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ஆண்ட றிக்கை
ANNUAL REPORT 2022

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தென்னை, கித்துல் மற்றும் பனைச் செய்கை மேம்பாடு மற்றும் அவை சார்ந்த பண்டங்கள் உற்பத்தி மற்றும் ஏற்றுமதி பல்வகைப்படுத்தல் அமைச்சு

STATE MINISTRY OF COCONUT, KITHUL AND PALMYRAH CULTIVATION AND RELATED INDUSTRIAL PRODUCT MANUFACTURING & EXPORT DIVERSIFICATION

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தென்னை ஆராய்ச்சி நிறுவகம்
Coconut Research Institute

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பெருந்தோட்டக் கைத்தொழில் அமைச்சு
Ministry of Plantation Industries

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Our Vision

To be the center of excellence in coconut research, technology development and technology transfer in the region

Our Mission

Generate knowledge and technology through excellence in research towards increasing productivity and profitability of coconut

Our Mandate

Conduct and further scientific research on growth and cultivation of coconut palm, growing other crops and engage in animal husbandry in coconut plantations and prevent and cure of diseases and pests.

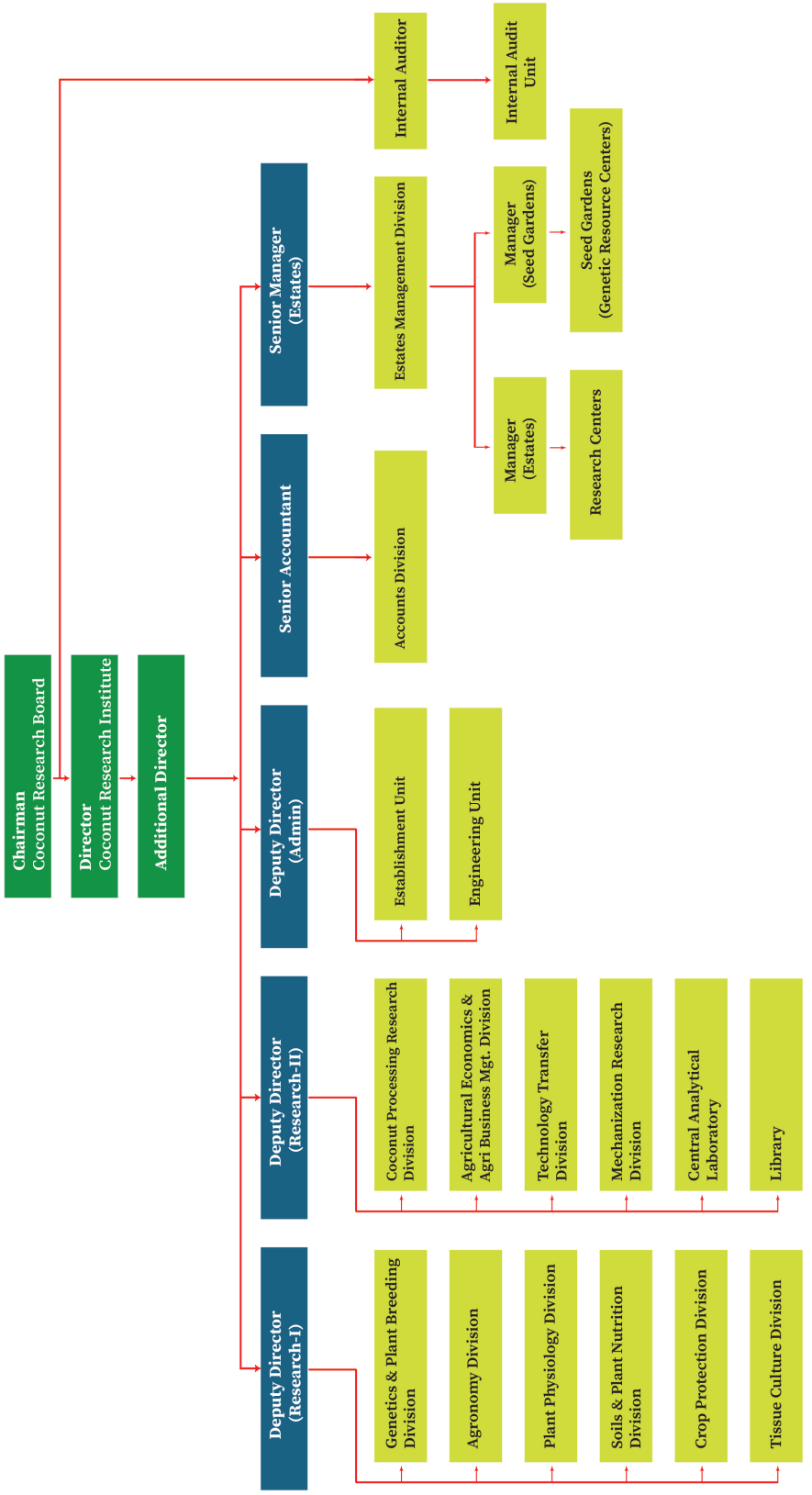
Conduct and further scientific research on processing and utilization of coconut products and value addition

Establish and maintain institutes' seed gardens and experimental stations

Train advisory and extension workers to assist the coconut industry

Guide and advise coconut industry on all matters of technical nature

ORGANOGRAM OF THE INSTITUTE



STATE MINISTRY OF COCONUT, KITHUL AND PALMYRAH CULTIVATION PROMOTION AND RELATED INDUSTRIAL PRODUCT MANUFACTURING & EXPORT DIVERSIFICATION

Coconut Research Institute

Annual Report - 2022

The Coconut Research Institute was founded in 1929 as the Coconut Research Scheme under the Coconut Research Ordinance No.24 of 1928. The scheme established its headquarters at Bandirippuwa Estate, Lunuwila with three Technical Divisions namely Genetics, Chemistry, and Soil Chemistry. Following the enactment of the Coconut Research Act No.37 in 1950, it was renamed as the Coconut Research Institute of Ceylon. Under the Coconut Development Act, No.46 promulgated in 1971, the Coconut Research Board was set up in 1972 to function as the Board of Management of the Coconut Research Institute.

The Coconut Research Board (CRB)

The governing body of the Institute is the Coconut Research Board. In terms of the Coconut Development Act, the Board consists of 11 members, appointed by the Minister-in-charge. One member is appointed as the Chairman of the Board. The members hold office for three years and are eligible for reappointment. Twelve meetings were held during the year.

Member of the Board	Record of Attendance
Dr. Saranga Alahapperuma / Chairman / CRB	10/10
Mr. T. M. T. Malraj Peiris / Chairman / CRB	02/02
Ms. K. M. B. T. Karunasena/Ministry Representative	07/09
Ms. S. N. Attanayake/Ministry Representative	03/03
Dr. S. H. S. A. De Silva, DG/DOA	08/09
Dr. S. F. N. Silva, CGA	03/03
Mr. Lionel Fonseka, CGA	03/04
Mr. R. A. L. Udaya Kumara/Treasury Representative	03/03
Mr. J. M. S. N. Jayasinghe/Treasury Representative	08/09
Mr. Bandula Egodage	11/12
Dr. C. S. Ranasinghe, Director/CRI	07/07
Mr. Prabath Wimal Kumara/Sec. Dir/CARP	10/12
Mr. Chitral Jayawarna	12/12
Mrs. A. V. K. M. Herath, Chairman/CCB	06/12
Mr. Keerthi Sri Weerasinghe, Chairman/CDA	04/12

Dr. Lalith Perera (Aditional Director) served the Board as the Director (Cover up) during June-October, 2022.

CRB : Coconut Research Board
CRI : Coconut Research Institute
DOA : Department of Agriculture
CGA : Coconut Growers' Association
CARP: Council for Agricultural Research Policy
CDA : Coconut Development Authority
CCB : Coconut Cultivation Board

The Audit and Management Committee

Altogether 03 meetings were held during the year to discuss the Audit & Management activities of the Institute.

The members of the Audit committee are,

	Name	Record of attendance
Chairman & Treasury Representative	Mr. J. M. S. N. Jayasinghe	3/3
Ministry Representative	Mrs. Sureka N. Attanayake	1/3
	Mrs. Buddhi T. Karunasena	2/3
Board member	Mr. Bandula Egodage	1/3
	Mr. Lionel Fonseka	1/3
Observer from AGD	Mrs. R. M. M. S. Perera	2/3
	Mr. A Podiralahamy	1/3
	Mr. K. A. C. Shamantha	2/3
	Mrs. V. D. Seetha	1/3
Director/CRI	Dr. Sanathanie Ranasinghe	2/3
Internal Auditor	Mr. P W A Fernando	3/3
Convener, CRI/AC, Additional Director/CRI	Dr. Lalith Perera	3/3

AGD: Auditor General's Department

Chairman's Message

Stability and better performances are two very important factors that should be considered in sustaining any sector. Coconut as a crop has shown its ability to contribute significantly to the national economy though producing food, providing livelihood for people, and generating foreign exchange to the economy. Even under the prevailed economic crisis of the country in 2022, due to the COVID pandemic situation, the coconut industry operated well with the intervention of Plantation Ministry and the mediation of Coconut Research Institute, Coconut Development Authority and Coconut Cultivation Board. During the current year, annual National Coconut Production reached to the recorded highest production of 3,353 million nuts, earning foreign exchange of Rs. 262 billion (USD million 817) and contributing 0.7% to GDP.

In the process of generating above significant foreign exchange earnings, I am proud to say that Coconut Research Institute (CRI) activity intervened in resolving issues of industry operations, badly affected during 2022 due to fuel, foreign exchange, and input shortages. CRI introduced the direct fuel issuing mechanism to the processing sector, arranging fuel from Central Transport Board, and allowing fuel purchases for USD. These arrangements worked well and were of examples to other sectors also. In addition, CRI involved in resolving the issues in exporting containers, allowing restricted inputs for processing industry and issuing foreign exchange for processing industry.

Coconut Research Institute continued its research program however, with great difficulties in year 2022 especially due to limited fund availability and under limited resources. The focus of the research program was to increase crop production, reduce crop losses, develop value added products, improve performance of coconut sector through implementation of proper policies. During the year, CRI issued three new recommendations; Neem oil and soap mixture to control white fly, Gini grass as a raw material to produce compost and vermi-compost and Gini grass as fodder for livestock in coconut plantations. In addition to that CRI issued policy recommendations to resolve issues of the coconut sector due to prevailing economic crisis. I am happy to say that most of those recommendations were successfully implemented benefiting the industry to continue their operations.

Furthermore, I am happy to announce that CRI was able to add 6,133 mother palms for hybrid seed production through hand pollination in CRI Genetic Resources Centers. This is remarkable achievement in the history of hybrid seed nut production. CRI conducted technology transfer activities to transfer the developed technologies to the stakeholders to promote technology adoption. In addition, CRI implemented different approaches in disseminating CRI developed technologies. In focusing this objective, CRI made significant improvements to its web site, introduce a hotline, a WhatsApp number, and a Facebook page as electronic media tools for technology transfer and information dissemination. I am also happy to mention that these approaches were worked out every well and as a result, in 2022,

CRI won the gold medal for the best website in the government sector, silver medal for the best citizen service website and the overall bronze medal for the best website at the Best Web.Lk completion organized by the LK Domain Registry. Further to that CRI was well recognized in 2022 by awarding the best annual report and financial account report in the research institute category organized by the Association of Public Finance and Accounts of Sri Lanka. In addition to that CRI has won more than eleven awards for research publications.

During the year, CRI continued technology transfer process to the Coconut Cultivation Board mainly through several research and extension dialogues. CRI also collaborated with the other local and international institutes including Universities, National Engineering Institute, and foreign institutes to continue its research program effectively. Scientists of CRI served as resource persons for many programs; national and international symposia and conferences and policy making process in the country. I would like to note here that CRI is working in right direction to develop the required knowledge base for the growers and coconut industry.

I Wish to thank all staff of the institute and the estates for their untiring efforts to achieve the goals of the institute. Moreover, it is my duty to appreciate the support, assistance and guidance Provided by the Hon. Ministers and all the officials from the ministry.

I wish CRI every success in future activities.

Malraj Peiris

Chairman

Coconut Research Board

Director's Message

The CRI continued to serve the coconut industry by research recommendations, development activities and services. The present year was fairly a successful year for coconut sector achieving a national coconut production of 3,353 Mn nuts and this was the second consecutive year in which the national production exceeded 3.3 Bn nuts. The industry was able to generate USD 817 million foreign exchange by exporting value-added coconut products. However, it was a very challenging year with respect to pest attacks as severe infestation of coconut whitefly was reported in coconut and king coconut plantations in many districts, including the major coconut triangle. For controlling white fly infestation, a natural insecticide mixture consisting of Neem oil, soap powder and water was recommended and biological control agents were identified. Technology for production of coconut butter, spread cheese using Coconut Skimmed Milk, biodegradable packaging from coconut protein isolates and biocelluloses and coconut flour based low GI bread were developed. Fabrication of prototype coir pith dryer and upgrade of Ceylon Bristle Fiber Extraction Drum was completed in collaboration with NERD, CDA, EDB, and Substrate Industry and industry testing was commenced. Panicum maximum which is considered an invasive problematic weed in coconut plantations was recommended as a raw material to produce compost and vermicompost and as a fodder for livestock in coconut plantations.

Research on screening and developing coconut cultivars tolerant to heat/drought stress, Weligama Coconut Leaf Wilt Disease (WCLWD) and Aceria mite, improving tissue culture technology, using king coconut husk biochar as a source for potassium and for soil amendment, developing a K-enriched fertilizer brickette, using Municipal Solid Waste (MSW) in coconut plantations, identifying new mulching material, developing / improving the technology for value added coconut products and developing /upgrading machinery used for coir sector was continued satisfactorily. Policy recommendations on export and import of coconut products and its substitutes and special commodity levy changes of coconut oil and palm oil were made to the policy makers.

As development programmes, three Genetic Resources Centres of CRI and Kiniyama Seed Garden with Chilaw Plantation Ltd were maintained satisfactorily and produced 1.5 Mn genetically superior coconut seed nuts during the year. A new set of 6133 mother palms were added to the hand pollination program in CRI estates and partnership projects were initiated with Kurunegala Plantation Ltd, Kandakadu Agric Farm of SL Army and CIC Agribusiness to increase the hybrid seed nut production. A field pollen bank using rare coconut cultivars; Sri Lanka Brown Dwarf (SLBD), Malayan Red Dwarf (MRD) and Brazilian Green Dwarf (BGD) was established at the Bandirippuwa Estate. Managing the Weligama Coconut Leaf Wilt Disease (WCLWD) in the Southern Province, specially the ‘protective zone’, was continued to prevent the spread of the disease to other areas.

As technology transfer activities, a media unit was established at the CRI mainly to make people aware of the industry related issues, special media programmes were conducted on control of whitefly infestation, technical assistance was provided through hot line 1928 and WhatsApp number 070 400 1928, training on coconut value added products was provided at the Business Incubation facility, Research-extension dialogues between CRI and Coconut Development Officers (CDOs) of the CCB were conducted, the certificate course on coconut cultivation and value addition program was conducted, practical knowledge on coconut cultivation was disseminated at the Technology Park, CRI-developed technology for improving shelf life of king coconut was disseminated to new entrepreneurs for exporting king coconut and more than 10.87 Mn tender king coconuts were exported using this technique during the year.

As services, a dedicated Central Analytical Laboratory (CAL) was established to offer an efficient service to the stakeholders, coconut seedling certification service was continued, predatory mites for Aceria mite, parasitoids for coconut caterpillar and aggregation pheromones for red weevil were produced and supplied to growers, National Coconut yield for 2022 was forecast (3,319 Mn nuts), Actual Coconut Production for 2022 was estimated (3,353 Mn nuts).

As major achievements, in addition to above recommendations and technology developments, 12 research papers in Science Citation Indexed Journals, 11 research papers in international journals, 02 research papers in local refereed journals, 20 research papers in national and international symposia, 03 book chapters, 03 policy documents and 03 other articles were published. Annual Report 2020 of the CRI was awarded the Golden Award in the "Public Sector – Research Institutions" category, at the Best Annual Reports & Accounts Awards for Public Sector – 2020, organized by the Association of Public Finance Accountants of Sri Lanka (APFASL) during this year. The Official website of the CRI was awarded the Golden Award in the "Best Government Website" category, the Silver Award in the "Best Citizen Service Website" category and the Bronze Award in the "Overall" category at the BestWeb.lk - 2022 awards ceremony organized by the LK Domain Registry.

In the CRI estate sector, a total of 5.17 Mn coconuts were produced compared to 5.13 Mn nuts in 2021 with an average cost of production (COP) of Rs.33.20 and the Net Sale Average (NSA) of Rs.56.98 /nut.

Finally, its with great pleasure, the dedicated services, cooperation and support extended by the staff of the CRI towards all these achievements made during 2022 are greatly appreciated. The support extended by the Hon. Minister, State Minister, Secretaries and the officials of the Plantation Ministry and the State Ministry, Chairman and the Board of Directors are also greatly appreciated.

I wish CRI every success.

Dr Sanathanie Ranasinghe

Director, Coconut Research Institute

RESEARCH RECOMMENDATIONS

Neem oil and soap mixture to control whitefly in coconut

Crop Protection Division

A natural insecticide mixture consisting of Neem oil, soap powder and water was recommended for controlling whitefly infestations. The composition of the natural insecticide mixture is as follows.

Neem oil - 10 ml

Soap powder - 05 g

Water - 01 L

5-8 liters of the mixture should be sprayed on to the abaxial surface of the leaflets in bi-weekly intervals for 2 months to achieve a successful control of the pest.

Fig 01. Spraying of Neem oil and soap mixture to control the whitefly infestations

Panicum maximum as raw material to produce compost and vermicompost

Agronomy Division

Panicum maximum which is considered as an invasive problematic weed in many agricultural ecosystems including coconut plantations, contains 1.49 - 0.71% nitrogen, 0.29 - 0.19% phosphorous, 3.16 – 1.91% potassium, 0.571 - 0.429% calcium and 0.451 - 0.322% magnesium as leaf nutrients. After cutting 15 cm above the ground level, naturally grown *P. maximum* can be recommended as raw material to produce compost and vermicompost during the 4 – 12 weeks of growth stages before flowering. Production efficiency of compost and vermicompost is 13 - 20% and 11 - 16% respectively.

Table 01. The average nutrient content of the compost and vermicompost produced using *Panicum maximum*

	Nitrogen (%)	Phosphorous (%)	Potassium(%)	Organic Carbon (%)
Compost	2.30 - 1.62	0.80 - 0.42	2.53 - 1.83	23.79 - 20.49
Vermicompost	2.20 - 1.63	0.74 - 0.55	3.10 - 2.03	27.82 - 21.78

Fig 02. *Eisenia fetida;* earth worm used for the production of vermicompost

Panicum maximum as fodder for livestock in coconut plantations

Agronomy Division

After cutting 15 cm above the ground level, naturally grown *Panicum maximum* can be recommended to harvest at eight weeks of growth stage to feed the livestock in coconut plantations. This contains 9.32 - 4.53% crude protein, 9.49 - 7.32% ash and 39.63 - 36.39% crude fibre content. The dry matter yield of this grass is 0.84 – 1.89 Mt/ha during the 4 – 12 weeks of growth stages.

