Similar coconut suitability evaluation was done for Elamdasam Block, Idukki district, Kerala (Chandrakala et al., 2017 & 2019)

Conclusion

Coconut can be cultivated in Semi Arid Land of South Telangana Plateau, Andhra Pradesh provided with artificial irrigation through bore well/pump irrigation along with the application of mineral nutrients. Though climate is not highly suitable, coconut is marginally suitable in more than 60 percent of the Rayachoty mandal.

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Population dynamics of invasive Rugose Spiralling Whitefly, in East Godavari, Andhra Pradesh

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Coconut palm (Cocos nucifera) is often described as "Kalpavriksha" due to its multifarious use and plays an important role in world coconut export trade (Ahuja *et al.*, 2014). The coconut crop is mainly confined to the four southern states of India, accounting for 90% of the area under coconut, among which Andhra Pradesh shares about 1.05 lakhs ha area with a production of 1,689.09 m nuts. India has witnessed invasion of 118 exotic species of insects which includes several economically important whiteflies. A new addition to the list of whitefly species, an invasive Rugose Spiralling Whitefly (RSW), *Aleurodicus rugioperculatus Martin* (Hemiptera: Sternorrhyncha: Aleyrodidae) had entered to India and was reported on coconut palm for the first time during August-September, 2016 at Pollachi taluk, Coimbatore district in Tamil Nadu (Chandrika *et al.* 2017) and Palakkad taluk in Kerala and from Andhra Pradesh it was first reported at Kadiyapulanka nursery gardens during late December 2016 (Chalapathirao et al. 2018). Recently, studies of Raghuteja *et al.,* (2023) for the first time reported that East Coast Tall (ECT) variety of coconut palms infested with low, medium and high incidence of invasive *A. rugioperculetus* resulted in nut dropping of 4.06, 22.33 and 28.51% at Ambajipeta, while it was 4.68, 23.49 and 30.58% at Kalavalapalli coconut plantations. Whereas, in the case of Godavari Ganga hybrid palms nut dropping of 4.84, 27.48 and 35.32 % and 5.50, 28.11 and 36.01% was recorded at HRS, Ambajipeta and Kalavalapalli. The pest has spread across the country particularly in the East Godavari District of Andhra Pradesh famous for coconut plantations. Hence, keeping in view of rapid spread of RSW, field surveys were undertaken to assess its incidence, intensity and infestation levels in hotspot villages of East Godavari District of Andhra Pradesh.

Assessment of population dynamics of RSW and natural enemy count in coconut plantations.

The survey was conducted from January to February 2021 to ascertain incidence, infestation levels and intensity of RSW on coconut in randomly selected 15 and 12 villages of East Godavari districts of A.P and GPS co-ordinates of coconut plantations in each selected villages were also recorded simultaneously so as to prepare pest distribution maps. The data was recorded on per cent palm infestation (%), RSW incidence (%), RSW intensity (%), Infestation Grade Index (I.G.I), RSW life stages population and its natural enemies.

Five sample palms per plantation were selected randomly in each selected village and population assessment (spirals, nymphs, pupae and adults) was made on four randomly selected pest infested leaflets per leaf per palm from top, middle and lower whorl representing four directions (four leaves per palm) and worked out and expressed as mean of leaflet /leaf /palm (80 leaflets per five palms).

Five sample palms per plantation were selected randomly in each selected village. Data was collected on *Encarsia guadeloupae* paralyzed (pupae) and emergence holes, predator *A. astur* adults and naturally established eggs on four randomly selected pest infested leaflets per leaf per palm from the top, middle and lower whorl representing four directions (four leaves per palm) and worked out and expressed as mean of leaflet / leaf / palm (80 leaflets per five palms). The natural enemies viz., spiders, coccinellids and chrysopids if any were also documented in study.