Fig 03. Harvesting *Panicum maximum* from a naturally existing field

POLICY PROPOSALS

Policy Proposals 2022

Agricultural Economics & Agribusiness Management Division

Subject: Economic Crisis in 2022 Sri Lanka and Its Effects and Consequences on Coconut Industry: Strategies to Mitigate the Effect

Background: Economic crisis in Sri Lanka reached a very high critical stage transferring its effect to all individuals, all the economic key sectors finally whole economy and the country. Although COVID 19 pandemic situation existed during the past three years, the coconut industry showed significant positive growth earning foreign exchange of USD million 834, producing 3,300 million nuts while satisfying the local coconut demand. During the year 2022 coconut-based products and processing factories operated favourable manner but due to the prevailing economic crisis, there were obstacles in operating the processing industry. In addition to that coconut cultivation sector also were affected due to input shortages and due to increasing operational costs as nut prices remain stagnated. As the country faced a severe crisis of earning foreign exchange, the coconut industry has the potential of earning more dollars for the country if the government can facilitate some needs and do the necessary adjustments in the operating process. Further, the country is wasting huge amounts of foreign exchange to import coconut oil though other alternative options are available.

Issue 1: Fuel shortage for the coconut processing industry and the cultivation sector

Strategy: Ensure Ceylon Petroleum Cooperation (CPC)/IOC or government agencies give priority to the export-oriented manufacturers for the supply of diesel/furnace oil for the industry's operations. At present, most of the coconut-based industries have been affected due to this fuel shortage.

Recommendations:

1. Directly issue required fuel from CPC/IOC in rupees or USD for coconut processing industries – Implemented with the initiation of CRI.

2. Establish dedicated fuel supply stations in the coconut triangle to facilitate their needs or arrange fuel from CTB fuel stations – Implemented the proposal.

3. Expand the Coconut Research Institute fuel service state using industry funds and ensure a continuous supply of fuel for industry needs. For that Ministry of Plantation, Energy

Ministry and other respective agencies should facilitate and need to give approval. Coconut Processing industries are willing to fund the infrastructural developments.

Issue 2: Labour turnover is low due to the petrol shortage.

Recommendation:

Arrange a quota system considering the nature of the work of individuals including the essential service category.

Issue 3: Raw materials for coconut processing industries.

The processing industry faced a crisis situation in importing raw materials for their industries. Especially packaging materials such as polythene, containers and chemicals for lab tests.

Recommendation:

Allow importing of required industrial raw materials using their earnings.

Issue 4: A significant increase in the cost of machinery and spare parts.

The maintenance cost of machinery has gone up drastically due to the cost escalation of spare parts and machinery/equipment. This will contribute to the increase in the cost of production and will make our products non-competitive in the international market.

Recommendation:

Allocate tax concessions and allow industries to import their machinery and spare parts.

Issue 5: Limit the imports of edible oils with huge foreign exchange cost.

At present, a huge amount of foreign exchange is wasted on importing coconut oil by giving tax concessions. Coconut oil is a highly expensive edible oil in the international market which is imported to supplement the local edible oil demand.

Recommendation:

Remove the tax concessions for imported coconut oil and give an equal chance for all edible oils to compete in the local market. But imports should be controlled to protect the local coconut oil industry.

Issue 6: Transfer of foreign exchange earnings from processing industries to the country.

Transfer of foreign exchange earnings back to the country from export industries is very essential. Although Customs returns indicated the exported value, no mechanism has been established to monitor the transfer of foreign exchange earnings to the country which is very essential today.

Recommendations:

1. Establish a mechanism to monitor the transfer of foreign exchange earnings to the country.
2. Make compulsory the payment of half of the payments in dollar terms to the processing factories.
3. Allow indirect exporters to open USD accounts in commercial banks. Inform all the shippers to pay at least 30% of the invoice value in USD and the rate should be the CBSL buying rate at the time of raising the purchase order.
4. Central Bank should allow the transfer of at least 30% of export earnings to the processors and also establish a unit to monitor the amount of export examining transferred back to the country's accounts.

Issue 7: China free trade agreement.

China is a good market for coconut products. Already a free trade agreement has been drafted but according to the information received, only Coconut milk powder is included in the free trade agreement.

Recommendation:

Include coconut products to the agreement.

Issue 8: At present no priority has been given to the plantation sector in allocating services and benefits.

Recommendation:

Convert planation/agriculture sector as an essential service category.

Issue 9: Input shortage for coconut cultivation and escalating input prices, especially fertilizer.

Nutrient replacement is essential for coconut as most of the plant parts are removed from coconut trees continuously as nuts, fronds etc. According to the records, for over three years coconut growers are facing fertilizer shortages, especially Murrieta of Potash which is very essential as well as cannot be supplemented.

Recommendation:

Immediately make available the essential nutrients and give tax concessions for tools and machinery required for managing coconut lands. Also, ensure reasonable prices for nuts.

Issue 10: Allocation of funds to control white fly damage.

Recommendations:

White fly damage has spread to the areas of Kegalle and most areas of the Western Province. This damage should be immediately controlled to prevent the spread of the pest to other coconut-growing areas.

Research and Development Highlights

COCONUT VARIETAL IMPROVEMENTS

Development of potential inter- and intra- varietal hybrids using local and exotic varieties conserved at field gene banks

Genetics and Plant Breeding Division

Crop improvement through breeding is a process that never ends. Therefore, despite the seven improved cultivars produced, Sri Lanka Coconut Breeding Programme attempted further exploitation of coconut material conserved at field gene banks. In 2022, a novel hybrid production programme was initiated using several promising exotic and local coconut varieties.

Kar Kar Tall (KKT) and Makham Valley Tall (MKV) are two varieties that were brought to Sri Lanka from Papua New Guinea in 2003 as coconut embryos. The main characteristic of these two varieties is their larger nuts with more coconut kernel than those of ordinary varieties. KKT also has a potential to be used for tender nut production as it produces high amount of coconut water of superior quality. Therefore, KKT and MKV were used in this hybrid production programme as pollen donors.

Ran Thambili (RT) is a traditional coconut variety in Sri Lanka with favorable traits but underutilized in breeding programs. Therefore, RT was also selected as a pollen donor in the novel hybrid production program.

Fig 01. Hand pollination to produce hybrids with exotic varieties

Sri Lankan Green Dwarf (SLGD) and Sri Lankan Yellow Dwarf (SLYD) at the Isolated seed garden, Ambakelle are being used as the female parents in this breeding programme and six potential coconut hybrids are being produced. The six potential hybrids and expected trait improvements are shown below.

Table 01. Potential hybrids and expected trait improvements

	Cross / Hybrid	Expected trait improvement
1	SLGD × RT	Higher nut and copra production
2	SLYD × RT	
3	SLGD × KKT	Production of dual-purpose cultivar for beverage purposes and copra production
4	SLYD × KKT	
5	SLGD × MKV	Higher nut and copra production
6	SLYD × MKV	

Development of coconut cultivars tolerant to coconut mite

Genetics and Plant Breeding Division

Aceria mite (*Aceria guerreronis*) is one of the major pests that causes yield loss in the drier parts of coconut growing areas in Sri Lanka. Breeding coconut for tolerance/resistance to *Aceria mite* has been identified as a sustainable pest management option. Therefore, Genetics and Plant Breeding Division produced five new coconut hybrids namely, Sri Lanka Tall x Brazilian Green Dwarf (T x BGD), Gon thembili Tall x Brazilian Green Dwarf (GT x BGD), Brazilian Green Dwarf x Gon thembili Tall (BGD x GT), San Ramon Tall x Brazilian Green Dwarf (SR x BGD), Sri Lanka Yellow Dwarf x Gon thembili Tall (YD x GT) using diverse parents. These hybrids are being evaluated in the field for the last 13 years.

As reported in previous years, Sri Lankan Tall x Brazilian Green Dwarf (T x BGD) cross continued to show its superiority in terms of fewer mite incidence and higher nut yield in the year 2022. T x BGD reported the least mite incidence throughout the year compared to recommended coconut cultivars and maintained the mite incidence less than 20% except in the month of May. T x BGD has repeatedly shown a high potential as a mite tolerant coconut cultivar for a future recommendation and therefore, measures were taken to increase the cultivated extent of its male parent, Brazilian Green Dwarf. A self-pollination of this variety was continued and 26 self-pollinated seedlings were planted in the field gene bank.

Fig 02. Coconut mite infestation in coconut

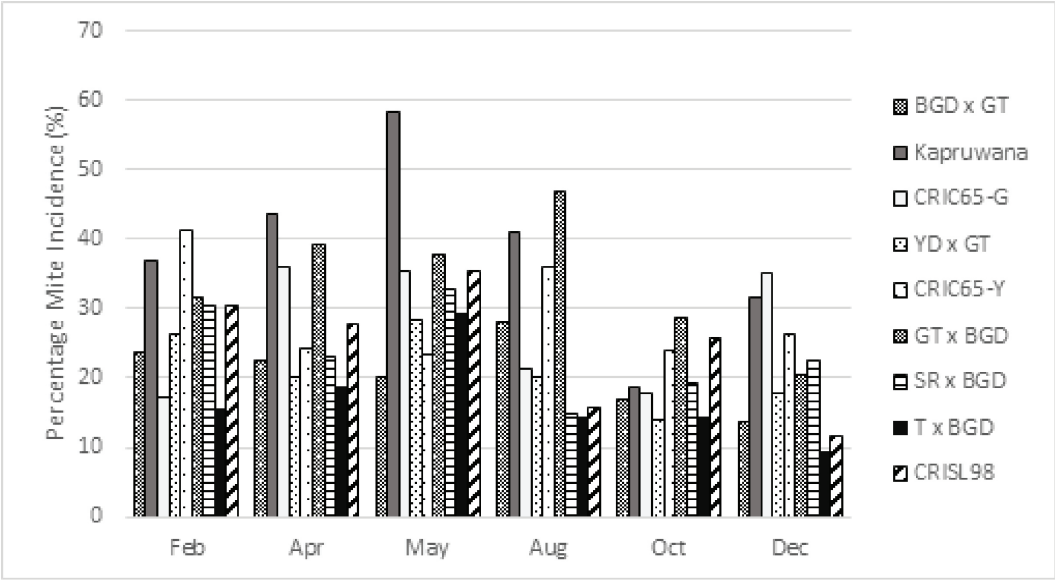


Fig 03. Percentage mite incidence of different coconut hybrids at the Sirigampola site uring 2022

Collection and conservation of local and exotic germplasm and utilization in breeding program

Genetics and Plant Breeding Division

1. Identification of morphological and molecular segregation of conserved F2 populations and deriving marker-trait associations

More than hundreds of local and exotic coconut varieties, accessions and populations have been conserved in field gene banks at different estates of the Coconut Research Institute of Sri Lanka. In addition to the conservation purpose, these populations can be used for different genetics studies. Segregating populations such as F2 populations are important to derive marker trait associations that can be utilized in marker assisted breeding.

In this study, two F2 populations, Green Dwarf x Yellow Dwarf and Red Dwarf x Brown Dwarf, conserved at Middeniya Research Centre were characterized phenotypically for 16 quantitative traits and genotyped with 6 microsatellite markers.

The results revealed the two populations to be highly segregating and appropriate for deriving marker-trait associations. Therefore, single marker analysis was carried out to derive marker trait associations. Several important phenotypic traits showed statistically significant marker-trait associations and the associations are shown in Table. These marker-trait associations are mainly related with Leaf morphology and subsequently the photosynthetic capacity that primarily decides the nut yield and growth of the palm. Therefore, identified association can be used in marker assisted breeding of coconut. However, studies are needed to identify the contribution of each of these markers to the total variation of important traits.

Table 02. Significant marker-trait association identified through single marker analysis

Microsatellite marker		Associated phenotypic trait
01	CnCirB12	Number of bunches
		Number of leaflets
		Leaflet length
		Petiole width
02	CnCirC3	Petiole length
03	CnCirE10	Leaflet length
		Petiole width
		Petiole length
04	CnCirG11	Pollination behavior

2. Establishment of a field pollen bank

Sri Lanka Brown Dwarf (SLBD) and Malayan Red Dwarf (MRD) that are used in commercial hybrid production, are rare coconut varieties in Sri Lanka. SLBD is the male

parent of CRICSL2012 and CRISL2013 (Kapsuwaya and Kapsetha) while the exotic variety MRD is the male parent of CRISL2020. Brazilian Green Dwarf has been successfully utilized in breeding programme and its hybrid with Sri Lanka Tall shows promising results for Aceria mite tolerance. Therefore, to strengthen the hybrid seedlings production of these crosses, sufficient numbers of male parents are needed to collect pollen. Hence, a field pollen bank was established at Bandirippuwa Estate. As an Initial step, 14 seedlings from MRD, 26 seedlings from BGD and 35 seedlings from SLBD that were produced by self-pollination were planted in the field pollen bank.

Induction of somatic embryogenesis and plant regeneration in ovary derived callus

Tissue Culture Division

An experiment was conducted to evaluate the effect of added Glutamine in ovary culture medium on callus initiation, multiplication and shoot regeneration. Three concentrations of Glutamine (0.1g/l, 1g/l, 2.8g/l) were incorporated to the callus initiation medium, callus multiplication medium and somatic embryo germination medium. The highest number of shoots was obtained in the media containing 2.8g/l of Glutamine. A considerable number of cultures were deteriorated at different stages due to COVID 19 lock down. However, about 500 clonal shoots could be regenerated during the period. During the year, 60 ovary derived clonal plants were acclimatized and previously acclimatized 40 tissue culture plants were field planted. About 40 more plants are ready for field planting. Establishment of field trial at Bandirippuwa Estate was completed and a new field experiment was initiated at Devithura Estate of Elpitiya Plantations PLC.

Identification of new explants for vegetative propagation of coconut

Tissue Culture Division

The potential of using tender leaf as an alternative explant for coconut micropropagation, tender leaf segments was evaluated by culturing them in different media compositions. Leaf segments of embryo cultured plants were used initially for experiments, with the purpose of developing a protocol for leaf explants from ovary culture derived clonal plants. Few explants produced calli on 400µM 2,4-D medium and few calli segments produced shoots. Globular bodies (embryoids) were observed in explants cultured on 400µM 2,4-D containing medium. Few embryoids germinated and produced shoots. Generated shoots were transferred into the root initiation media.

Fig 04. Plantlets obtained from leaf culture in root induction medium

In vitro and biochemical approach to investigate somatic embryogenesis and tissue culture responsiveness in coconut

Tissue Culture Division

The experiment was initiated to study the biochemical and histological variation associated with somatic embryogenesis and tissue culture responsiveness in coconut. Explant browning at culture initiation is the most prominent draw back in coconut tissue culture. Tissue browning is a consequence of polyphenol oxidation which is occurred during dissection of tissues to initiate cultures. Therefore, experiments were initiated to analyze polyphenol contents in coconut ovary tissues.

Different antioxidants (PVP and Polyamide) in different concentrations and combinations were added to callus initiation medium of ovary culture protocol with the objective to increase the success of culture initiation through reducing tissue browning. Treatments used were activated Charcoal (0.1%), PVP (0.1%), Polyamide (0.05%) and PVP (0.1%) with Polyamide (0.05%). Compared to the control (0.1% Charcoal), browning incidence was lower with PVP (0.1%) and PVP (0.1%) and Polyamide (0.05%). However, the additional antioxidants reduced the callus formation. Further studies are needed to develop a protocol to produce calli with antioxidants while reducing the browning of tissues.

Investigation of genotypic specificity in coconut shoot tip culture protocol

Tissue Culture Division

In order to develop a new protocol for coconut palm through axillary shoot multiplication, shoot tip meristems obtained from in vitro grown (embryo cultured) coconut seedlings were cultured in Y3 medium fortified with 1µM TDZ at 270C with 18h/16h light cycle. Few numbers of proliferating meristem clumps were obtained and a few shoots were regenerated.

Fig 05. Shoot regeneration through axillary shoot multiplication

COCONUT PRODUCTION TECHNOLOGY

Development of sustainable moisture conservation method by using bio-char for mature coconut plantations

Agronomy Division

A consistent supply of moisture throughout the year is crucial for growth and nut yield of coconut. This study intended to establish a biochar-based approach for maintaining soil moisture in coconut plantations in dry and intermediate zones of the country. Biochar was made using Gliricidia sticks inside a modified kiln under a minimum supply of oxygen.

Fig 01. Experimental field at Nagansole Estate at Rasnayakapura.

Results of the study revealed that applied quantity of biochar has not contributed to increase the nut yield considerably ($P>0.05$) even 6 and 7 years after the treatment application. Therefore, study was concluded with the inference that the application of 10 to 15 kg of biochar was insufficient to boost the nut yield. Hence, it is necessary to test the higher rate of biochar application to find the effect on moisture retention.

The important observation of this experiment was that the significant improvement of soil aggregation formation (P<0.05) seven years after the biochar application at high rates (15 kg and 10 kg), compared to those of the control and the coconut husk applied treatment. This demonstrates that biochar application promotes soil aggregation in sandy soil by binding organic matter and mineral particles. This will create favorable environment for the coconut palms.

Table 01. Nut yield of coconut palms after the application of the treatments from 2016 to 2022 (N=15).

Treatments	Nuts/palm/year						
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
15kg BC	64	41[a]	41	83[a]	69[a]	88	40
10kg BC	57	45[a]	38	71[b]	59[ab]	86	36
5kg BC	65	36[ab]	33	69[b]	55[b]	82	37
Coconut Husk	64	37[a]	35	62[b]	51[b]	74	36
Control	57	26[b]	32	62[b]	46[b]	71	27
P value	0.48	**0.09**	0.58	**0.04**	**0.07**	0.21	0.42
CV	30	42	47	16	19	33	44

Means with the same letter are not significantly different at p<0.1; BC-Biochar

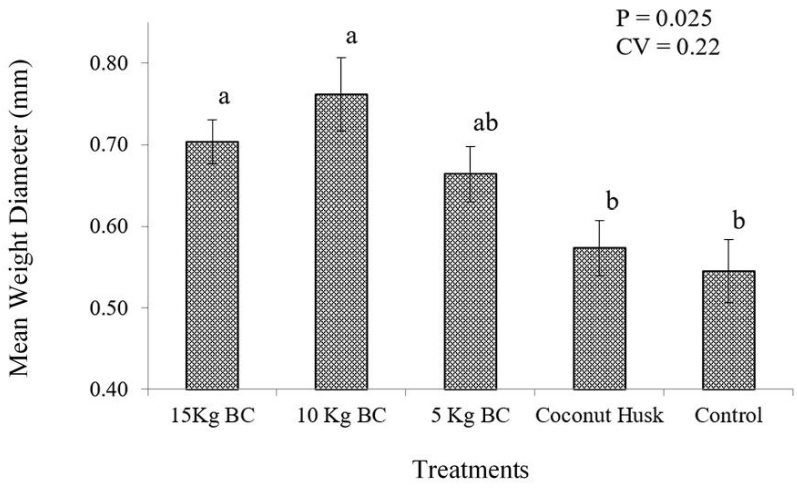


Fig 02. Mean weight diameter of soil aggregates after 7 years of treatment application

Development of sustainable moisture conservation method by using bio-char for young coconut plantation

Agronomy Division

This research was conducted to develop a biochar-based soil moisture conservation approach for coconut seedlings in the Dry and Intermediate Zones and to determine the optimal biochar application method for coconut seedlings during establishment. Two percent (2%) of biochar (w/w) (24kg) was applied during the seedling establishment as a replacement for coconut husk to preserve moisture and nutrients. Biochar was produced from Gliricidia sticks using a Double-chamber pyrolizer built at the Rathmalagara estate in Madampe. The treatment plan of the experiment is shown below.

One year after biochar application (2021), no significant difference was observed in soil moisture content at the top 30 cm soil between coconut husk amended pit and biochar amended pits. However, two years after the treatment application (2022), a substantial increase ($P<0.1$) in soil moisture content was observed in biochar mixed with the whole soil volume compared to that of the control, which had no external material applied to conserve soil moisture. The soil moisture content was numerically greater in the 24kg biochar layer placed at the bottom of the planting pit and the same biochar content incorporated with the entire soil volume.

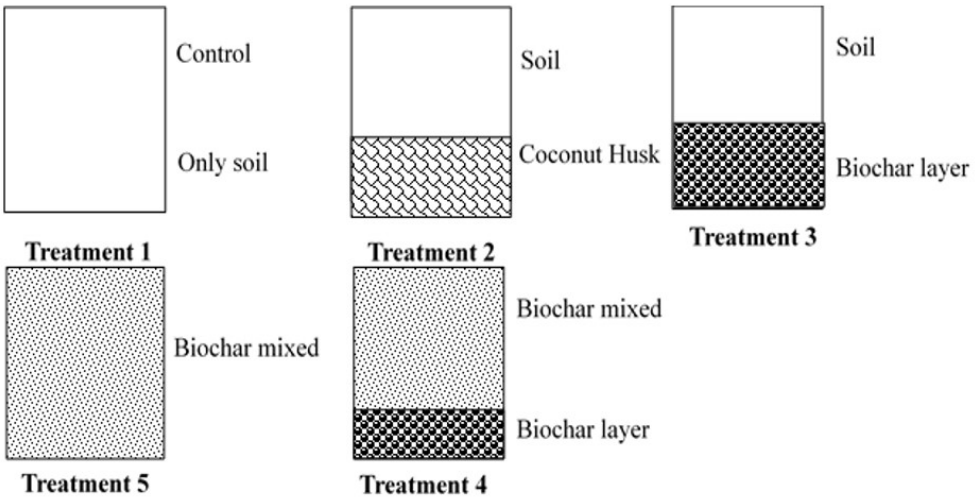


Fig 03. The treatment plan for different applications

Table 02. The soil moisture content of different treatments at 0–30cm depth (N=15).

Treatment	Soil Moisture % at 0-30 cm depth	
	2021	2022
Control	5.03	2.61[b]
Coconut husk	4.67	2.87[ab]
Biochar BL	5.69	3.59[a]
Biochar BL+MX	5.40	2.72[ab]
Biochar MX	5.86	3.65[a]
P value	**0.14**	**0.09**
CV	0.31	0.46

Means with the same letter are not significantly different at $p<0.05$; BL-Biochar Layer; MX-Biochar mixed

Seedling height was not significantly different among the treatments after 1 year of seedling establishment. The rest of the growth parameters (Girth and Leaf Initiation) were not significantly different among the treatments even 2 years after the treatment application. Experiment is in progress.

Table 03. Seedling height one year after treatment application and seedling girth and leaf initiation one and two years after treatment application (N=15).

Treatments	Seedling height (cm)		Seedling girth (cm)		Leaf initiation	
	2020	2021	2021	2022	2021	2022
Control	167	237	24	50	1.7	4.7
Coconut Husk	150	209	20	39	1.9	4.6
Biochar BL	157	195	20	47	1.8	4.5
Biochar BL+MX	158	244	21	55	1.8	5.1
Biochar MX	169	214	22	36	2.1	5.2
P Value	**0.106**	**0.364**	**0.361**	**0.741**	**0.420**	**0.290**
CV	12	12	0.17	24	27	17

Identification and evaluation of new mulching material on soil moisture conservation and the growth of coconut seedlings

Agronomy Division

The growth and production of coconut palms depend on a regular supply of water.

Coconut is usually cultivated under rain-fed conditions and soil moisture stress during dry periods is a crucial problem. Mulching the manure circle of the palms and seeding with different plant materials and husk burial are the common soil moisture conservation methods practiced in coconut plantations. The availability of planting materials for mulching is becoming scarce due to the high demand as they are raw materials in many agricultural and industrial products. Thus, it was aimed to evaluate the effect of commercially available modified polythene mulches on soil moisture conservation and growth of coconut seedlings, compared to the conventional mulching materials.

Soil moisture content under different mulching materials was measured one and two years after the treatment application (2021 and 2022). There was a significant difference among treatment in the topsoil (0-15cm) and the subsoil (15–30 cm) in 2021 but with no such difference in the moisture content of the deep soil (30-45 cm). However, two years after the application of treatments, no significant differences were observed on moisture content among treatments at any soil depth.

Table 04. Effect of different mulches on soil moisture content in the manure circle

Treatment	Moisture % (Dry Basis)					
	0-15cm		15-30cm		30-45cm	
	2021	2022	2021	2022	2021	2022
No mulch	6.31^{ab}	2.74	6.85^{b}	2.83	5.89	2.71
Coconut fronds	7.22^{a}	2.7	8.07^{a}	3.49	7.55	3.24
Coconut husks	5.96^{ab}	2.94	7.32^{ab}	2.8	7.85	3.21
Mulching mat	6.35^{ab}	2.74	7.38^{ab}	3.31	8.35	3.61
Mulching film	5.57^{b}	3.19	7.25^{ab}	3.44	7.82	3.75
p-Value	0.016	0.671	0.013	0.223	0.099	0.147
CV	23.76	27.17	14.55	26.37	27.29	28.54

Means with the same letter are not significantly different at $p<0.05$

The effect of different mulching materials on the organic carbon content was significantly different only in the topsoil but not at other depths. The results of the microbial respiration measured in top soil indicated that the effect of the mulching materials on microbial activity was not significant and it indicates that the possibility to using alternative mulching materials.

Table 05. Effect of different mulches on soil organic carbon content and the microbial activity in the manure circle

Treatment	Organic Carbon Content (%)			Microbial Activity ($\mu g\ CO_2\ g^{-1}day^{-1}$)
	0-15cm	15-30cm	30-45cm	
No mulch	0.47^{ab}	0.38	0.39	43.02
Coconut fronds	0.50^{ab}	0.36	0.43	49.63
Coconut husks	0.44^{b}	0.36	0.32	47.6
Mulching mat	0.62^{a}	0.39	0.54	47.44
Mulching film	0.50^{ab}	0.44	0.41	46.6
p-Value	0.045	0.552	0.519	0.94
CV	32.42	35.68	41.73	37.91

Means with the same letter are not significantly different at $p<0.05$

One year after treatment application, there was a significant difference between mean values of the height, girth and leaf initiation in seedlings grown under different treatments. However, two years after application, significant differences were observed only in seedling height and girth of different treatments. At the end of the second year, the trend of seedling height was; mulching film > mulching mat > coconut husk > coconut frond > no mulch, while the trend of seedling girth was mulching film > mulching mat > coconut husk > no mulch > coconut frond. However, there was no effect of different mulches on the leaf initiation two years after application.

Table 06. Effect of different mulches on the seeding height, seedling girth and leaf initiation

Treatment	Seedling Height (cm)		Seedling Girth (cm)		Leaf Initiation	
	2021	2022	2021	2022	2021	2022
No mulch	167.05^{b}	332.74^{b}	42.60^{ab}	73.82^{b}	6.10^{ab}	5.98
Coconut fronds	175.21^{ab}	333.35^{b}	37.65^{b}	70.93^{b}	5.95^{ab}	5.80
Coconut husks	193.81^{ab}	361.88^{ab}	52.27^{a}	79.93^{ab}	5.57^{b}	5.64
Mulching mat	203.52^{a}	366.97^{ab}	48.23^{a}	79.95^{ab}	6.63^{ab}	5.17
Mulching film	201.16^{a}	401.44^{a}	52.00^{a}	87.24^{a}	7.12^{a}	4.99
p-Value	0.001	0.016	0.001	0.008	0.022	0.075
CV	15.52	17.22	21.93	16.49	20.52	20.41

Means with the same letter within each column are not significantly different at $p<0.05$

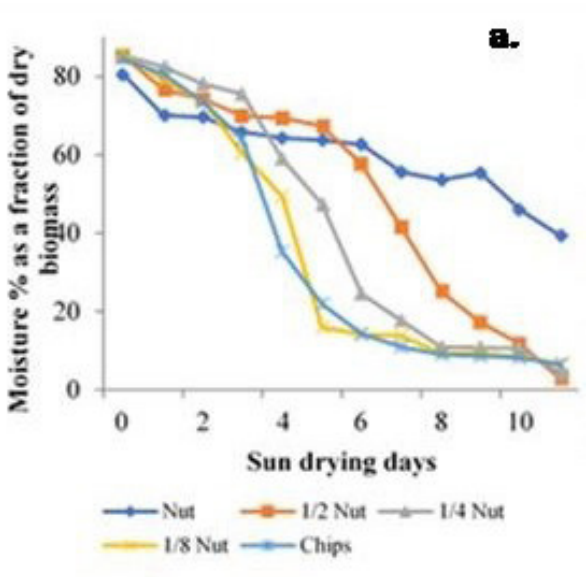
Development of a sustainable approach to utilize king coconut husk as a potassium fertilizer source and a soil amendment

Agronomy Division

King coconut husk has posed a significant environmental risk and has been linked to a range of documented health issues. The factories that bottle king coconut water for export generate substantial quantities of king coconut husk. Because of its low market value, this trash is currently buried in coconut lands. If this readily available solid waste could be transformed into a sustainable soil amendment and fertilizer in an environmentally conscious manner, it would be productive and environmentally friendly.

Preparing biochar is one method for the efficient exploitation of organic waste that delivers additional benefits. Therefore, this project intended to develop a medium-scale, auto-combustion, double-chamber pyrolizer capable of producing high-quality biochar with minimal external inputs. This research project is a collaboration between the SILVERMILL Group of Companies and the Coconut Research Institute to successfully utilize king coconut husk.

A preliminary study was carried out to investigate the drying pattern of fresh king coconut husks. Different cut sizes of shells were sun-dried to determine the best cut size for biochar production with minimum labour. The quickest rate of drying was observed when shells were made into 1/8th of a husk cut size and chips, followed by 1/4th of a husk > ½ of a husk > full husk. When mechanically dried using an oven or a dehydrator at 60ºC, it can reach the desired dryness within 24 hours.



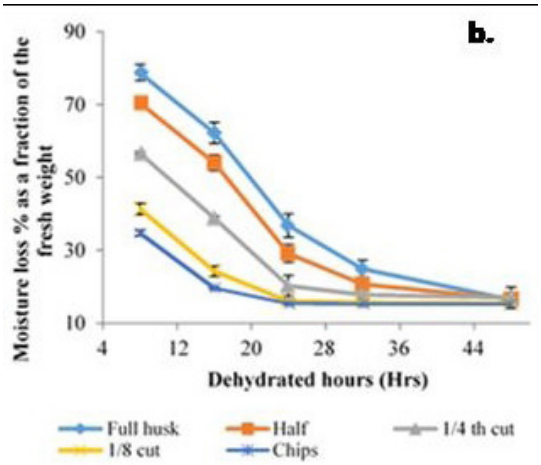


Fig 04. Rate of moisture loss (a) during sun drying and (b) oven drying of cut sizes of king coconut husk (N=3)

A Mini Pyrolizer was developed to produce biochar and ash using king coconut husk as the fuel and the feedstock. Performance of the Pyrolizer was evaluated using the 1/4th cut of dried king coconut husk as the feedstock and ½ cut of dried king coconut husk as the fuel. The optimum feedstock-to-fuel ratio for pyrolysis was found to be 1:2 ratio.

Fig 05. Biochar production at Rathmalagara Research Center (a) Mini Pyrolizer, (b) 1/4th cut size of king coconut husk as the feedstock and (c) Produced biochar from king coconut husk.

The biochar recovery rate was 14.0% as a component of the total biomass while it was 40.2% as a fraction of the feedstock. Ashes were recovered at the rate of 7.1% of the total biomass and it was 10.8% as a fraction of the feedstock.

Quantification of below ground carbon stock and development of an allometric model to estimate the variation of below ground carbon stock of coconut palms in different age groups and in major land suitability classes

Agronomy Division

The productivity of the agriculture sector is one of the key-worldwide challenges that is impacted by the climate change. Yet, the plantation industry has a significant potential to adapt to offset the effects of climate change. Being a perennial plantation crop, coconut can sequester more atmospheric Carbon and store comparatively for longer time duration, more than five or six decades. Hence, a Carbon accounting model that reflects carbon sequestration potential is very much a timely requirement. Estimating Carbon stocks in trees through destructive sampling is costly and practically challenging, especially when dealing with numerous species and large sample areas. In order to predict biomass using some easily quantifiable predictor factors, such as tree diameter and the total height, models are being employed as an alternate strategy.

This experiment was designed to estimate the actual below ground dry mass and Carbon stock of coconut palms concerning different ages and land suitability classes and to develop a methodology and allometric model that would elaborate the relationship with above-ground parameters to estimate the below ground Carbon stock of coconut stands. Coconut stands belonging to age groups of 10, 20, 30, 40 and 50 years were selected from Ambakele Isolated Seed Garden under major soil suitability classes S1, S2, S4 and S5. From each age category, 9 palms were selected in each land suitability class, and 1/8 of the root zone of each palm was excavated for sampling.

Fig 06. Root excavation pits at Ambakelle estate, Fig 07. Measuring diameter at breast height (DBH)

The diameter of the stem at breast height (DBH), the height of the stem, fresh weight of the roots, dry weight of the roots, Carbon content of the roots, soil physical, chemical and biological parameters and nut yield were recorded according to the experimental plan. The amounts of Carbon stocks in the roots showed an increasing trend across age groups from 10 to 50 years. With the help of height and DBH, the allometric relationship was developed to estimate the amount of Carbon stocks in the roots of the entire palm.

The formula of the allometric equation between the DBH and root Carbon stock was Y = 0.0067X – 0.4837 (where X is DBH) with R2 = 0.8369. Furthermore, the allometric equation for the relationship between plant height with root carbon stock was Y = 0.0074X + 0.0035 (where X is palm height) with R2 = 0.9246. With reference to the R2 values, the allometric relationship between root Carbon stock and palm height (R2 = 0.9246) was identified as the well represented relationship for determining the root Carbon stock non-destructively.

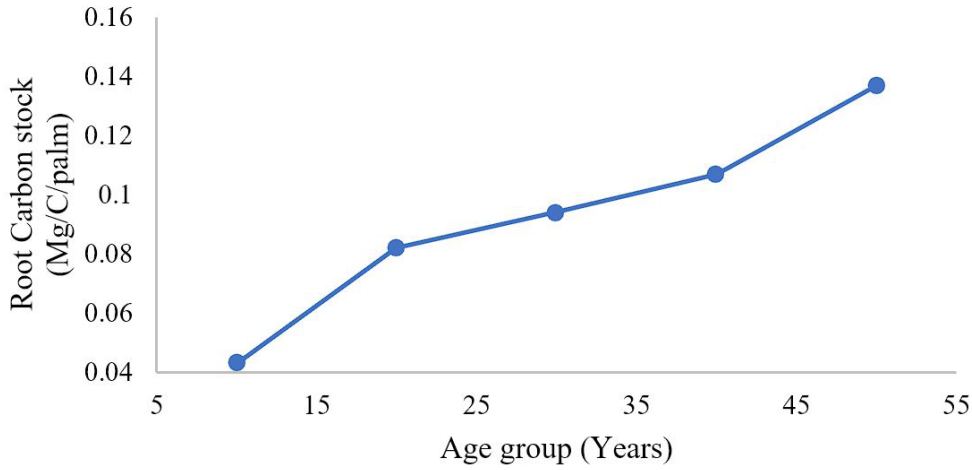


Fig 08. Variation of the carbon stock of roots with the age of palm

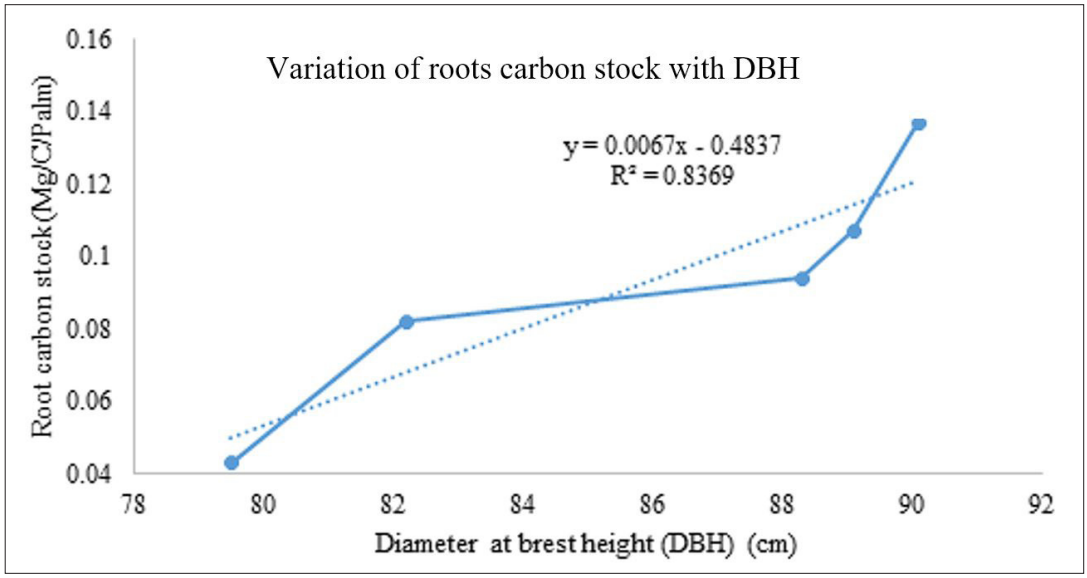


Fig 09. Variation of roots carbon stock with DBH

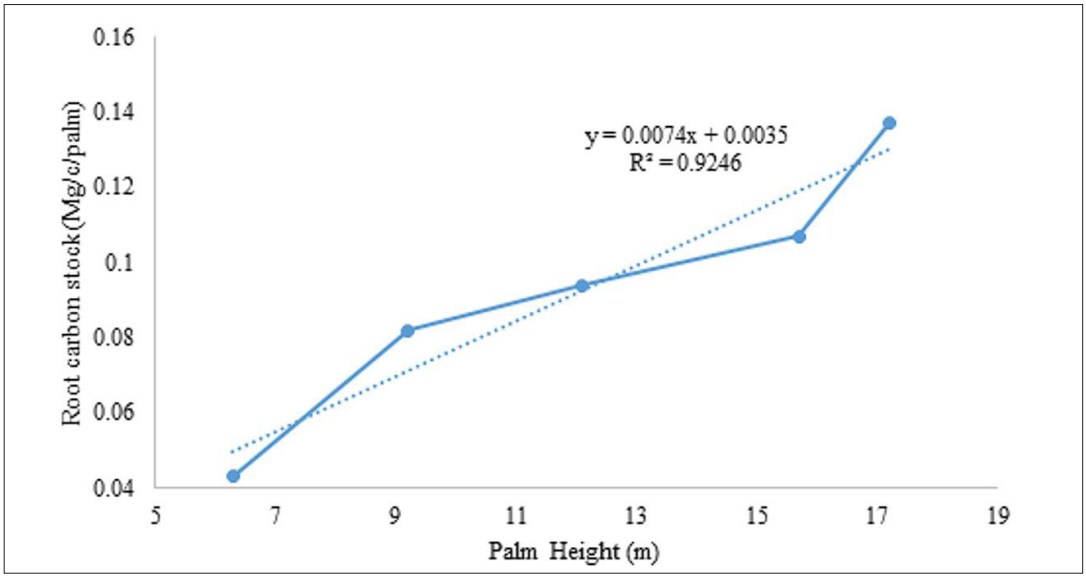


Fig 10. Variation of root carbon stock with palm height

Evaluating the effect of micronutrients on the growth and performance of coconut seedlings

Agronomy Division

Out of the two fertilizer sources, inorganic and organic, the application of inorganic fertilizer is the most common technique of fertilizing coconut palms used to provide macronutrient requirements. Micronutrient fertilizers are gaining popularity and will significantly bring stability and sustainability to agricultural yields in the coming decade. It has been observed that micronutrients, which are necessary to plant growth, induce disease-resistant mechanisms in plants. However, in the Sri Lankan context, micronutrient treatment of coconut palms is not currently practiced.