Population of RSW and natural enemy count in coconut varieties viz., Godavari Ganga hybrid and local East Coast Tall (ECT) in East Godavari districts of Andhra Pradesh

The invasive rugose spiralling whitefly (RSW), *A. rugioperculatus Martin*, has expanded across the country, including Gujarat and Assam. In Andhra Pradesh Godavari district is an important coconut growing region and occupy more than 50,000 acres under coconut. Hence, field surveys were conducted in East Godavari districts to ascertain its incidence, intensity and infestation levels, as well as the documentation of natural enemies.

Incidence and intensity of RSW on coconut palms in villages of East Godavari district

In East Godavari District of Andhra Pradesh, the population dynamics of RSW was studied in 15 villages viz., Pulletikurru, Mukkamala, Nedunuru, Vakkalanka, Ambajipeta, Dosakayala Palli, Ramachandrapuram, Samanthakuru, Allavaram, Kadiyapulanka, Kadiam, Podurupaka, Kodurupadu, Veeravaram and Munganda are the important villages for coconut cultivation (Table 1).

S. No.	Name of the village	GPS co-ordinates	Per cent palm infestation (%)	RSW incidence (%)	RSW intensity (%)	Infestation Grade Index
1.	Pulletikurru	16°63'65"NL and 81°94'94"EL	84.21	38.46	54.40	1.6
2.	Muramalla	16°67'41"NL and 82°16'73" EL	72.55	50.00	87.15	1.7
3.	Nedunuru	16°64'24"NL and 81°98'89"EL	92.50	100.00	93.90	2.3
4.	Vakkalanka	16°65'92"NL and 81°95'14"EL	14.56	63.16	70.00	0.8
5.	Ambajipeta	16°59'38"NL and 81°95'36" EL	57.14	87.50	80.43	1.9
6.	Dosakayala Palli	17°12'46"NL and 81°85'39" EL	54.55	58.33	88.57	1.6
7.	Ramachandrapuram	16°83'72"NL and 82°03'25" EL	91.67	92.31	82.51	2.2
8.	Samanthakuru	16°47'51"NL and 82°04'89"EL	30.00	34.33	36.99	0.4
9.	Allavaram	16°50'78"NL and 81°98'89" EL	61.73	34.62	32.77	0.9
10.	Kadiyapulanka	16°89'31"NL and 81°81'42" EL	90.00	85.71	82.51	2.4
11.	Kadiam	16°91'36"NL and 81°81'83" EL	93.83	68.18	84.03	2.7
12.	Podurupaka	17°30'97"NL and 82°24'10" EL	100.00	91.67	96.09	2.5
13.	Kodurupadu	16°53'90"NL and 82°00'12" EL	40.00	38.46	34.88	1.0
14.	Veeravaram	16°87'61"NL and 81°83'06" EL	41.67	37.93	48.49	1.3
15.	Munganda	16°59'80"NL and 81°91'87" EL	50.00	21.28	27.58	1.7
Mean infestation (Mean + S.E)			**64.97+6.87**	**60.13+6.71**	**66.69+6.38**	**1.67+ 0.18 (medium)**

Table 1. Incidence and intensity of RSW on coconut palms in villages of East Godavari district, Andhra Pradesh (2021)