The present study was carried out to evaluate the effect of a commercially available micronutrient fertilizer mixture on the performance of adult coconut palms. According to a complete randomized block design, this experiment was established at the Isolated Seed Garden, Ambakelle. Palms were treated with four different rates (T1=0g, T2=100g, T3=140g, T4=180g and T5=220g) of commercially available micronutrient fertilizer mixtures based on the micronutrient removal of adult coconut palms. There was no significant difference (P>0.05) in nut yield among the treatments one and two years after the addition of the micronutrient mixture (2021 and 2022) into the manure circle of adult coconut palms.

Table 07. Treatment details and nut yield data 1 and 2 years after the treatment application (2021 & 2022)

Treatment	APM	Dolomite	Micronutrient fertilizer mixture (g/palm)	Annual nut yield in 2021	Annual nut yield in 2022
T1	CRI Recommended Fertilizer Dose		0	62.35	63.55
T2			100	76.96	63.14
T3			140	73.86	61.78
T4			180	66.30	56.17
T5			220	79.23	67.20
CV				49.14	43.73
SD				35.23	27.22
Sig.				**0.442**	**0.764**

CV=Coefficient of variance, SD=Standard Deviation, Sig.=Significance

No significant differences were observed in macro and micronutrient contents in the soil under different treatments at P < 0.05 except the Fe. Moreover, no association was observed between yield and the different application rates of micronutrient fertilizer. This indicated that this soil contained sufficient micronutrients to meet the palm demand, as it was already covered with cover crops.

Table 08. Soil macro and micronutrient contents at 0-15 cm soil depths 2 years after the treatment application

	P [%]	S [ppm]	Zn [ppm]	Cu [%]	B [ppm]	Mn [ppm]	Fe [%]	Mg [%]	Ca [%]	Na [%]	K [ppm]
T1	0.224	148	17.	5.3	4.8	90	0.300	0.249	0.599	48.9	197
T2	0.243	145	20	5.3	3.4	79	0.232	0.325	0.768	41.6	145
T3	0.262	178	26	7.3	4.9	99	0.271	0.260	0.628	49.2	224
T4	0.199	138	29	8.1	2.4	75	0.196	0.183	0.475	40.8	135
T5	0.202	142	30	7.2	2.0	67	0.168	0.256	0.565	35.7	137
CV	0.30	0.30	0.70	0.71	0.58	0.34	0.32	0.47	0.45	0.31	0.40
Sig	0.68	0.61	0.76	0.92	0.08	0.64	0.03	0.68	0.72	0.54	0.18

P=Phosphorous, S=Sulphur, Zn=Zinc, Cu=Copper, B=Boron, Mn=Manganese, Fe=Iron, Mg=Magnesium, Ca=Calcium, Na=Sodium and K=Potassium/, ppm=parts per million, CV=Coefficient of variance, Sig.=Significance

This experiment was conducted in S1 soil (Madampe series) with high organic matter contents. Hence, the application of micronutrient fertilizer may not be essential on S1 series soils with high organic matter content.

Development of biochar-based Potassium-enriched (K-enriched) fertilizer brick for adult coconut palms

Agronomy Division

Biochar is an amendment used in agricultural lands to enhance soil fertility and retain nutrients and moisture. This is an organic material obtained from the pyrolysis process at low or zero oxygen conditions.

An adult coconut palm needs at least 30kg of biochar to meet the minimum potential productivity in the growth and development of the palm. This application rate of biochar on the coconut manure circle surface is voluminous and could be lost with runoff water due to low particle density. Very low particle sizes may cause health hazards in handling bulk quantities of biochar and are easily subjected to wind loss. Application of this type of fertilizer in a form of a brick with a recommended number of bricks per year will ease laborious fertilizer application in coconut cultivation while providing several benefits to the plant and the environment. Therefore, this experiment was designed to develop a cost-effective Biochar-based K-enriched fertilizer brick for adult coconut cultivation.

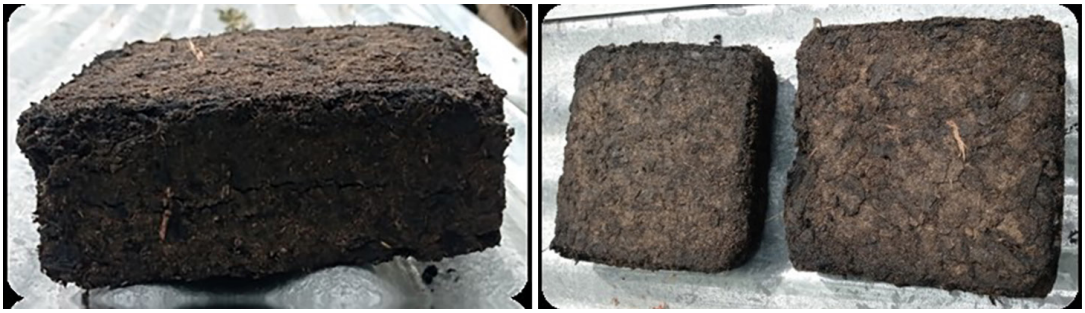


Fig 11. Formulated biochar-based fertilizer brick

The initial biochar composite was characterized by its total Nitrogen (N), Phosphorous (P) and Potassium (K) content. Using four chosen binding materials, 17 x 17 x 6 cm3 biochar bricks were manufactured. The dry density of bricks ranged between 0.300–0.350 gcm-3. Based on the results of brick strength, two high-performing binding materials were selected out of the four materials evaluated, for the next stage of the experiment.

Table 09. Total nitrogen, phosphorous and potassium contents of brick mixture.

	TN %	TP %	TK %
Biochar	1.05	0.03	1.51
Brick composite	1.33	0.03	0.75

TN=total nitrogen, TP=total phosphorous, TK=total potassium

Growth performance evaluation of high-value resin crops under coconut

Agronomy Division

Coconut-based agroforestry is one of the strategies for increasing return per unit of land area while improving resource utilization and land productivity. The rationale for intercropping on coconut lands is to maximize crop production per unit of land and time without causing any adverse effects on coconut yields. Spaces under mature coconut plantations over 25 years, vacancies of mature coconut stands and non-cropping areas can be utilized with resin crops as an intercrop in low densities. International demand for natural plant resins is increasing and over the past decade, it has resulted in over-exploitation and illegal trade of resin crops or their products. Plant resins are highly priced plant products that can be used in fragrances, incense, medicines, aromatherapy and religious ceremonies.

This study was conducted at Makandura Research Center, Makandura to evaluate the growth performance of selected resin crops under coconut. Established resin crop species were White sandalwood (Santalum album), Wallapatta (Gyrinops walla) and Red Sandalwood (Pterocarpus santalinus). The above resin species were planted in the centre of the squire with 4 x 4m spacing.

Fig 12. Collection of plant growth parameters of resin crop species

By using the plant parameters such as plant height and the basal diameter, life span of the resin crop with economic value under coconut can be predicted. Thus, the present experiment was started in 2018 and the time that would take to get an economic value was calculated using the growth data obtained from 2018 to 2021. When it was calculated using the growth rate of plant height in the trendline equation, it showed 16 years for the white sandalwood, 12 years for the wallapatta and 07 years for the red sandalwood. Furthermore, when considering the basal diameter of the plants, it showed 14 years for white sandalwood, 08 years for wallapatta and red sandalwood to get an economic value under coconut.

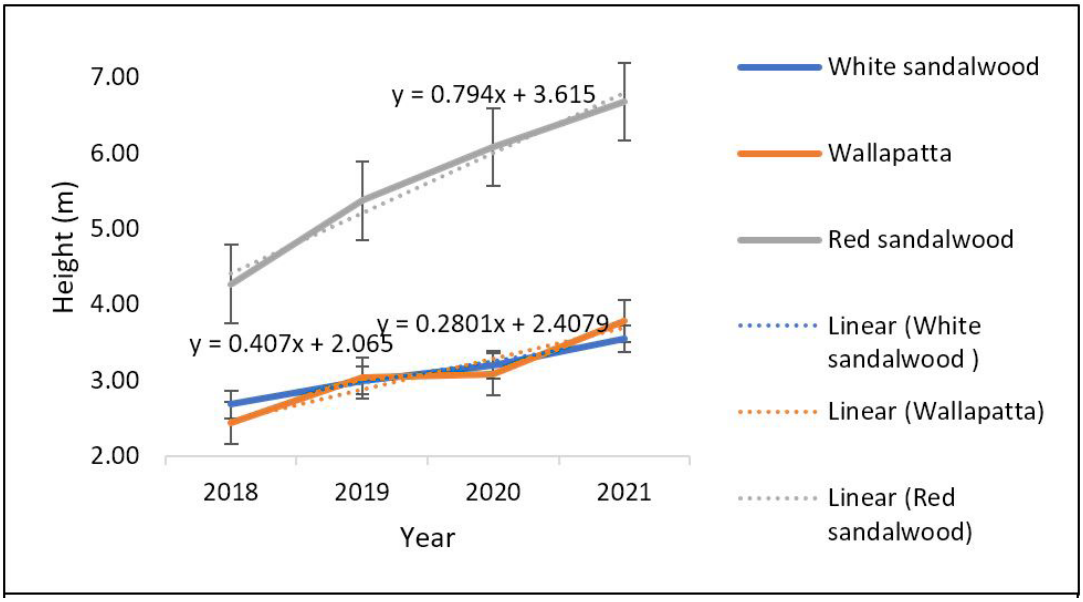


Fig 13. Variation of plant height from 2018 to 2021

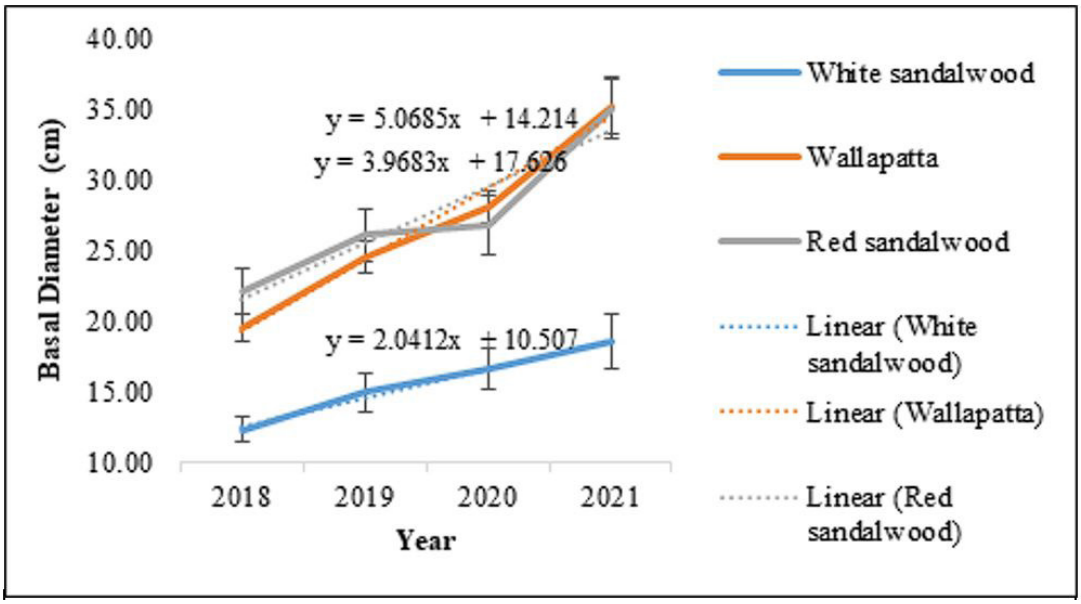


Fig 14. Variation of basal diameter from 2018 to 2021

Investigating the Alternative Uses of *Panicum maximum* (Guinea Grass)

Agronomy Division

Panicum maximum, which was introduced to Sri Lanka in 1820s as a forage, had naturalized in ecosystems within the country during the past few decades and is currently considered as a problematic invasive weed. Many coconut plantations have been invaded by Guinea grass disturbing the routine practices of the plantations, thereby increasing the cost of production.

However, as this is considered a valuable forage in many other countries and a raw material to produce organic soil amendments, this study was conducted to evaluate the feasibility of using Guinea grass as a raw material to produce compost, vermicompost and cattle feed by estimating the nutrient composition at different harvesting intervals.

The leaf nutrient contents were measured at different harvesting intervals to understand the changes in the leaf nutrients with the maturity of the plants. All the measured parameters, N%, P%, K%, Ca%, and Mg%, have decreased with the increasing maturity of Guinea grass.

Table 10. Leaf nutrient content of Guinea grass at different growth stages

Treatment	Leaf Nutrient Content (Dry Weight Basis)				
	N%	P%	K%	Ca%	Mg%
4 weeks growth stage	1.49^{a}	0.29^{a}	3.16^{a}	0.571^{a}	0.451^{a}
6 weeks growth stage	1.16^{b}	0.27^{a}	2.52^{b}	0.558^{a}	0.388^{ab}
8 weeks growth stage	1.09^{bc}	0.25^{abc}	2.20^{bc}	0.478^{ab}	0.368^{bc}
10 weeks growth stage	0.99^{c}	0.21^{bc}	2.12^{bc}	0.433^{ab}	0.343^{bc}
12 weeks growth stage	0.71^{d}	0.19^{c}	1.91^{c}	0.429^{b}	0.322^{c}
p-Value	<0.000	<0.000	<0.000	0.006	<0.000
CV	28.92	43.18	27.51	23.09	18.04

Means with the same letter within each column are not significantly different at $p<0.05$

The highest available leaf nutrient of Guinea grass was potassium and therefore can be used as a raw material to produce organic fertilizer for coconut plantations and can be utilized as green manure. However, further studies are required to understand the decomposition pattern of Guinea grass when applied as green manure and its impact on the coconut palm and soil properties.

Based on the leaf nutrient data, compost and vermicompost were produced using Guinea grass, following the recommended guidelines. Guinea grass with 70% -75% moisture content was mixed with cow dung with 80%-90% moisture content in a 1:3 ratio on a weight basis to facilitate decomposition as Guinea grass has comparatively higher fibre content and requires more time for decomposition. All compost and vermicompost samples were harvested 10 weeks after the exposure for decomposition.

No significant differences were observed between the mean values of nitrogen, potassium, and organic carbon contents and C:N ratio of the compost produced using Guinea grass harvested at different growth stages. However, a significant difference was observed in the mean values of the phosphorous contents and the highest was recorded in the compost produced using Guinea grass harvested at 10-week growth stage. The highest production efficiency was recorded from the compost produced using six weeks old grasses. All the measured nutrient parameters have met the minimum requirement of the SLSI and therefore any growth stage of Guinea grass before its flowering can be recommended to use as a raw material to produce compost.

Table 11. Nutrient composition and production efficiency rate of produced compost

Treatment	N%	P%	K%	OC%	C:N Ratio	Production Efficiency %
4 weeks growth stage	1.99	0.53^{b}	2.35	20.49	10.36	14.75^{c}
6 weeks growth stage	1.82	0.63^{ab}	2.53	22.55	12.77	22.28^{a}
8 weeks growth stage	2.30	0.42^{b}	2.28	22.99	10.82	19.09^{ab}
10 weeks growth stage	1.98	0.80^{a}	2.47	23.33	11.78	16.81^{bc}
12 weeks growth stage	1.62	0.63^{ab}	1.83	23.79	14.89	13.15^{c}
p-Value	0.181	0.006	0.148	0.624	0.336	<0.001
CV	19.34	27.38	16.90	13.34	25.45	21.09
Requirements according to the SLSI						
	1.00	0.22	0.83	20.00	10-25	

Means with the same letter within each column are not significantly different at p<0.05, OC=Organic carbon, C:N=Carbon:Nitrogen

No significant differences were observed between the mean values of all parameters tested in vermicompost produced using Guinea grass harvested at different growth stages. The highest production efficiency was recorded from the vermicompost produced using eight-week old grasses. All the measured nutrient parameters have met the minimum requirement of the SLSI and therefore any growth stage of Guinea grass before its flowering can be recommended to use as a raw material to produce vermicompost.

Panicum maximum harvested at different growth stages were analyzed for their crude protein (CP), crude fibre (CF) and ash contents to estimate its fodder quality. Dry matter yield was calculated for each growth stage. Crude protein, crude fibre and ash contents have decreased significantly with increasing maturity, while the dry matter yield has increased significantly. The average weight was given to the above four parameters to identify the best growth stage for using P. maximum as fodder. Based on the resulting index value, P. maximum can be recommended to be harvested at eight weeks of growth stage to be used as fodder.

Table 12. Dry matter yield, Crude protein, Crude fibre, and Ash content of P. maximum at different growth stages

Treatment	Dry matter yield (Mt/ha)	CP%	CF%	Ash%	Index
4 weeks growth stage	0.84^{b}	9.32^{a}	36.39^{c}	9.40a	2.00
6 weeks growth stage	1.01^{b}	7.28^{b}	38.40^{b}	9.28a	2.06
8 weeks growth stage	**1.52^{ab}**	**6.82^{bc}**	**38.62^{ab}**	**8.03ab**	**2.16**
10 weeks growth stage	1.80^{a}	6.22^{c}	38.38^{b}	7.76b	2.09
12 weeks growth stage	1.89^{a}	4.53^{d}	39.63^{a}	7.32b	2.00
p-Value	<0.001	<0.001	<0.001	0.003	
CV	52.53	27.86	5.44	11.74	

Means with the same letter within each column are not significantly different at p<0.05,

Assessment of heavy metal availability under different fertilizer practices in coconut growing soils

Soils and Plant Nutrition Division

Organic fertilizer serves as an important source of nutrients while improving the chemical, physical and biological properties of soil. Hence, it is considered as environmentally friendly compared to inorganic fertilizers. However, continuous application of organic fertilizers could also result in contamination of soil with potentially toxic elements, microplastics, and antibiotic residues subsequently affecting beneficial microorganisms in soil and causing food chain contamination through plant uptake. Hence, this study was aimed to assess the impact of different fertilizer practices and the application period on accumulation and availability of heavy metals in coconut growing soils.

Soil samples (0-25 cm below the soil surface) were collected from 9 coconut estates having a history of more than 10 years of manure application (i.e. cattle manure, goat manure and poultry manure) in Kurunegala district and they were analyzed for total and available heavy metal contents. Available As, Cd, Pb, Ni and Cr contents of the collected soil samples ranged from 0.12 to 1.07, 0.01 to 0.07, 1.25 to 3.45, 0.25 to 1.16, and 0.04 to 0.11 mg/kg, respectively. None of the collected soil samples exceeded the maximum permissible levels of total heavy metal contents for agricultural soil imposed by the European Union.

Use of common Muriate of Potash for Fertigation of Coconut

Soils and Plant Nutrition Division

Water and nutrients are essential requirements for the yield performance of coconut. Fertigation is a method which can be used to provide fertilizers through the irrigation system. Practice of fertigation has showed significantly higher Nutrient Use Efficiency (NUE) compared to the conventional fertilizer application practice for many crops as it provides ability for split application of fertilizers.

Many coconut farmers in Sri Lanka use common Muriate of Potash (MOP) for fertigation with different soaking practices considering the difficulty in finding complete water-soluble potassium fertilizers and the high cost of fertilizers. As MOP is partly soluble in water, the required nutrient quantity is supplied excessively or partially. Therefore, a laboratory experiment was conducted to find out the best MOP: water mixing ratio, the suitable soaking time required to keep before stirring and the highest dissolution level of MOP. 1:2, 1:3, 1:4 and 1:5 weight to volume (g/ml) ratios and 1-, 2-, 3- and 12-hours soaking times were used for the study.

The main effect of mixing ratios was statistically significant ($P < 0.001$) and the highest dissolution rate was observed in 1:4 mixing ratio with a 98.04% (W/W) dissolution rate. Statistically significant ($P=0.017$) results were obtained for the main effect of soaking time and the highest dissolution rate was observed for the 1-hour soaking time (93.45%).

Fig 15. Fertigation with Muriate of Potash

CLIMATE CHANGE EFFECTS ON COCONUT PRODUCTION

A preliminary study on effects of antitranspirants on coconut seedlings under water stressed conditions after transplanting

Plant Physiology Division

Foliar application of antitranspirants is one of the promising tools for regulating transpiration to maintain a favorable plant water status especially in seedling stage. Applying antitranspirants to overcome adverse weather conditions is not popular in Sri Lanka. Therefore, this experiment was designed with the aim of investigating the potential of using antitranspirants on coconut seedlings to reduce transpiration and alleviate adverse effects of drought after transplanting. The study was conducted as a preliminary trial with four antitranspirants; kaolin, CaCO3, MgCO3 and Muriate of Potash (MOP). Nursery raised seven-month-old DT and TT seedlings were used.

Three concentrations (3% w/v, 5% w/v and 7% w/v) were tested. Rate of transpiration, leaf temperature, leaf sugar content, leaf starch content, chlorophyll content and growth parameters were measured at 5 days intervals. There was no significant difference among the treatments with respect to the growth parameters, leaf starch content, sugar content and chlorophyll content in both varieties. However, there was a significant difference among treatments with respect to leaf temperature and transpiration. But the concentration x treatment interactions was not significant. Therefore, another detailed trial was scheduled with selected two antitranspirants; Kaolin and CaCO3 and with the lowest 3% concentration under water stressed conditions.

Effect of climatic conditions on yield variation of coconut

Plant Physiology Division

The Annual National Coconut Production (ANCP) for the year 2022 was estimated based on the yield data collected from more than 900 coconut plantations distributed in all coconut growing districts of the country. The ANCP was 3351.8 Mn nuts in 2022 and it was the second consecutive year having above 3000 Mn. coconut production. Thus, the production in 2022 was only 1% lesser than the production in 2021 (3382.9 Mn nuts). When the pick-wise yield variation is considered, instead of having one peak period with the highest yield in general, three picks i.e. 2nd, 3rd and 4th picks showed above 600 Mn. production in 2022. The lowest yield of 420.1 Mn. was observed in pick 6 (November / December). The estimated ANCP of 2022 was about 4% higher than that of the predicted value and much closer to the forecast for the year (3219.0 ± 29.0 Mn Nuts).

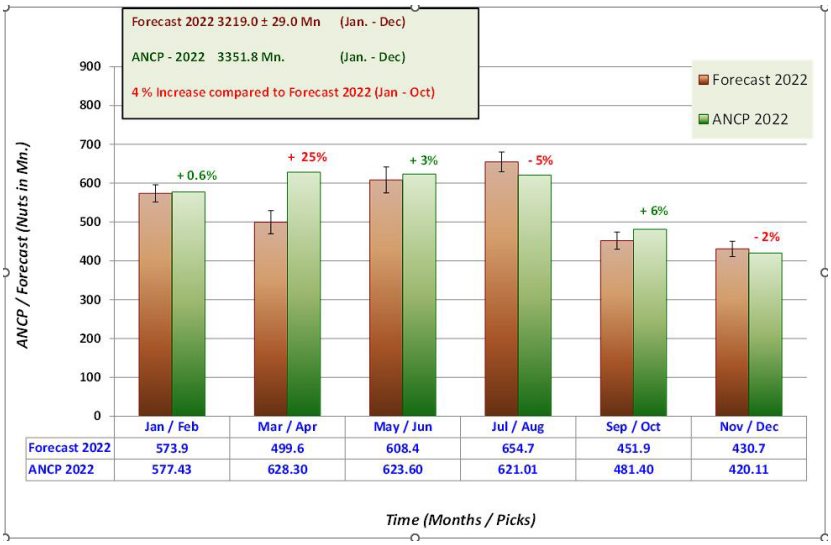


Fig 01. Comparison of the actual Annual National Coconut Production (ANCP) on bimonthly basis for 2022 with the forecast

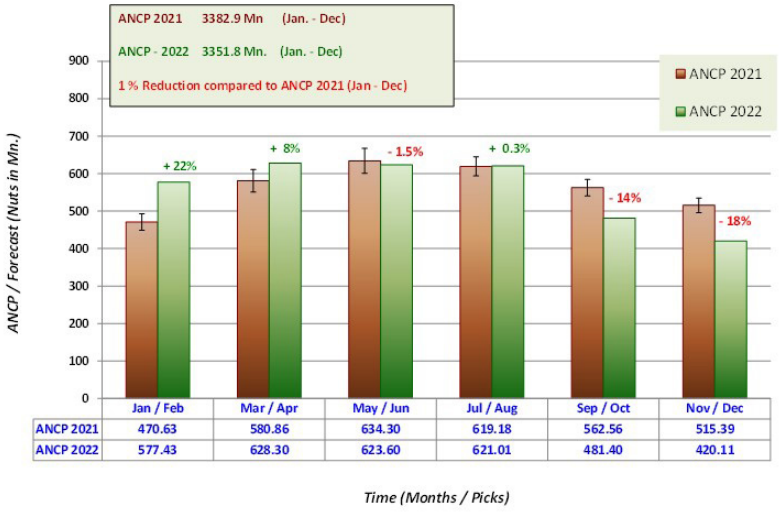


Fig 02. Comparison of the actual Annual National Coconut Production (ANCP) on bimonthly basis for 2022 with ANCP 2021

This higher production in 2022 was well contributed by the higher and substantially well-distributed rainfall received in most coconut growing districts in 2021 and early part of 2022. According to the records of rainfall, the average annual rainfall received across all meteorological stations covering all coconut growing districts in 2021 (2,373.3 mm) was about 54% higher than that of 2020 (1534.9 mm). All districts have received some degree of higher rainfall in 2021. Out of them, four districts i.e., Kegalle (109%), Kandy (105%), Mannar (102%) and Hambantota (101%), have received more than the doubled rainfall

compared to those of the previous year. Six districts i. e. Moneragala, Puttalam, Matale, Rathnapura, Ampara and Gampaha districts have received more than 60% higher rainfall in 2021 compared to those of 2020. Rest of the districts also have received higher rainfall but with varying degrees. With respect to the mean annual rainfall of across coconut growing districts during past ten-year period, 2021 was the year with the highest mean annual rainfall. Moreover, maximum air temperature (Tmax) in most coconut growing districts except a few dry zone districts, has remained below the critical value of 33oC. This conducive rainfall and temperature condition have contributed immensely for the relatively higher yields observed in 2022.

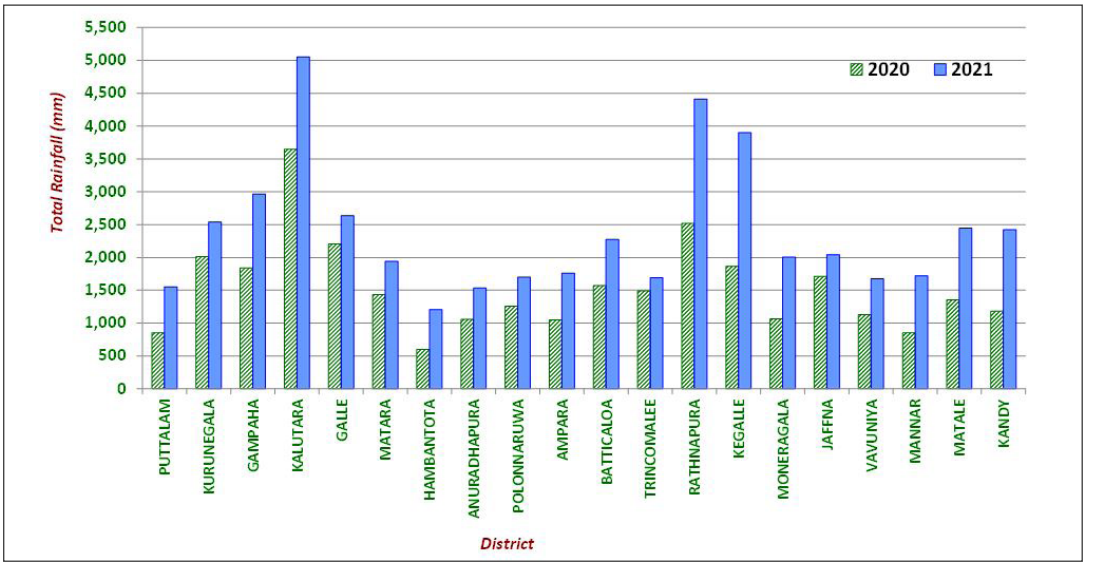


Fig 03. Comparison of total rainfall (mm) of 2020 and 2021 in coconut growing districts

CROP PROTECTION

Assessment of the current status of coconut whitefly infestation in Sri Lanka

Crop Protection Division

Whitefly is a new invasive pest of coconut in Sri Lanka. This highly polyphagous pest causes a havoc in many coconut growing areas of the country. As first incidence of whiteflies in coconut was reported in 2019, the current status of its distribution and the damage severity was assessed.

Extensive field surveys were carried out to study the distribution of whitefly in coconut in Sri Lanka. Initially, the whitefly infestation in coconut was observed in a localized manner in Kegalle district during the year 2019. By the end of 2022, the infestations were reported from Gampaha, Colombo, Kegalle, Kandy, Kalutara, Galle, Matara, Puttalam, Kurunegala, Matale, Hambantota and Badulla districts with varying degree of infestations.

Whitefly infestation was observed more severe on the lower whorls than on the middle and upper whorls of the coconut and king coconut palms. Irrespective of age, all the coconut and king coconut palms were susceptible to whitefly infestation. In Sri Lanka, king coconut and yellow dwarf coconut varieties were more susceptible to whitefly infestation.

Fig 01. Severe whitefly infestation in a king coconut palm

Morphological identification of whitefly species of coconut and its potential natural enemies in Sri Lanka

Crop Protection Division

Identification of a pest, up to its species level is important for developing management strategies. Though whiteflies have long been recorded in many agricultural crops in Sri Lanka, the whitefly of coconut is a new threat. Due to the invasive nature of the pest, it is important to identify their species to develop effective control measures.

Hence, random field surveys were conducted in selected geographical regions (Gampaha, Colombo, Kandy and Kegalle districts) from March to November, 2022 for morphological identification of whitefly species associated with coconut in Sri Lanka. This was performed using standard morphological keys.

Four non-native whitefly species namely, Rugose spiraling whitefly (*Aleurodicus rugioperculatus* Martin), Nesting whitefly (*Paraleyrodes minei* Quaintance), Palm-infesting whitefly (*Aleurotrachelus atratus* Hempel) and Spiraling whitefly (*Aleurodicus dispersus* Russell) were morphologically identified infesting coconut palms in Sri Lanka. This is the first report of scientific identification of whiteflies in coconut in Sri Lanka.

Further studies are ongoing to confirm the identity of above species using molecular tools.

Several species of *Encarsia* including *Encarsia guadelaupae* were identified as a parasitoid and *Cryptolemus* sp., as predators of whiteflies associated with coconut.

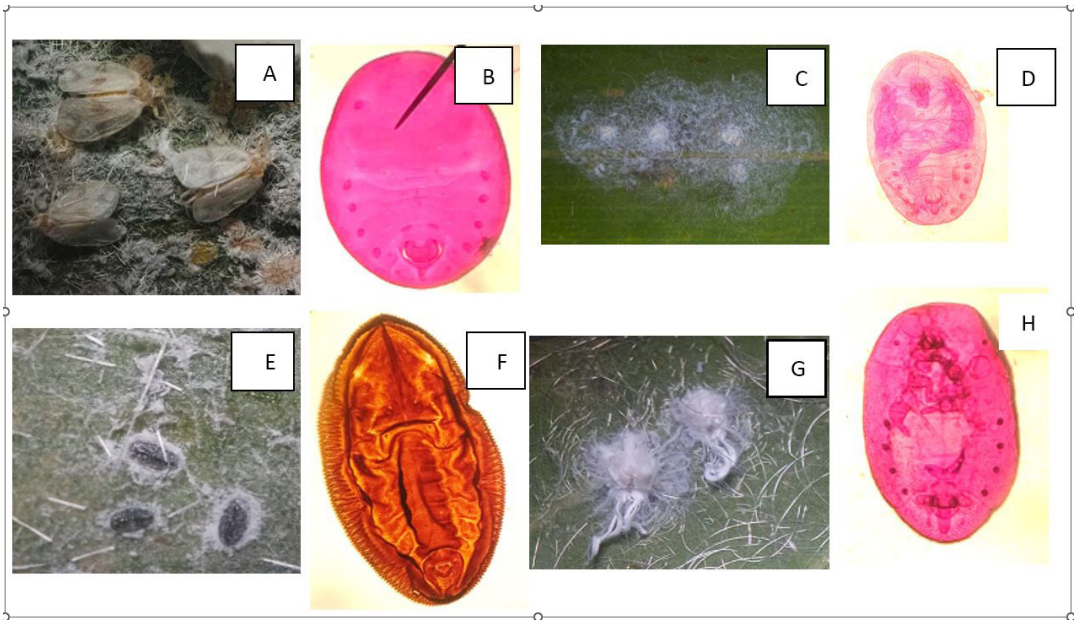


Fig 02. A. adult of *Aleurodicus rugioperculatus*; B. pupa of *Aleurodicus rugioperculatus*; C. adult of *Paraleyrodes minei*; D. pupa of *Paraleyrodes minei*; E, F. pupa of *Aleurotrachelus atratus*; G,H. pupa of *Aleurodicus dispersus*

Testing commercially available biopesticides for the control of Plesispa beetle (*Plesispa reichei*) under laboratory conditions

Crop Protection Division

Plesispa beetle is a serious pest of coconut seedlings. Currently, only synthetic insecticides are recommended and being used to control this pest. Therefore, this study was conducted to determine the efficacy of commercially available, selected biopesticides in controlling Plesispa beetle under laboratory conditions.

The commercially available three insecticides namely, BioSolex, Flipper and Agro Safe Liquid (ASL) were evaluated. Carbosulfan 20% was used as the positive control and distilled water was used as the vehicle control. Both the adult and larval stages were tested at the exposure of 24, 48, and 72 hours respectively and the mortality percentage was recorded. The biopesticide concentrations which showed 90% lethality interpolated from concertation inhibition curves was tested for phytotoxic effects.

The results showed that the tested three biopesticides showed concertation and time-dependent increase in mortality. At 48 hours, the LC50 values r espectively for adult and larvae were 0.14x104 ppm and 0.03x104 ppm on BioSolex, 19.4x104 ppm and 15.6x104 ppm on Flipper, and 39.6x104 ppm and 36.7x104 ppm on ASL. Flipper and ASL showed significant differences in mortality at very high concentrations.

In summary, BioSolex offered high mortality at low concentrations without any phytotoxic effect. Field experiments are needed to further evaluate the biopesticides.

Molecular detection of fastidious prokaryotes associated with Weligama Coconut Leaf Wilt Disease (WCLWD) and Leaf Scorch Decline (LSD)

Crop Protection Division

Experiments were conducted for the molecular detection of fastidious prokaryotes associated with Weligama Coconut Leaf Wilt Disease (WCLWD) and Leaf Scorch Decline (LSD). Six sampling rounds were completed and a total of six hundred and twelve (612) tissue samples were taken from WCLWD, LSD, apparently healthy and healthy coconut palms for Polymerase Chain Reactions (PCR) to identify the presence of xylem-phloem limited fastidious prokaryotic plant pathogens.

Positive results were obtained only for *Phytoplasma* from WCLWD palms and clear DNA bands were subjected to Sanger sequencing and results were compared with GenBank deposits and found that all the sequences were 99-100% matched with Sugarcane white leaf disease causing *Phytoplasma*. According to the sequencing results, four new phytoplasma isolates were identified and deposited in the GenBank. None of the other fastidious prokaryotes except phytoplasma gave positive results for coconut in PCR so far.

Fig 03. WCLWD affected palm

Table 01. New phytoplasma isolates associated with WCLWD

Sample ID	BLASTn best match pathogen	Percent similarity	Accession number
Weligama Isolate 8 (Positive control- Sugarcane phytoplasma)	Sugarcane white leaf phytoplasma	100	OP279594
Weligama Isolate 9	Sugarcane white leaf phytoplasma	99.77	OP279485
Weligama Isolate 10	Sugarcane white leaf phytoplasma	99.51	OP279647
Weligama Isolate 11	Sugarcane white leaf phytoplasma	99.88	OP279533

In addition, two *Liberibacter* positive *Citrus* leaf samples were identified from citrus trees with interveinal chlorosis symptoms from two coconut lands in the Southern province with WCLWD affected palms. Samples were sent for Sanger sequencing for further confirmation. Depending on the sequencing results, those samples could be used as a positive control in PCR detection of *Liberibacter* in future. Since planting Citrus as an intercrop with coconut is recommended, there is a possibility to have cross infections with coconut.

Application of Systemic Acquired Resistance (SAR) Inducers for the management of WCLWD and LSD

Crop Protection Division

An experiment was conducted to identify the effect of the application of Systemic Acquired Resistance (SAR) inducers for the management of WCLWD and LSD. Six rounds of SAR inducer application and symptoms recording were completed. Reduction of disease severity index in treated palms compared to control palms was observed in WCLWD affected palms. The experiment is in progress.