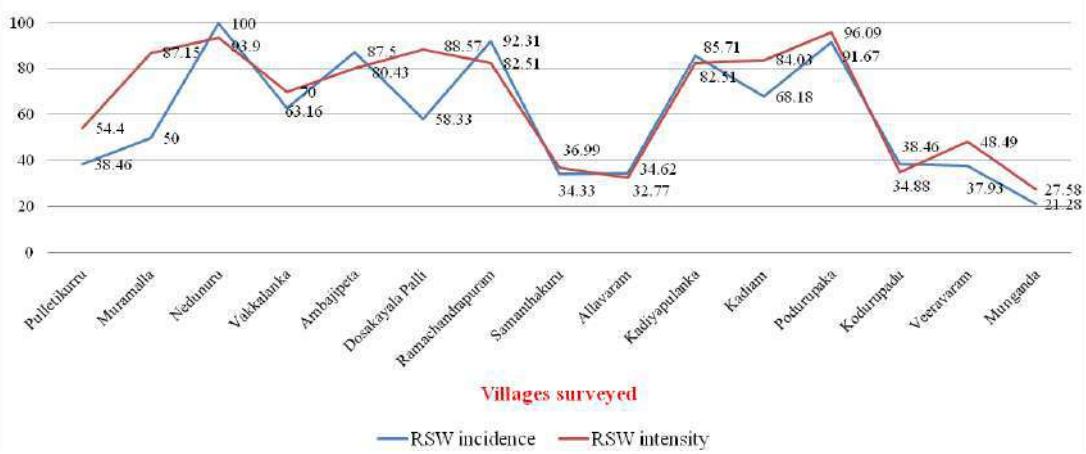

Figure 1. Incidence and intensity of RSW in villages of East Godavari District, Andhra Pradesh.

Per cent palm infestation (%)

The per cent (%) palm infestation was ranged from 14.56 to 100 per cent in which village Podurupaka recorded with highest infestation (100 per cent) followed by Kadiam (93.93 per cent). The mean per cent palm infestation was recorded as 64.97 per cent. The data from the study revealed that the severity of RSW on coconut palms was low to high in East Godavari District of Andhra Pradesh (Table 1). The per cent palm infestation (%) was found to be least in Vakkalanka village (14.56 per cent).

RSW incidence (%)

The incidence (%) of RSW in East Godavari District was in the range of 21.28 to 100 per cent. The mean RSW incidence was recorded as 60.13 per cent (Table 1 and Figure 1). Highest incidence was recorded in Nedunuru village (100 per cent) followed by Ramachandrapuram (92.31 per cent), whereas least incidence was recorded in Munganda village (21.28 per cent) (Plate 1).

RSW intensity (%)

The intensity (%) of RSW in East Godavari District was in the range of 26.58 to 96.09 per cent. Finally, the mean intensity calculated was 66.69 per cent (Table 1 and Figure 1). Highest intensity was recorded in Podurupaka village (96.09 per cent) followed by Nedunuru (93.90 per cent), while least intensity was recorded in Munganda village (27.58 per cent) (Plate 1).