COCONUT PROCESSING AND PRODUCT DEVELOPMENT

Value added Coconut jaggery with low glycemic index

Coconut Processing Research Division

A clinical study was completed using 40 human subjects to find out glycemic index of coconut jaggery. Ethical Clearance was obtained from the ethical committee of National Hospital Colombo. The average age of healthy volunteers of the study was 28 years and all of them had healthy Body Mass Index (BMI). Average fasting blood glucose concentration and value of HbA1c of the study group were 98.23±9.10 mg/dl and 4.83±0.33%, respectively. The screening result provided a clear view of health status of the subjects of this study.

Glucose response and Glycemic Index (GI) of Jaggery prepared by the traditional sap collection method with Hal bark, new sap collection method (NSCM) developed at CPRD of CRI and value added jaggery prepared by incorporating 0.2% cinnamon (CIN Jaggery) and 0.05% nutmeg (NUT Jaggery) with pure sap collected using NSCM were determined. All types of jaggery produced felled within the group of medium glycemic index containing food. The GI values of jaggery was reduced by the introduction of halbark, nutmeg and cinnamon into pure sap.

Table 01. Glycemic index of value-added coconut jaggery types

Jaggery Type	Glycemic Index	Glycemic Group
Cane Sugar	60.76	Medium GI
NSCM jaggery	65.19	Medium GI
HAL Jaggery	55.79	Medium GI
NUT Jaggery	57.56	Medium GI
CIN Jaggery	59.45	Medium GI

It revealed that the GI value can be reduced by introducing Nutmeg, Cinnamon and halbark during the preparation of jaggery while keeping edible quality.

Production of fresh coconut paste and its use

Coconut Processing Research Division

Scraped coconut and water were mixed in a ratio of 1:7 (w/v) with the objective of preparing a viscous fresh coconut paste. Then scraped coconut and water were put into the hopper of the colloid mill from time to time to prevent clogging in a narrow part of the hopper. Then they were passed through the rotor and stator of the colloid mill which caused a high shearing force in the narrow gap between the rotor and stator ensuring breaking down of scraped coconut into very small size particles. Thereafter, the mixture of tiny coconut particles and water was passed to the discharge area. Milling process was continued until a homogeneous fine paste is obtained.

A study was carried out to explore the suitability and consumer acceptability of fresh coconut paste (FCP) as a substitute for the coconut milk compared with conventional coconut milk (CCM). Thus, it was aimed to reduce the consumption of coconuts in the Sri Lankan households and thereby to increase the availability of nuts for the coconut-based industries.

The proximate composition of FCP is: moisture 67.46 ± 0.72%, fat 27.89 ± 0.40%, crude fiber 1.29 ± 0.04%, protein 1.27 ± 0.01%, ash 0.73 ± 0.08%, and carbohydrate 2.63 ± 0.44%. Sensory evaluation (carried out with dhal curries prepared with FCP and CCM) using five-point hedonic scale indicated that the taste and odor of CCM and FCP curries were not significantly different ($p>0.05$). In addition, a consumer survey was conducted with 150 consumers from the Gampaha and Colombo districts, instructing them to prepare dhal curry using FCP packets. According to the consumer survey, 61% preferred to buy FCP if it is in the market. The most preferred quality of the product was the easiness of usage. FCP can be stored for up to 2 weeks under refrigerated conditions which can be increased further with good hygienic practices. The actual amount of coconut contained in a 50g of FCP is 16.27g, and when using 150g of FCP per day per household, 274 nuts and Rs. 28,680/= can be saved per year compared to hand-squeezed coconut milk.

Fig 01. Preparation of fresh coconut paste using colloidal mill

Isolation of microbes for accelerating fermentation of coconut milk for extra virgin coconut oil (EVCO) production

Coconut Processing Research Division

Research findings revealed that Lactobacillus isolated from fermenting coconut milk had the highest oil recovery in producing extra virgin coconut oil using wet process (CRI Annual report, 2021). Lactobacillus (D) with 319.67 × 106 microorganisms/ml was used in different concentration (10%, 5% and 2.5%) for the fermentation of coconut milk to produce coconut oil. Microbial count of the initial culture was 319.67 × 106 microorganisms per milliliter. Results indicated that coconut milk with 10% concentration of D completely fermented and produced highest volume of EVCO (16.5%) within 18 hours.

Quality of EVCO Results showed that the oil quality were within the standard of Sri Lankan Standard Institute. Although oil in milk was separated after introducing microorganisms, there was no detectable Total Plate Count (TPC) and Yeast and Mold count at the time of production. It was a good indicator for longer shelf life in EVCO. The research is in progress to identify the interaction effect of selected microorganism, pH and cellulase enzyme to accelerate the extra virgin coconut oil production.

Technology development for the production of coconut Butter

Coconut Processing Research Division

Experiments were continued on the development of coconut butter spread, incorporated with 25% sugar, 10% corn starch and 1.5% palm stearin, which was identified as the best product with comparatively lower layer separation and high sensory scores among different formulae.

Fig 02. Coconut butter spread

Nutritional composition of the coconut butter spread was 1.57±0.04% moisture, 43.35±2.02% fat, 1.17±0.18% ash, 7.84±0.54% fiber, 12.49±0.21% protein and 33.59 ±1.64% carbohydrates. The Total Plate Count (TPC) and Total Yeast and Mold Count (TYMC) of the product were at the favorable level. Color of the product indicated that its L* (lightness or darkness) value

was 93.80± 0.37, a* (redness or greenness) value was 0.65± 0.03 and b* (yellowness or blueness) value was 9.71± 0.30. Those values were higher than the values for dairy butter. The results of the texture analysis indicated that the hardness for the cutting force of coconut butter spread was 573g. The coconut butter spread showed moderate hardness compared to dairy butter and margarine.

Quality and shelf-life improvement of coconut paring oil using steaming and drying treatments

Coconut Processing Research Division

A study was conducted to investigate the effect of steaming and drying treatments on the storage stability of coconut paring (testa) and quality of testa oil. Storage stability of dried paring indicated that the steam processed paring had a high peroxide value which increased during the observation period of 3 weeks. Oven dried paring had low peroxide value compared to sun drying and had longer storability compared sundried paring. Steamed paring showed high peroxide value compared to the respective non steamed parings and therefore steaming is not effective to increase storage of dried coconut paring. Microbiological data indicated that steaming can reduce initial microbial load of paring. Higher yield of paring oil is reported from steamed parings.

Oil extracted from dried parings indicated that the steam processed oven dried paring produced paring oil with lower free fatty acid content compared to parings processed while peroxide value recorded higher value. As peroxide value of oil contributes to objectionable odour and quality, steam treatment is not suitable for dehydration of paring for oil extraction process. The physiochemical and functional properties of paring oil extracted from parings under study are presented in the Table. Experiment is continued to validate the results.

Table 02. The physiochemical and functional properties of paring oil with storage time

Quality	Steam				Non-steam			
	Ovendried		Sundried		Oven dried		Sundried	
	Initial	30 days	Initial	30 days	Initial	30 days	Initial	30 days
FFA %	0.14± 0.04	0.34± 0.08	0.25± 0.05	0.34± 0.04	0.29± 0.04	0.36±0.06	0.43 ± 0.09	0.50±0. 06
Peroxide Value meq/kg	0.92± 0.18	1.64± 0.25	2.57± 0.59	2.80± 0.69	0.79 ± 0.43	1.39± 0.56	1.05 ± 0.41	1.78±0. 70
Color Y+5R	2.03 ± 0.77	2.2± 0.49	2.33± 0.49	2.7±0.32	2.53 ± 0.26	2.43± 0.41	2.13± 0.75	2.56±0. 33
Moisture %	0.12± 0.01	0.28± 0.02	0.14 ± 0.03	0.16± 0.03	0.16±0.01	0.23±0.03	0.24± 0.02	0.24±0. 03

Biodegradable Packaging material from coconut protein isolates

Coconut Processing Research Division

Preparation of biodegradable packaging material (BDPM) films using coconut protein concentrate (CPC) obtained from defatted dehydrated coconut residue of virgin coconut oil production was continued. Study on utilization of the CPC based BDPM incorporated with 0.05% and 0.1% powdered cinnamon bark (PCB) and one without powdered cinnamon bark for Food wrapping was carried out.

Sandwich bread wrapper

Coconut paste concentrate (CPC) based PCB incorporated BDPM for use as a sandwich cling wrap and sandwich without wrapping were used in order to study the effect of the CPC based PCB incorporated BDPM for sensory quality and food safety aspects.

Results of sensory analysis revealed that, taste, texture and overall acceptability of the samples change significantly ($p<0.05$) with the type of packaging materials and the CPC based PCB incorporated BDPM can be successfully used for wrapping sandwich bread. However, BDPM had lower moisture retention and the bread sample lost freshness during 6 hours period and therefore, further studies are in progress to improve the usage of CPC based BDPM.

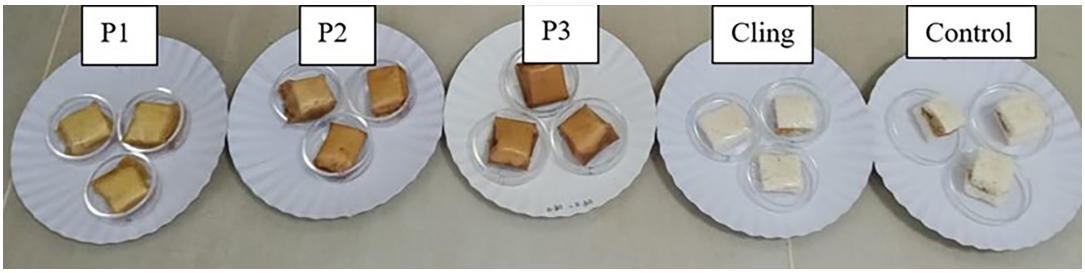


Fig 03. Wrapping of sandwich with packaging materials in the sensory study

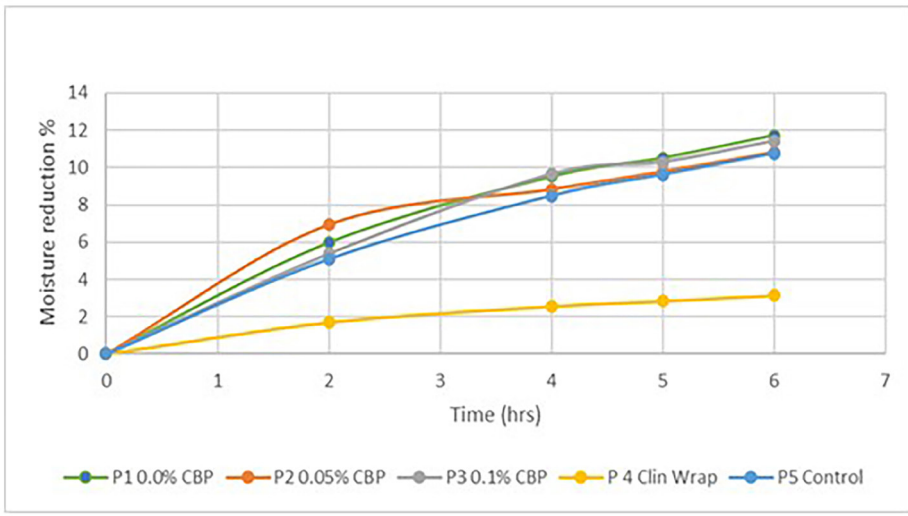


Fig 04. Moisture reduction of sandwich bread with CPC based BDPM

Phenolic and flavonoid constituents of Coconut Testa Flour : Staple foods supplemented with defatted coconut testa flour

Coconut Processing Research Division and Institute of Fundamental Studies

1. String hoppers

Previous studies have reported that the coconut testa flour (CTF) of all local coconut cultivars could be rich sources of phenolics and flavonoids, which have the ability to act as potential antioxidative and anti- hyperglycemic agents. Thus, it has a great potential as a functional ingredient in food processing industry. Therefore, to use those properties in our food system, a study was carried out to investigate the acceptability of string hoppers incorporated with defatted coconut testa flour (CTF). The results showed that string hoppers (idiyappa) which is of acceptable quality could be prepared using composite flour mixtures of 25% of CTF and rice flour. This was based on the highest overall acceptability and other sensory attributes observed from a sensory evaluation. The proximate analysis of the string hopper showed improvements in nutritional properties with regard to protein, dietary fiber, fat, and mineral contents. As all samples reported a higher percentage of insoluble dietary fiber than soluble dietary fiber, the product would exert tremendous prebiotic health benefits.

2. De-fatted testa flour added roti and pittu

The underutilized by-product of coconut testa in the coconut processing factory was successfully utilized for the roti and pittu preparation with 20% incorporation of de-fatted testa flour (TF). Selected recipe for roti preparation is 60g of coconut meat, 30ml of water, 3.5g of salt and for Pittu with 60g of coconut meat, 15ml of water and 2g of salt.

Evaluation of Glycemic index of two types of roti samples is in progress.

Nutritional characteristics of coconut flour incorporated foods

Funded by SLCARP and conducted by the Coconut Processing Research Division

Coconut flour incorporated bread

The effect of particle size distribution of coconut flour on baking quality of sandwich bread was studied. Coconut flour was separated to 3 particle sizes of greater than 500µm, 500-150 µm and less than 150 µm. Proximate composition of the coconut flour with different particle sizes indicated that moisture content, ash content and crude fibre content were significantly different while fat and protein contents were not significantly different ($p>0.05$). Significantly low swelling capacity was observed from the particle size 500-150µm while a similar swelling capacity was observed from particle sizes with higher than 500µm and smaller than 150µm which were also similar to the swelling capacity of wheat flour. Bulk density, wettability, water absorption, hygrospicity were also significantly different among the particle sizes of coconut flour. Study concluded that the addition of coconut flour of above particle sizes into wheat flour did not differ in baking properties of sandwich bread.

Improvement of Glucose tolerance in non-diabetic rats compared to diabetes induced rats by feeding VCO or Soya oil

Collaborative study: Faculty of Medicine, University of Peradeniya and Coconut Processing Research Division of CRI

Diabetes mellitus is a chronic disease caused by either absolute insulin deficiency or impaired insulin action and characterized by hyperglycaemia that causes many derangements in the normal physiology. This study aimed to elucidate the effect of VCO or soya oil (SO) on glucose tolerance in diabetic (D) and non-diabetic (ND) rats, in the presence of insulin, when compared to the non-insulin receiving animals studied earlier. Three groups of randomly selected Sprague Dawley rats (n=8 each; 6-8 weeks old; 150-200 g) were randomly allocated to diabetic group (D) and were induced diabetic status with alloxane while three groups were allocated to ND group. All animals received insulin (1U/day) subcutaneously, on a daily basis. Three groups in each category were fed with water, VCO or SO with 7.5ml/kg body weight/day for 90 days. The results showed that VCO and SO were capable of improving the glucose tolerance when insulin was available, but not in absence. Previous report indicated that diabetic rats with insulin at both 45 and 90 days showed a strong increase in the glucose tolerance when compared to SO. Red cell fragility of the blood obtained from the VCO, SO and water fed groups showed that the red cell fragility was lowest in the non-diabetic animals fed with VCO, indicating that the VCO helped in the stabilization of the cell membrane.

MCF7 Human breast cancer cell line was established in the laboratory using minimum essential medium (αMEM) supplemented with 10% fetal bovine serum (FBS) and 1% penicillin streptomycin, in 5% CO2 environment. Fatty acids produced by the digestion of VCO and SO, or water were added to cultures at 0.5µl per well and incubated for 4 days. The spent medium was analyzed for remaining glucose to study the effect of fatty acids of VCO and SO on the glucose uptake by cells. Study is in progress.

Development technology for production of comfortable rubber Gloves and Rubber safety Boots by Applying Coconut Husk Products

Coconut Processing Research Division

Synthesis of nano-metallic and nano-cellulose

Rubber boots and gloves are used for body protection. However, in warm, tropical climates, wearing of these items may be uncomfortable, due to sweating. Similarly, repellant of microorganisms is also a requirement for the protection the body.

The objective of this study was to add value to rubber formulae using composite of coir fibre and rubber to use in manufacture of rubber boots and rubber gloves for comfortable use for body protection. Coir fiber in different lengths of 0-0.5mm and 0.5 to 1mm was used to make the coir rubber composite and the suitability of the length size was analyzed. Results showed that higher tensile strength (13 ± 1 MPa) could be obtained from 0-0.5mm coir fiber when 40% (w/w) of the carbon black was replaced with coir fibre.

To achieve the antibacterial property, silver (Ag) nano particles were produced using

green synthesis method and were tested its antimicrobial property. Media containing Ag nano particles inhibited Psudomanas and Escherichia coli and therefore, the property will be used for producing rubber composite for making rubber boots and gloves. Research is being continued to assess the antimicrobial effect of ZnO nano particles produced by green synthesis.

Further, research is in progress to synthesize macro, micro and nano celluloses from coir fibre for the production of rubber composites needed for this study.

SOCIO- ECONOMICS

Overall Sector Performances of Kernel, Fiber and Other products

Agricultural Economics & Agribusiness Management Division

At present coconut serves as one of the main contributors to the Sri Lankan economy. In 2022, the annual national coconut production was 3,352 Mn nuts which was only a 1% reduction compared to the highest coconut production of 3382.9 Mn nuts observed in 2021. Accordingly, the foreign exchange earnings were Rs. Billion 263 (USD 817 Mn) in 2022 and it was just a 2% decline compared the earnings of USD 834 Mn in 2021.

The coconut oil production which was 43,038 MT in 2021 has increased to the level of 68,587 MT which was a significant growth of 59% compared to that of 2021. Exports of Coconut milk have declined slightly by 1% from the previous year's export quantity of 53,255 MT. Virgin coconut oil industry has not shown any significant growth in the export volume, while the Desiccated coconut (DC) production also has shown only a 5% growth in the production compared to that of the previous year. When the kernel products are considered, DC and Coconut milk have prominently contributed towards the export revenue of USD 96.11 Mn and USD 92.31 Mn respectively.

The export revenue from shell products has increased from USD 148 Mn in 2021 to USD 163 Mn in 2022 showing about 10% increase. Export earnings from fibre finished products has reduced by 1% in 2022, compared to that of 2021. Under the category of finished products of fibre, the highest contribution to the export revenue was from moulded coir products.

The importation of edible oil during the first half of the year was higher when compared to that of the second half of the year. Of the total imports, 67% has been imported during the first six months.

In general, with all the prevailed unhealthy environment, coconut sector performance was significant in nut production, supply of edible oils to the local consumers as well as foreign exchange earnings.