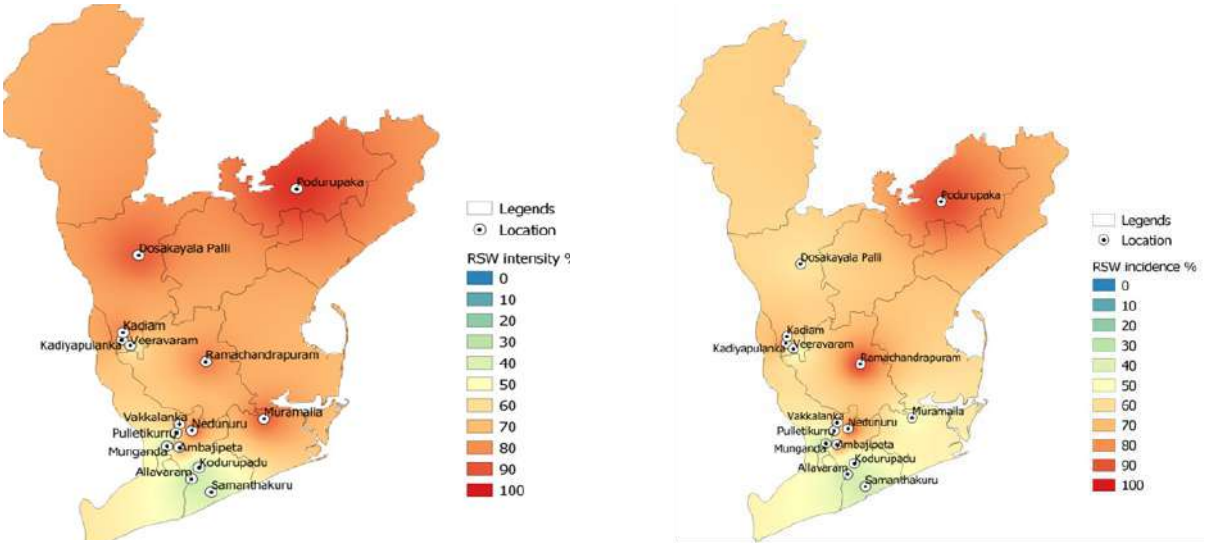

Plate 1. RSW pest distribution map in East Godavari district of A.P.

S. No.	Name of the village	RSW spirals	Nymphs	Pupae	Adults	E. guadeloupae paralyzed pupae	E. guadeloupae emergence holes	Predator A. astur	A. astur eggs	Other natural enemies observed
1.	Pulletikurru	4.56	5.53	8.50	7.34	1.55	0.25	0.20	0	Spiders
2.	Muramalla	3.23	4.27	5.67	5.15	1.68	0.55	0.40	0.22	Coccinellids
3.	Nedunuru	8.56	17.25	7.65	8.35	1.45	0.23	0	0	-
4.	Vakkalanka	7.55	11.26	8.35	9.15	0.55	0	0.35	0	Spiders and Coccinellids
5.	Ambajipeta	9.50	22.50	4.50	8.25	1.95	1.00	0.13	0	Spiders and Coccinellids
6.	Dosakayala Palli	11.25	28.65	9.00	7.74	1.90	0.95	0.45	0.20	Spiders and Coccinellids
7.	Ramachandrapuram	9.35	20.50	7.23	7.78	1.86	1.41	0.28	0.08	Spiders and Coccinellids
8.	Samanthakuru	1.89	1.88	1.86	1.55	0.23	0	0.01	0	Spiders, chrysopids
9.	Allavaram	1.69	1.91	1.15	1.66	0.21	0	0	0	Chrysopids
10.	Kadiyapulanka	8.91	21.25	10.31	8.38	1.63	0.49	0.43	0.29	Spiders
11.	Kadiam	13.63	27.26	7.96	26.14	2.21	0.71	0.38	0.55	-
12.	Podurupaka	11.50	24.65	9.50	8.68	1.85	1.23	0.25	0.10	-
13.	Kodurupadu	0.74	1.26	0.73	1.15	0.10	0	0	0	-
14.	Veeravaram	1.13	1.68	1.15	2.20	0.16	0	0.01	0	Spiders
15.	Munganda	0.40	0.95	0.66	1.10	0.10	0	0	0	Chrysopids
Mean Population (Mean + S.E)		**6.26 + 1.16**	**12.72 + 2.77**	**5.61 +0.93**	**6.97 + 1.59**	**1.16 + 0.21**	**0.45 + 0.13**	**0.17 + 0.05**	**0.08 + 0.04**	

Table 2. Population count of RSW life stages and natural enemies (per leaflet) on coconut palms in villages of East Godavari District of Andhra Pradesh.

Infestation Grade Index (I.G.I)

The Infestation Grade Index (I.G.I) was highest in Kadiam (2.7) followed by Podurupaka (2.5) village, whereas it was least in Samanthakuru (0.4) village. The mean I.G.I of RSW in East Godavari district was observed to be 1.67 (medium) with a range of 0.4 (low) to 2.7 (high) (Table 1).

RSW life stages

The data from the study revealed that the mean population of RSW life stages per leaflet in different villages of East Godavari district were recorded as 6.26 spirals, 12.72 nymphs, 5.61 pupae and 6.57 adults per leaflet. Furthermore, 1.16 of mean *Encarsia guadeloupae* paralyzed pupae, 0.45 *E. guadeloupae* emergence holes, 0.17 A. astur and 0.08 *A. astur* eggs were also recorded in E. Godavari district. More number of RSW life stages were recorded in Dosakayala Palli village (11.25 spirals, 28.65 nymphs, 9.00 pupae and 7.74 adults) (Table 2). The predatory spiders (Table 2), coccinellids such as Coccinella septumpunctata and Chrysopid, *A. astur* were also documented in RSW infested coconut plantations.

The per cent palm infestation, RSW incidence and intensity (%) were recorded to be high in Podurupaka village which could be attributed to aqua culture based coconut ecosystem with more emphasis on aquaculture resulting in stressed palm conditions coupled with non- adoption of IPM for RSW. The dwarf Gauthami Ganga variety and Godavari Ganga hybrid are the major plantations observed in Nedunuru village of coconut which being highly attractive to RSW resulted in recording of high RSW incidence and intensity. The dwarf coconut palms are more prone to heavy RSW infestation compared to tall palms (Sundaraj and Selvaraj, 2017; Chandrika *et al.* 2017 and Fousiya *et al.* 2019). Selvaraj *et al.* (2016) observed that invasive RSW prefers to colonize on hybrid and dwarf varieties viz., Chowghat orange dwarf (COD), Malaysian orange dwarf (MOD) and Gauthami Ganga in Tamil Nadu.

In Kadiam and Kadiyapulanka, places with highest incidence and intensity were recorded. Kadiam nurseries are famous nursery hubs for planting material of mango, sapota, banana, guava, citrus, ornamental plants (hibiscus, gerbera, gladiolus, jatropha, heliconia and chrysanthemum) and avenue trees (Akasha malli, areca palm, butterfly tree, false rubber, karanj and *Lagerstroemia speciosa*) all of which were documented as alternate hosts to RSW

From the survey it was found that the studies on population dynamics were conducted in villages of East Godavari districts of Andhra Pradesh (A.P) along with documentation of potential natural enemies. In East Godavari district of AP, mean per cent palm infestation was recorded as 64.97 per cent. The mean incidence and intensity of RSW were recorded as 60.13 and 66.69 per cent. The mean population of RSW life stages per leaflet in different villages of East Godavari district were recorded as 6.26 spirals, 12.72 nymphs, 5.61 pupae and 6.57 adults per leaflet. Furthermore, 1.16 of mean *Encarsia guadeloupae* paralyzed pupae, 0.45 *E. guadeloupae* emergence holes, 0.17 *Apertochrysa astur* and 0.08 A. astur eggs were also recorded in East Godavari district. As a result of population dynamics studies, medium to high incidence of RSW was recorded in East Godavari districts of Andhra Pradesh.

Acknowledgements

The author is thankful to the staff of Dr. YSR HU-Horticultural Research Station (HRS), Ambajipeta and Dr. YSR HU – College of Horticulture (COH), Venkataramannagudem.

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Annapoorna-Anufood-2023

Coconut Development Board participated in International Exhibition "Annapoorna-Anufood India-2023 from 7th to 9th September-2023, held at Bombay Exhibition Centre, Goregaon, Mumbai, Maharashtra.

Both international and domestic exhibitors participated in the event which created a professional platform for the food, drink and hospitality sectors across the globe. Over 200 exhibitors which included companies from manufacturing machines, equipment, semi processed products in the food and food drink industry exhibited their products.

Coconut Development Board participated in Annapoorna-Anufood-2023 with an objective to propagate Boards activities and schemes related to coconut farming, by-product utilization, manufacturing and marketing and to identify prospective distributors/ entrepreneurs and retailers for coconut products in India and abroad.