Assess the impacts of release of predator mite to control Aceria mite (2019 – 2021)

Agricultural Economics & Agribusiness Management Division

This study was conducted to assess the effectiveness of the release of predator mite to control Aceria mite at farmer field conditions. The experiment was started with the collaboration of Kurunegala Plantations Ltd. That was already involved in breeding predator mite in their own laboratories. Mite application continued for two years as recommended by the Coconut Research Institute and the coconut production data in 2019 and 2020 were compared. Average number of mite damaged nuts was 4.76 and 3.62 nuts per palm per month in 2019 and 2020 respectively and the reduction was significant ($P< 0.05$). Moreover, when the full priced nuts are considered, number of mite damaged nuts has declined from 3.5 to 2.5 nuts per palm per month. The experiment continued in 2021 to evaluate the residual effects of the releasing predator mite. The last release of predator mite was in October 2020. Recording of coconut production was continued for the year 2021 and the analysis of data showed that the effect of predator mite was continued only for another three-month period after two years of continuous releasing. The results showed a significant increase of mite damage after six months of predator release. Therefore, the study concluded that although the release of predator mite to control Aceria mite in the farmer field was successful, the continuous application and the frequent inspection for incidences are required to manage the damage effectively.

Productivity improvement under climate uncertainty in home gardens in most vulnerable areas (2019 – 2022)

Agricultural Economics & Agribusiness Management Division

This study comprised of three sections. In the third section of the study, effects of non-tariff measures (NTMs) on the export of coconut products was explored. Major export destinations of coconut kernel-based products of Sri Lanka are mainly developed countries. However, access to these markets of developed countries is challenging, as exporters have to comply with a considerable number of NTMs which possibly lead to border rejection of shipments, unless they are complied with. More than 25% of the kernel-based products of Sri Lanka are exported to European Union (EU) where the Rapid Alert System for Food and Feed (RASFF) share the information on food safety and border rejection in EU member countries. Hence, the objective of this study was to investigate the occurrence and prevalence of the border measures and the pattern of border rejections of coconut kernel-based products originated from Sri Lanka from 2009 to 2021 using the RASFF notifications as the source of data.

The results of the analysis showed that notifications have been received from seven EU countries (Italy, United Kingdom, The Netherlands, Greece, Ireland, Poland and Denmark) and among them 35% of the notifications were from Italy followed by United Kingdom (23%). Three types of border notifications have been received namely: a) border rejection, b) information and c) alerts and from that 41% of them were border rejections. Pathogenic microorganisms and microbial contaminants have been the reasons for border rejection.

Salmonella was the most important pathogenic microorganism reported in coconut kernel-based exports from Sri Lanka and it was the reason for 23% of the border notifications. The highest (24%) was observed in 2012 and 2016 while there was no any rejection from 2019 to 2021. A decline in the aggregate number of rejections was observed. As EU is one of the top export destinations of Sri Lankan coconut kernel-based products, Sri Lankan exporters must follow measures throughout their production and export process to be compliant with NTMs imposed by the EU.

Dynamics of Household Coconut and Edible Oil Consumption of Sri Lankan Consumers

Agricultural Economics & Agribusiness Management Division

One of the objectives of this study was to ascertain the present pattern of consumption of edible oils and coconut by households in the rural, urban, and estate sectors of Sri Lanka. The study was conducted within the coconut triangle, encompassing the three sectors.

According to the results, the often-used type of edible oil was coconut oil among the households and a fewer percentage used coconut oil alternatively with other types of edible oil such as palm oil, sunflower oil and olive oil. Only around 1% were noticed to have shifted from coconut oil owing to reasons such as availability, quality, and health concerns. Availability acts as a strong influential factor in determining the choice of edible oil followed by the price among the households. Majorly urban sector households incorporate coconut oil for 3 meals per day while the rural sector used it for 2 to 3 meals and for 2 meals by the estate sector. The mean per capita consumption of coconut oil and coconuts per month was around 230ml and 11 nuts respectively and according to the inferential statistics, the per capita consumption of coconut oil between each sector showed no significant difference. However, there was a significant difference in per capita nut consumption among the three sectors. Moreover, a tendency of increasing the purchase of coconut oil (at a 5% significant level) was observed with the increase in income of the household.

Consumers' willingness to pay for food safety labelling: The coconut oil market in Sri Lanka

Agricultural Economics & Agribusiness Management Division

Coconut oil is a major source of fat among Sri Lankans. With the liberalization of the edible oil market, the importation of edible oils has become a common practice during periods of low coconut yields. Coconut oil is often adulterated with these oils, affecting the food safety of the country. A safety labelling is a clear value addition to coconut oil to overcome this adulteration. It is important to discover the consumer willingness to pay (WTP) for safety labelling as such WTP measures will capture the trade-offs between cost-of-living pressures from price volatility of this essential commodity and consumers' perception on health concerns related to adulteration. The objectives of the study were to conduct a WTP analysis that is capable of capturing the price and quality trade-offs faced

by the consumer and to determine the preferences of consumers and their willingness to pay for different levels of safety labelling. Willingness to pay was measured using a discrete choice experiment approach, which facilitated evaluating existing and non-existing product attributes by simulating the natural purchasing behaviour of a consumer.

According to the estimates, the majority (72%) of the households used factory-processed, unrefined coconut oil for consumption, of which 84% purchased it without packaging due to its relatively lower price compared to bottled or canned products and the fact that 18% of respondents assumed it to be safe. The rural sector has a strong tendency to purchase coconut oil without packaging than the urban sector. Despite the fact that price is an influential factor in the decision to purchase coconut oil, 72% of respondents expressed their willingness to pay a premium price for a food safety-certified coconut oil due to recent adulteration issues. The majority of households were willing to pay for a bottled and labelled coconut oil certified by both the Sri Lanka Standards Institute and the Coconut Development Authority to ensure the quality and safety of coconut oil at an average price premium of 98 rupees per litre, as estimated.

On-going Research

Constraints for the choice of export market by local manufacturers of Virgin Coconut Oil

Agricultural Economics & Agribusiness Management Division

Virgin coconut oil (VCO) has gained popularity as a functional food due to its alleged health advantages. The knowledge of the general public on functional food oils has grown, and it is projected that VCO will experience a rapid growth in the near future. The demand for this oil continues to climb, owing not only to its excellent flavour, but also to its possible health benefits. However, the present situation of the industry in the global market clearly demonstrates that Sri Lanka is moving away from its competitiveness. Sri Lanka's total export market share of virgin coconut oil is continuously declining relative to its main competitors. Therefore, this study intends to identify the constraints and challenges face by VCO manufacturers in different scenarios and pave the way to strengthen the VCO export industry.

Factors affecting the value addition by coir exporters in Sri Lanka

Agricultural Economics & Agribusiness Management Division

Sri Lanka is one of the prominent countries for the coir production. The coir is one of the by-products of the coconut and the coir industry is considered to be one of the traditional industries in Sri Lanka. Sri Lanka produces four main categories of fibre namely, bristle, omat, mixed, and mattress which are either sold as raw materials in the international market or processed into value added products such as brooms, brushes, twine, matting, woven,

stitched geo-textiles, rubberized coir mattresses, etc. Since the introduction of industrial coir manufacturing in the country in 1900's, Sri Lankan coir manufacturers have been the main suppliers of raw coir fibre and coir fibre-based products to the global coir market. However, the proportion of value-added products in the global market still remains at a low level and currently Sri Lankan coir exporters tend to bring home comparatively less revenue against their competitors in India due to the lack of value addition in their export items. This study attempts to determine the factors affecting the coir exporters' decision on value addition to coir and also to identify the problems and potentials in the coir export industry by conducting a survey with coir manufacturers who are involving in value addition and those who are not.

Value chain analysis of coconut sap-based industries to propose policies for the industry development

Agricultural Economics & Agribusiness Management Division

Coconut sap is an exudate obtained by tapping the unopened inflorescence of the coconut palm and is used to produce coconut toddy which is an effervescence beverage. Coconut sap is also used to produce vinegar, treacle, jaggery and crystalline sugar. Among these, toddy production is most economical and is an alternative source of income for the coconut growers rather than solely depending on fresh nut production from the inflorescence. Despite the potential for expansion of the existing sap-based industry, yet the industry is in an infant stage. In order to strengthen the industry, a comprehensive analysis of the existing value chain is much needed while exploring the potential for further developments.

Hence, this study attempts to construct a farm budget for toddy tapping while identifying value chain actors and their functions, constraints attached with legal, social and management framework which limit development of the industry. Moreover, it is expected to explore the possibilities and opportunities for the development of the sap-based industries. An in-person survey based on a structured questionnaire was carried out focusing areas where toddy tapping is prominent namely Madampe, Katana, Beruwela, Panadura and Kalutara. Data analysis of the study is in progress.

DEVELOPMENTAL RESEARCH

Bioenergy Production

Agronomy Division

Bio-energy generation model was maintained in one hectare of coconut land comprised of 150 coconut palms and 2500 trees of gliricidia with externally supplied paddy straw to fed for six buffaloes at Ratmalagara Estate. In this system, gliricidia wood was used for gasification, buffalo dung was used to generate biogas, and biogas effluent was applied to coconut palms. This model is currently used to disseminate knowledge among numerous stakeholders frequently.

Fig 01. Gliricidia cultivation and bio-energy production unit at Ratmalagara Estate

Livestock integration

Agronomy Division

The demonstration of goat and sheep farming systems under coconut with the objective of increasing profitability of smallholder farmers through livestock integration was continued in Ratmalagara Estate. Both farming systems effectively control problematic weeds and improve soil fertility levels in coconut lands. More than 50 animals were reared with free grazing and CO-3 grass paddock systems. This model is also being used to technology transfer activities to numerous stakeholders.

Fig 02. Goat and sheep farming demonstrations at Ratmalagara Research Center

Pasture and fodder demonstrations

Agronomy Division

Two field pastures and fodder demonstrations containing fodder, pasture and cover crops were established in Ratmalagara and Bandirippuwa estates to upgrade the knowledge and awareness of the local community, coconut growers, university, agriculture and school students on livestock management in coconut lands.

Fig 03. Pasture and fodder grass demonstrations at Ratmalagara and Bandirippuwa Research Centers

Vermicompost production

Agronomy Division

The Vermicompost production unit in Ratmalagara Estate was maintained with commonly available waste biomass, crop and animal residues to produce nutrient-rich compost fertilizer within a short time. Processes were continued to multiply worms and to produce vermicompost for research and demonstration purposes. Worms were distributed among some coconut growers and this unit was also used as a demonstration model for farmers, universities, agriculture schools and students.

Fig 04. Vermicomposting demonstration at Ratmalagara Research Center

Intercropping demonstrations

Agronomy Division

More than twenty (20) intercropping models, including export agricultural, fruit, timber, fodder and tuber crops were maintained at Makandura and Rathmalagara Research Centers with the objective of knowledge dissemination and awareness of the local community, coconut growers, university, agriculture and school students on intercropping practice in coconut lands.

Fig 05. Intercropping demonstrations at Makandura and Rathmalagara Estates

Increasing the national seed nut production of hybrid and improved coconut varieties

Establishment of a new seed garden to increase the production of CRIC60 in collaboration with Sri Lanka Army (Kandakadu Seed Garden)

Genetics and Plant Breeding Division

CRIC60 is the main improved coconut cultivar in Sri Lanka for large scale commercial production. Currently, around 1.5 million CRIC60 seednuts are produced annually at the Isolated Seed Garden, Ambakelle and Maduruoya Seed Garden of the Coconut Research Institute of Sri Lanka. This production is insufficient to meet national seednut requirement which is about 4 million seednuts and the deficit is met using Plus Palms selected from different estates where the quality control is difficult.

Therefore, Coconut Research Institute initiated a collaborative project with the Sri Lanka Army to establish a seed garden for the production of CRIC60 at Kandakadu Army Camp, Welikanda. Total selected area for the seed garden is 100 ac. Seedlings were produced to plant 25 ac of the seed garden and the land preparation work was completed in 2022.

Fig 06. Planting mother palms at Kandakadu camp, Sri Lanka Army

Establishment of a new coconut seed garden for coconut hybrid production in the Wet- Intermediate Zone (Carlsfield Seed Garden)

Genetics and Plant Breeding Division

This collaborative development project with Kurunegala Plantations Ltd. was initiated in 2021 to produce Kapsuwaya seednuts with the funds received through the Ministry of Plantations.

During 2022, Tall coconut seedlings were planted in 20 acres. Establishment of a fence around the seed garden and the completion of the irrigation system were delayed due to the fuel crisis prevailed in the country. However, a rapid progress in both activities was observed during the fourth quarter of the year.

Fig 07. Planting of seedlings in the Carlsfield Seed Garden

Upgrading the Kiniyama Seed Garden

Genetics and Plant Breeding Division

Kiniyama Seed Garden was established by the Genetics and Plant Breeding Division, in 2013 as a Public-Public Partnership with Chilaw Plantations Ltd. to produce high yielding Kapruwana hybrid seed nuts.

In 2022, the hand pollination programme to produce Kapruwana seednuts was recommenced with 100 Green Dwarf Mother palms. Around 1000 green dwarf and Sanramon seedlings were planted to fill the vacancies and measures were taken to manage pest and diseases. The irrigation system was modified to irrigate part of the seed garden according to the capacity of the water source.

Fig 08. Kiniyama Seed Garden

Public-Private partnership for producing Hybrid seednuts

Genetics and Plant Breeding Division

A public-private partnership project was initiated in 2022 for the first time to produce commercial coconut hybrids in collaboration with CIC Agri Businesses (Pvt) Limited.

Three hundred Tall mother palms available at Palwehera CIC farm were selected as mother palms and a hand pollination programme was carried out by CIC Agri Businesses (Pvt) Limited to produce CRIC65 seednuts. Coconut Research Institute of Sri Lanka provided pollen and technical guidance for this hand pollination programme.

Increasing the hybrid seednut production by increasing mother palms in estates of the Coconut Research Institute

Genetics and Plant Breeding Division and Estate Management Division

A special development project was commenced in 2022 to increase the number of mother palms used for the hybrid seednut production in estates of the Coconut Research Institute of Sri Lanka. The target of this project was to increase the national hybrid seednut production up to 400,000.

With the addition of new mother palms in 2022, the total mother palms used for hybrid seednut production have reached 6150 palms. Hand pollination has been started in more than 5000 palms and the first set of hybrid seednuts from the newly added mother palms are expected from January 2023.

Scaling up the production of tissue culture coconut palms

Tissue Culture Division

A pilot scale project was initiated to scale up the production of tissue culture plants. Capacity building of Tissue Culture Division was initiated anticipating about five-fold increase of tissue culture plant production. The Tissue Culture Laboratory was moved and established in a newly built laboratory building. About 62 new inflorescence cultures were initiated during the first five months and were maintained. Due to budget restrictions, most of the equipment purchases were cancelled and due to import restrictions, chemical purchases were interrupted during the year. Therefore, the initiation of new cultures was restricted towards the latter part of the year.

Fig 09. Scaling up of tissue cultured coconut plants

Forecast of coconut yield of 2023

Plant Physiology Division

The expected change in the yield in 2023 compared to that of 2022 was predicted based on the fruit set data and the rate of survival of set fruits observed in main coconut growing districts. Accordingly, When the district-wise yield is considered, Kurunegala, Gampaha and Puttalam districts will show about 6%, 15% and 19% yield reductions respectively in first eight months of 2023 compared to that of 2022. Accordingly, the bi-monthly coconut yield predictions for 2023 (up to August) are 466.4 ± 28.7 for January/February (Pick 1), 633.4 ± 37.3 for March/April (Pick 2), 529.8 ± 38.5 for May/June (Pick 3) and 479.6 ± 26.9 for July/August (Pick 4) which amounts to a total of 2109.1 ± 35.5 Mn nuts for the period from January – August 2023. Except the pick 2 which showed slightly higher yield than that of the previous year, all other picks would be substantially lesser than those in 2022. Hence, the total production expected up to August (2109.1 ± 35.5) would be about 14% reduction compared to the same in 2022.

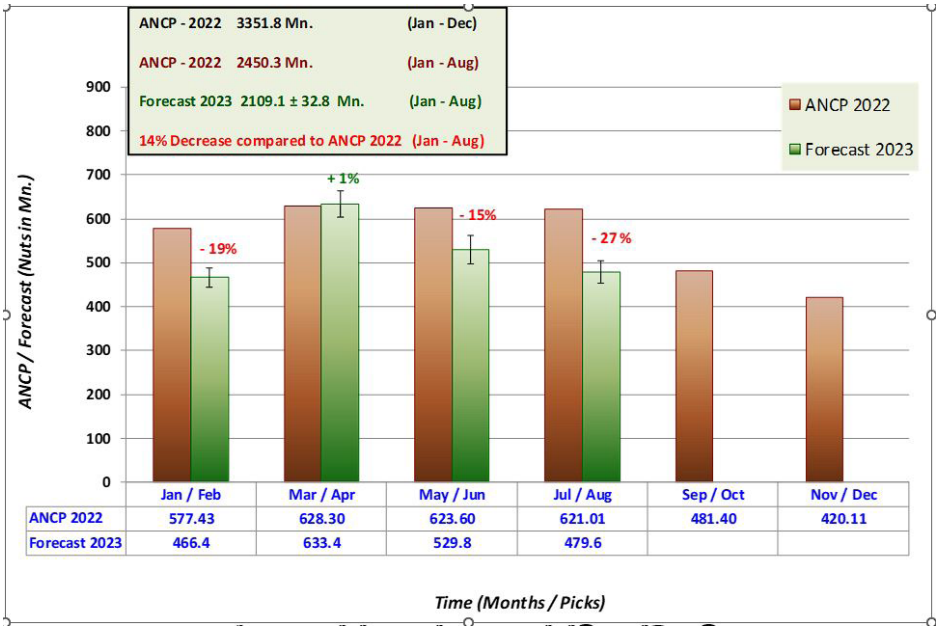


Fig 10. The yield prediction for 2023 (Up to August) with bimonthly breakdowns compared to the bimonthly Annual National Coconut Production (ANCP) observed in 2022

TECHNOLOGY TRANSFER

Media campaign for Good Agricultural Practices and reducing domestic wastage of coconut

Technology Transfer Division

A media campaign using social and mass media was conducted to make the general public aware on the Good Agricultural Practices (GAPs) and on reducing the domestic wastage of coconut. A fully-fledged media unit was established at the Coconut Research Institute and the Facebook page and the Website of the Institute was upgraded to international level. Several videos were prepared by the Media Unit of the Coconut Research Institute.

Fig 01. New website of the Coconut Research Institute

Technology Transfer activities conducted by the Technology Transfer Division

Certificate Course on Coconut Cultivation and Value Addition

Technology Transfer Division, Plant Physiology Division, Crop Protection Division, Agronomy Division, Tissue Culture Division, Genetics and Plant Breeding Division, Soils and Plant Nutrition Division, Coconut Processing Research Division, Agricultural Economics and Agribusiness Management Division

Even under the pressure of COVID 19 situation and fuel crisis, this program was completed successfully. During the year, eight programs (coordinated by the Technology Transfer Division) were conducted but only the first and the final programmes were conducted physically. The rest of the programmes were conducted on virtual base using Zoom platform due to fuel crisis prevailed in the country.

Research Extension Dialogues

Technology Transfer Division

The Technology Transfer Division has conducted two research extension dialogues via Zoom technology to the field extension staff of Marawila, Kurunegala, Kuliyapitiya, Kegalle and Gampaha Regional Manager Divisions (RM regions) of the Coconut Cultivation Board on 20th July and for the Coconut Development Officers of Galle, Matara, Hambantota, Kalutara, Monaragala and Ratnapura RM regions on 28th September respectively.