M/s. Vepuri Agro Product Pvt. Ltd. manufacture of Coconut oil, Virgin Coconut Oil, Desiccated Coconut Powder; M/s. Habhit Wellness Pvt Ltd. Andheri East Mumbai, manufacturer of Coconut Water and Nata de coco, M/s. Keratech (P) Ltd. Kerala, Manufacturer of Virgin Coconut Oil, Desiccated Coconut Powder, Virgin plus tablets and Coconut Cream; M/s. Madhura Coco Fest, Coimbatore, Tamil Nadu manufacturer of Tender Coconut water, Coconut Milk shake and Coconut sugar, M/s. KKR Extraction Pvt. Ltd, Palakkad, Kerala, Manufacturer of Coconut Oil, Coconut Soap, Virgin coconut oil, coconut water, M/s. Nata Nutrico Coconut Food Product LLP, Kannur Kerala, manufacturer of Nata De Coco, M/s. Agricoles Natural foods, Palakkad Kerala; manufacturer of Tender Coconut Water, M/s. Konsseema Agro Products, Mallayapalem, East Godawari District, Andhra Pradesh; manufacturer of Virgin Coconut oil, Desiccated coconut powder, M/s. Rubco House South Bazar Kannur, Kerala; manufacturer of Virgin Coconut Oil, Desiccated Coconut Powder, Coconut Oiland M/s. KPL Oil Mills Private Limited, Trissur, Kerala, manufacturer of Coconut Oil and Coconut Cake displayed their products and services in the Board's stall.

Coconut Development Board displayed various value added coconut products viz. Packed Tender Coconut water, Coconut oil, Coconut Milk Powder, Virgin Coconut oil and well informative charts and posters etc. publications were also distributed in the CDB stall. Around 1200 business queries were received from interested parties.

Hindi Fortnight 2023

Coconut Development Board is observing Hindi Fortnight 2023 from 14th September 2023. Dr. Hanumanthe Gowda, CCDO, CDB inaugurated the Hindi Fortnight celebrations of the Board on 14th September 2023 at CDB, Kochi. Shri. R. Madhu, Secretary, CDB spoke during the occasion. Smt. Vindu Bijoy Prabhakaran, delivered the welcome address. Message from the CEO, CDB was read out during the occasion.

Cultivation practices in Coconut Garden - October

Planting

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

Manuring

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

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

Irrigation

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

Green manuring

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

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

Intercultural operations

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

Nursery managements

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

Mulching

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

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

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

Pest and Disease Management in Coconut

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

I. Cocout eriophyid mite, *Aceria guerreronis*

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

Mite damaged nuts

Progression of mite damage

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

Mite colony

Management

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

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

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

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

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

II. Coreid Bug, *Paradasynus rostratus*

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

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

Management

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

III. Nut borer, *Cyclodes omma*

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

Management

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

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

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

IV. Bud rot or immature nut fall

Nut boring caterpillar

Damaged buttons

(*Phytophthora palmivora*)

In certain humid locations bud rot occurred regularly killing hundreds of trees. In India, bud rot incidence is recorded as less than one per cent. Pathogen attacks the bud region leading to rotting of bud and death of palms. The first visible symptom is withering of the spindle marked by pale colour. The spear leaf or spindle turns brown and bends down. The affected spear leaf can easily be pulled out as the basal portion of the spindle is completely rotten emitting a foul smell. Temperature range of 20- 24ºC and relative humidity of 98% - 100% were found optimum for the development of the bud rot disease. Contiguous occurrence of such “favourable days” during rainy seasons determines the development of the disease and the intensity of infection. As Phytophthora diseases are known to be extremely fatal, a close scrutiny is mandatory during monsoon period to assess the health of the palm especially the spear leaf zone.

Management

- Regular cleaning of the crown and prophylactic spraying of Bordeaux mixture (1%) to the crown just before the onset of monsoon and one more spray after 35-40 days help in reducing the bud rot incidence.


Withering of spear leaf


Bud rot affected palm

- Field sanitation and provide proper drainage during rainy season.
- Placement of two Trichoderma (*Trichoderma harzianum* CPTD28 isolate) enriched coir pith cakes in the inner most leaf axils just before the onset of monsoon and again after every two months as prophylactic measure.
- In disease affected palms, remove the entire rotten portion of the spindle by cutting with a sharp knife and apply 10% Bordeaux paste to the wound and cover with polythene sheet to prevent entry of rain water. The protective covering has to be retained till normal shoot emerges.

Nut fall

Nut fall may be due to genetic/ physiological factors, nutrient imbalance/ deficiency, poor pollination, attack by insects or mites, water logging/drought or fungal infection. Major fungal species associated with nut fall are Phytophthora palmivora and Lasiodiplodia theobromae. In the case of Phytophthora palmivora infection, water-soaked lesions appear on the surface of the nuts. The lesions turn brown and the nut detaches from the bunch. Phytophthora infection is more common during rainy season and occurs in high humid areas. Nut infection by *Lasiodiplodia theobromae* appear as dark grey to brown lesions with wavy to undulated margins As infection progresses, decay and discolouration of mesocarp and endosperm of nuts are also observed. Severe infection results in desiccation, shrivelling, deformation and premature dropping of nuts. Lasiodiplodia infection is severe in mite infested nuts and occurs throughout the year. It is seen in dry areas also


Lasiodiplodia infection symptoms


Phytophthora infection symptoms

Management

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

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

Market Review – August 2023

Domestic Price

Coconut Oil

During the month of August 2023, the price of coconut oil opened at Rs. 13,200 per quintal at Kochi, Rs.13,500 per quintal at Alappuzha market and Rs.14,200 per quintal at Kozhikode market.

The price of coconut oil closed at Rs. 13,000 per quintal at Kochi and Alappuzha markets and Rs.14,200 per quintal at Kozhikode market with a net loss of Rs. 200 per quintal at Kochi and Rs. 500 per quintal at Alappuzha market and the price showed a downward trend during the month.

During the month, the price of coconut oil at Kangayam market opened at Rs. 11,600 per quintal and closed at Rs. 11,133 per quintal with a net loss of Rs. 467 per quintal.

Weekly price of coconut oil at major markets Rs/Quintal)				
	Kochi	Alappuzha	Kozhikode	Kangayam
01.08.2023	13200	13500	14200	11600
05.08.2023	13200	13500	14300	11400
12.08.2023	13100	13000	14300	11333
19.08.2023	13000	13000	14200	11067
26.08.2023	13000	13000	14200	11133
31.08.2023	13000	13000	14200	11133

Milling copra

During the month, the price of milling copra opened at Rs. 8500 per quintal at Kochi, Rs. 8450 per quintal at Alappuzha and Rs. 8750 per quintal at Kozhikode market.

The prices of milling copra closed at Rs. 8350 per quintal at Kochi market, Rs. 8300 per quintal at Alappuzha market and Rs. 8650 per quintal at Kozhikode market with a net loss of Rs. 150 per quintal at Kochi and Alappuzha market and Rs. 100 per quintal at Kozhikode market and it showed a downward trend during the month.

The price of milling copra at Kangayam market opened at Rs. 8050 and closed at Rs. 7750 with a net loss of Rs. 300 per quintal during the month.

Weekly price of Milling Copra at major markets (Rs/Quintal)				
	Kochi	Alappuzha (Rasi Copra)	Kozhikode	Kangayam
01.08.2023	8500	8450	8750	8050
05.08.2023	8500	8450	8800	7900
12.08.2023	8450	8350	8750	7750
19.08.2023	8350	8300	8700	7700
26.08.2023	8350	8300	8700	7750
31.08.2023	8350	8300	8650	7750

Edible copra

During the month the price of Rajpur copra at Kozhikode market opened at Rs. 9100 per quintal expressed a downward trend during the month and closed at Rs. 9000 per quintal with a net loss of Rs. 100 per quintal.

Weekly price of edible copra at Kozhikode market (Rs/Quintal)	
01.08.2023	9100
05.08.2023	9300
12.08.2023	9200
19.08.2023	9200
26.08.2023	9000
31.08.2023	9000

Ball copra

The price of ball copra at Tiptur market opened at Rs. 9000 per quintal and closed at Rs.8600 per quintal with a net loss of Rs. 400 per quintal.

Weekly price of Ball copra at major markets in Karnataka (Rs/Quintal) (Sorce: Krishimarata vahini)	
01.08.2023	9000
05.08.2023	9000
12.08.2023	9400
19.08.2023	8800
26.08.2023	8900
31.08.2023	8600

*NR-Not reported

Dry coconut

At Kozhikode market, the price of dry coconut opened at Rs. 9500 per quintal and closed at the same price during the month.

Weekly price of Dry Coconut at Kozhikode market (Rs/Quintal)	
01.08.2023	9500
05.08.2023	9500
12.08.2023	9500
19.08.2023	9500
26.08.2023	9500
31.08.2023	9500

Coconut

At Nedumangad market in Kerala, the price of coconut opened at Rs. 13,000 per thousand nuts and closed at the same price during the month.

At Pollachi market in Tamilnadu, the price of coconut opened Rs. 22,500 per ton and closed at Rs. 21,500 per ton with a net loss of Rs.1000 during the month.

At Bangalore market in Karnataka, the price of coconut opened at Rs. 20,000 per thousand nuts and the price was almost steady during the month.

At Mangalore market in Karnataka, the price of coconut opened Rs. 32,000 per ton and closed at Rs. 28000 per ton with a net loss of Rs.4000 during the month.

Weekly price of coconut at major markets				
	Nedu-mangad (Rs./1000 coconuts)#	Pollachi (Rs./MT) ##	Bangalore Grade-1 coco-nut,(Rs./ 1000 coconuts) ##	Mangalore Black coconut (1 tonne) ##
01.08.2023	13000	22500	20000	32000
05.08.2023	13000	23000	20000	29000
12.08.2023	13000	22500	20000	26000
19.08.2023	13000	21500	20000	28000
26.08.2023	13000	21500	20000	28000
31.08.2023	13000	21500	20000	28000

International price

Coconut

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

Weekly price of dehusked coconut with water				
Date	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India*
05.08.2023	126	132	200	278
12.08.2023	124	138	195	272
19.08.2023	122	137	190	260
26.08.2023	123	144	188	260
				*Pollachi market

Coconut Oil

The price of International price and domestic price of coconut oil showed a downward trend during the month. International price and domestic price of coconut oil at different international/ domestic markets are given below.

Weekly price of coconut oil in major coconut oil producing countries					
	International Price(US$/MT)	Domestic Price(US$/MT)			
	Philippines/ Indonesia (CIF Europe)	Philip-pines	Indo-nesia	Sri lanka	India*
05.08.2023	1102	1174	NR	1963	1379
12.08.2023	1105	1148	NR	1838	1371
19.08.2023	1113	1120	NR	1748	1339
26.08.2023	1090	1107	NR	1582	1347
					*Kangayam

Copra

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

Weekly International price of copra in major copra producing countries				
Date	Domestic Price (US$/MT)			
	Philippines	Indonesia	Srilanka	India* * Kangayam
05.08.2023	648	605	1052	956
12.08.2023	637	616	950	937
19.08.2023	631	617	959	931
26.08.2023	633	627	895	937
				* Kangayam

#(Source: Epaper,Kerala Kaumudi),
##(Source: Star market bulletin)

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September 2023
Vol. LXVI No.03
Price: Rs.6

Registered No.KL/EKM/721/2021-23
Licence No. KL/CR/EKM/WPP-18/2021-23
Licensed to Post Without Prepayment
RNI No. 3032/1957

INDIAN COCONUT JOURNAL
Date of Publication - 22/9/2023

Printed and Published by Mini Mathew on behalf of Coconut Development Board, Printed at M/s KBPS, Kakkanad, Kochi-30 and Published at Coconut Development Board, Govt. of India, Ministry of Agriculture and Farmer's Welfare, Kera Bhavan, Kochi-11, Editor: Deepthi Nair S