Training Programme on Value Added Coconut Products

Technology Transfer Division

During the year, six training programmes (156 trainees) were conducted for youths, women organizations and rural entrepreneurs jointly with the Caritas Sri Lanka (Non-Governmental Organization) and Vidhatha Centers.

Distribution of leaflets through Sunday newspapers

Technology Transfer Division

The division has distributed 20,500 leaflets on different messages in Kamburugamuwa, Ahangama, Galle, Negombo, Kochchikade, Kandana, Ja-ela, Seeduwa, Kegalle and Polgahawela areas.

School educational programmes

Technology Transfer Division

CRI has become one of the popular scientific learning destinations among the school children for their educational tours. During the year, due to fuel crisis only 5 schools (580 students and teachers) visited the institute.

Educational Programmes for universities and higher educational institutions

Technology Transfer Division

The division conducted six practical training programs for students from universities and higher educational institutions.

Universities	Agricultural Schools
National Institute of Plantation Management	Gabadawatte Agriculture School
University of Wayamba	Walpita Agriculture School
The Open University	Technical College - Warakapola College

Exhibitions and crop clinics

Technology Transfer Division

The division attended three exhibitions and crop clinics in Colombo, Chilaw and Bothalegama areas during the year to promote coconut cultivation, management and processing technologies.

Printing and Publications

Technology Transfer Division

During the year, following printing materials have been published.

I. Kapruka Athpotha

II. Pol Pawath

III. Short Annual Report 2020

IV. Certificate course book 1 & 2

The printing unit of the division undertook 64 printing jobs of other divisions which cost Rs. 848,320.00. This includes annual reports, booklets, leaflets, official forms, circulars, various kinds of forms, datasheets, survey questionnaires, certificates, folders and handouts etc.

Coconut Technology Park (CTP)

Technology Transfer Division

Coconut Technology Park (CTP) at Bandirippuwa estate which is maintained by the division is very popular among the coconut growers, school children and the general public. In 2022, a limited number of visitors visited the CTP due to the fuel crisis and Covid situation in the country.

Technology transfer activities conducted by the Crop Protection Division

Special awareness programs on whitefly control in coconut

Special awareness programs were conducted using electronic, social and printed mass media on several aspects on whitefly control in Sri Lanka. The staff of the Crop Protection Division and the Deputy Director (Research I) participated in the programs. Several stakeholders such as coconut growers, industrialists, officers of the Coconut Cultivation Board, Chilaw Plantations Ltd., Kurunegala Plantations Ltd. and the Department of Agriculture were trained on identification and control of the whiteflies in coconut.

Fig 02. Whitefly awareness programs conducted by the Coconut Research Institute

Table 01. Details of the awareness programs conducted on whitefly control

Date	Location	Participants
06.10.2022	Batuwatta, Ragama	Awareness program for coconut growers, and CDOO in the Gampaha area
11.10.2022	CRI	Media recording (Awareness program to TV broadcast)
13.10.2022	CRI	Training program for officers of Chilaw Plantations. Ltd
17.10.2022	Kegalle	Awareness program for coconut growers and officers relevant to the coconut industry
21.10.2022	Kalutara	Training program for officers of DOA in the Kalutara area
01.11.2022	Wariyapola	Awareness program for a private company (Tropicoir)
15.11.2022	Galle-CCB	Training program for CDOO and DOO at the Galle regional office of CCB
16.11.2022	Dankotuwa	Inauguration ceremony of the whitefly control pilot program
17.11.2022	CRI	Training programme for two private companies: Riococo Lanka (Pvt) Ltd and Adamjee Lukmanjee Exports (Pvt) Ltd
08.12.2022	Rathmalana	Awareness program for Agriculture Instructors of DOA in the Colombo Area
09.12.2022	Wennappuwa	Inauguration ceremony of the whitefly control pilot program
16.12.2022	Nattandiya	Inauguration ceremony of the whitefly control pilot program

Campaign model pilot scale control programme for whitefly

A campaign model pilot scale spraying program was conducted in Dankotuwa, Wennappuwa and Naththandiya District Secretariat Divisions with the collaboration of the Coconut Cultivation Board for the control of whitefly. Several public sector organizations such as Sena Mill Refineries, TropiCoir Lanka Pvt Ltd., Ceylon Desiccated Coconut Manufacturers Association and Ceylon Biscuits Ltd provided assistance in different ways to make this program a success.

A total of 16,069 palms were sprayed with the neem oil and soap mixture in this program.

Newspaper articles

Four newspaper articles were published in “Silumina”, “The Island”, “DailyNews” and “The Sunday Times” NewsPapers during 2022,. The articles covered scientific and general details of Whitefly damage and Weligama Coconut Leaf Wilt disease.

Daily News epaper

Whitefly a growing threat to coconut and other crops

PRIYAN DE SILVA

The Whitefly species (*Aleyrodidae*) is becoming a growing threat to coconut and other agricultural crops in Sri Lanka.

Whiteflies damage plants by sucking out plant juices. Heavily infested plants can be seriously weakened and grow poorly. Leaves often turn yellow, appear dry and drop prematurely. Whiteflies also transmit crop viruses.

Coconut Research Institute (CRI) Deputy Director (Research) Dr. Nayanie Aratchige says that around 1,500 species of the whitefly have been reported from around the world, of which four species, *Aleurotrachelus atratus* (palm-infesting whitefly), *Paraleyrodes minei* (citrus nesting whitefly), *Aleurodicus disperses* (spiraling whitefly) and *Aleurodicus cocois* (coconut whitefly) are presently a threat to coconut palms in Sri Lanka.

Dr. Aratchige said that the first mention of the whitefly plaguing coconut palms was in Barbados in 1846 and outbreaks have been reported in the Caribbean and South American regions since the 1990s. Outbreaks of rugose spiraling whitefly (*Aleurodicus rugioperculatus*) have been reported in India since 2016.

The species *Aleurodicus* dispersus (spiraling whitefly) has been present in Sri Lanka since 1990, but at that time it was considered a minor pest to coconut palms when compared to other crops .

The first major outbreak in coconut plantations in Sri Lanka was reported in 2019 in the Kegalle district and may have been caused by the accidental introduction of a new

Dr. Nayanie Aratchige

species via illegal importation of seedlings of the *Palmae* group, impact of climate change, sudden drop of natural enemy populations of the native population of whiteflies due to excessive use of insecticides on other crops.

Dr. Aratchige said that Whiteflies have invaded coconut plantations in the Gampaha, Kegalle,

A coconut leaf infested by whiteflies.

Kandy, Kalutara, Colombo, Kurunegala, Ratnapura, Puttalam and even the Galle, Matara and Hambantota districts which have been battling the Weligama Coconut Leaf Wilt disease for over a decade.

Banana, guava, citrus fruits, avocado, eggplant, okra, cashew, Indian almond (*kottamba*), *kithul* palm, areca nut, ornamental plants, curry leaves, green chilli, mango, jackfruit, breadfruit, *neem*, pigeon pea, different varieties of pepper, water melon, coffee, etc., host the whitefly.

The CRI and the Coconut Cultivation Board are conducting awareness programmes on identification of the pest and coordinated spraying of insecticides.

Dr. Aratchige said that placing yellow sticky traps or spraying insecticides to control the menace is recommended. Neem oil and soap mixture is recommended for all infested areas as this mixture is less toxic to the natural enemies of whiteflies. Artificial insecticides are particularly recommended for newly infested areas and the coconut seedling nurseries.

The CRI is researching on methods of chemical and biological control and have sought assistance from other countries for importation of exotic natural enemies of the whitefly.

13/12/2022 Daily News Pg 04

Fig 03. A newspaper article on whitefly

Mass media programmes

The officers of the Crop Protection Division and the Deputy Director (Research I) participated in three “Subarathi” radio programs and “Shanida Ayubowan”, “Hath weni Paya” and “Big Focus” television programs to disseminate information among general public on the whitefly damage.

Fig 04. Television programs on whitefly, Fig 05. "Subharathi" Radio programs on whitefly

Technology Transfer Activities for Weligama Coconut Wilt Disease

Mr. P.H.P.R. De Silva conducted four training programs for Field Inspectors, Field Officers, Coconut Development Officers and Development Officers of the Coconut Research Institute and the Coconut Cultivation Board on "Symptoms identification of Weligama Coconut Leaf Wilt Disease".

Fig 06. Training programs on Weligama coconut leaf wilt disease

Technology transfer activities conducted by the Coconut Processing Research Division

The staff of the Coconut Processing Research Division in collaboration with Technology Transfer Division conducted several programs for dissemination of knowledge on coconut kernel-based products. The programs were conducted at Katuneriya on 2022.03.18, Marawila on 2022.08.04, Chilaw on 2022.03.05 and Ja-Ela on 23.09.2023.

Dr. Chandi Yalegama participated in Nugasevana, Live program broadcasted by Sri Lanka Rupavahini cooperation on 17th May, 2022 on “Use of coconut milk for domestic use”..

Dr. Chandi Yalegama participated in an interview/ Discussion (recorded) broadcasted over “saruketha” radio channel on “pol walin aadhaayama vadikara ganiima”, 30th July, 2022.

CONTRIBUTION TO NATIONAL DEVELOPMENT THROUGH SERVICES TO STAKEHOLDERS

Test Reports and Fertilizer Recommendations

Central Analytical Laboratory

Central Analytical Laboratory (CAL) was ceremonially opened on 04th April 2022 to serve its clients as well as CRI researchers. Currently this laboratory is equipped with inductively coupled Plasma spectrometer (ICP), atomic absorption spectrometer, gas chromograph (GC) and microwave digester analytical facilities to provide services. More than 50 metals of various sources such as fertilizer, food, water, soil, plant materials can be analyzed using ICP facility. Qualitative and quantitative measurements of volatile analytes of different matrices can be carried out with GC. Microwave digestion extraction of analytes facilitates accurate, efficient extraction for instrumental analyses.

During the year with the available resources, Central Analytical Laboratory was able to provide satisfactory service to the clients. Details of services offered are given in the Table.

Fig 01. Opening of the CAL

Fig 02. CAL Staff involved in analyses

Table 01. Number of services carried out during 2022 to clients and researchers

Test report/certificate name	No. of reports (samples analyzed)
Coir certificate	166 (830)
Differential fertilizer recommendation	13 (66)
Food	32(206)
Organic Manure	14(64)
Inorganic fertilizer	10(25)
Coconut plant parts analysis	1(2)
Combined fertilizer	3(5)
Leaf	1(10)
Soil	5(15)
Water	1(1)
Waste water refinery	1(2)
Total number of Client's samples analyzed	1226
Total number of Research samples analyzed	978
Total number of samples analyzed during 2022	**2204**

Seedling certification and maintaining private registered nurseries

Genetics and plant Breeding Division

Coconut seedling certification process was severely affected by the shortage of certification stickers and the fuel crisis prevailed in the country during the year 2022. However, certification process was continued with the limited stocks of certification stickers and only 43,730 CRIC60, 36,730 CRIC65, 2165 CRISL98, 628 Kapruwana, 1324 Kapsuwaya, 707 Kapsetha and 339 CRISL2020 seedlings were certified during the year.

Fifty-five registered private nurseries throughout the country were managed to distribute high-quality polybagged CRIC60 seedlings to growers. In 2022, 192,100 CRIC60 seed nuts were provided to these nurseries.

Fig 03. Certified coconut seedlings

Issuing of Dikiri Coconut Seedlings

Tissue Culture Division

About 680, in vitro raised dikiri plants were acclimatized during the year and 300 plants were issued to growers.

Fig 04. Dikiri plants in the acclimatization stage

Estimation of National Yield of 2021 and Prediction of National Yield of 2022

Plant Physiology and Agricultural Economics and Agribusiness Management Divisions

The estimated national coconut production in 2021 was 3382.9 Mn nuts. It was about 20% increase compared to the production in 2020 (2818.1 Mn. Nuts). The predicted coconut production for 2021 was 3353.1 ± 29.3 Mn nuts which ranged from 3,323.8 to a maximum of 3,382.4 Mn nuts. Therefore, the actual production was only 1% higher than that of the predicted value and well within the acceptable range.

One volume of the brochure with above information along with the district-wise climatic parameters were printed and circulated among relevant officials, growers and entrepreneurs. In addition, bi-monthly updates of National Coconut Production and the forecast for the remaining months were provided to the all stakeholders through e mails on request.

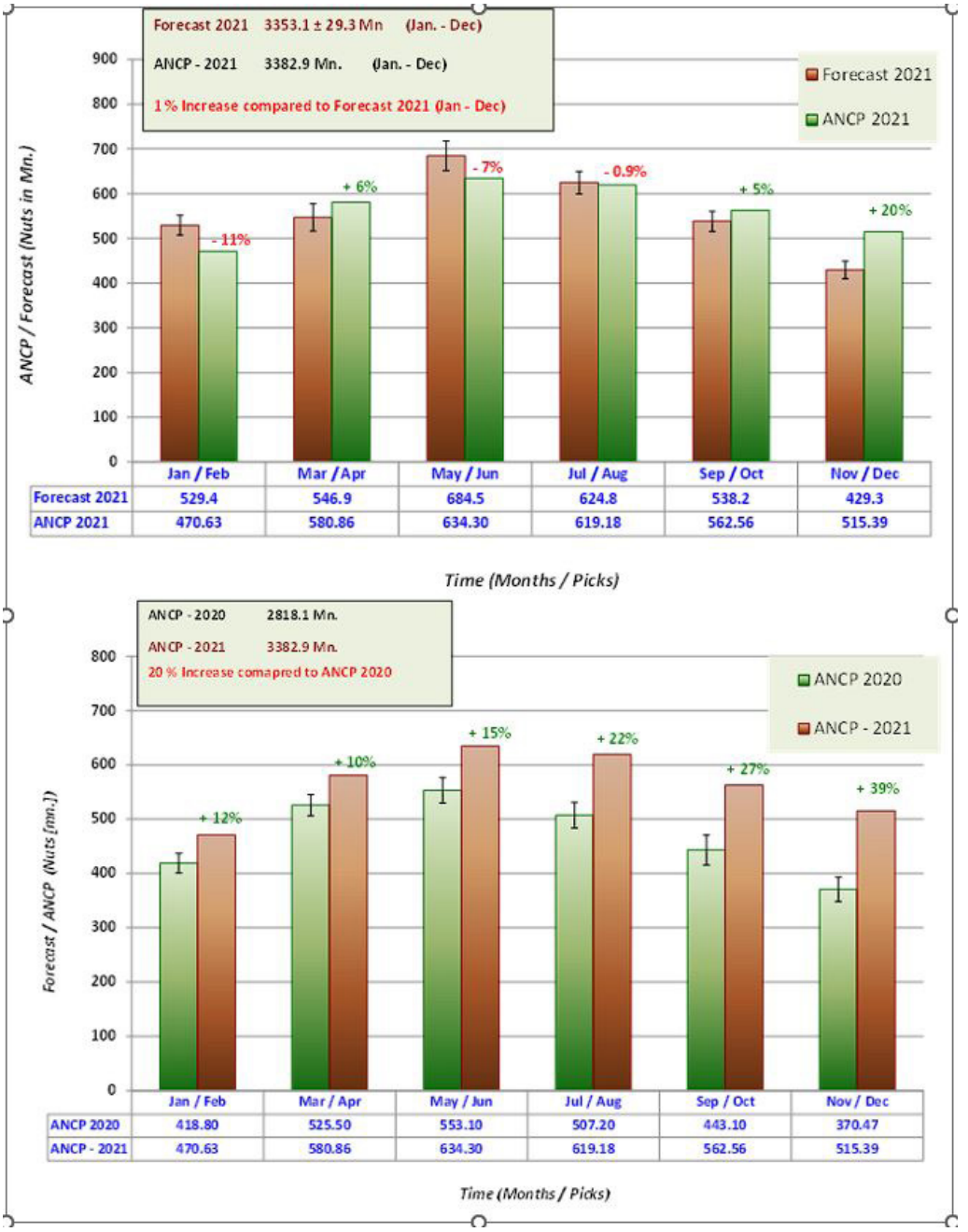


Fig 05. Comparison of the actual Annual National Coconut Production (ANCP) on bimonthly basis for 2021 with the forecast and (b) its comparison with ANCP 2020

Supply of Meteorological data

Plant Physiology Division

Daily data of rainfall, air and soil temperature, relative humidity, wind velocity and sunshine hours of five research stations of CRI; BE, RE, ISG, MOSG and MRS were provided to the national database at the Department of Meteorology. Monthly rainfall and temperature data were provided to growers, industry personnel, scientists, students and Divisional Secretariats of Wennappuwa, Mahawewa, Madampe and Dankotuwa (for updating "Sampath Pethikada") on their requests.

Fig 06. Agro-meteorological Station at Bandirippuwa Estate

Supply of the protocol for the improvement of shelf life of king coconut for export markets

Plant Physiology Division

The protocol developed for the improvement of shelf-life of king coconut was disseminated to more than 60 exporters during the year. The export of king coconut for more than 25 countries in the world has shown a steady growth in previous years of which the export volume has exceeded well above 9 Mn nuts. The total king coconut exports for 2022 was 10.87 Mn nuts which attracted more than Rs. 2,000 Mn. during the year.

Fig 07. Export of king coconuts during past 13 years using the protocol developed by CRI

Production of predatory mites for the control of coconut mite

Crop Protection Division

Production of predatory mites for the control of coconut mite was continued. 22,570 predator mite sachets were produced in the Coconut Research Institute predator mite laboratories and 15,564 sachets were sold to the growers.

Crop Protection Division also provided technical guidance to the predator mite laboratories maintained by the Coconut Cultivation Board.

Maintenance of protective zone for the prevention of spreading of Weligama Coconut Leaf Wilt Disease in the country

Crop Protection Division

The diseased palm removal program of the Weligama Coconut Leaf Wilt Disease (WCLWD) was continued. The Coconut Research Institute involved in the palm marking and removal program in the protective zone. A total of 24,577 lands in the Southern Province were inspected in the protective zone management program which covered the land area of 21,487.23 ac. 3,542 disease affected palms were identified and 1975 were removed. 992 unremoved palms were injected with Glyphosate and killed.

Breeding of parasitoids to control the coconut caterpillar

Crop Protection Division

Crop Protection Division continued the breeding of parasitoids in the insectary for the management of coconut caterpillar outbreaks. A total of 882,315 parasitoids were released to coconut caterpillar infested estates.

Synthesis and sale of pheromones for the management of red palm weevil

Crop Protection Division

Laboratory of the Crop Protection Division synthesized 919 vials and 960 gel sachets of red palm weevil aggregation pheromone and sold 990 pheromone vials including vials from previous year's stock and 444 improved gel pheromone sachets to the growers and the Coconut Cultivation Board.

Coordination of importation of Monocrotophos 60 SL

Crop Protection Division

Coconut Research Institute coordinated the importation of 2000 liters of Monocrotophos 60% SL and handed over to the Coconut Cultivation Board for the management of red palm weevil infestations.

"Kapruka" SMS Service

Technology Transfer Division

The Kapruka" SMS Service which was started as a pilot project in 2015 has become very popular among the coconut growers and coconut traders. The registered clients receive messages on farm gate price of a coconut, DC price, Copra price, Coconut oil price bi-weekly and the yield prediction for the following month. During the year 2022, registered stakeholders have received 87,857 messages.

Kapruka Information Centre

Technology Transfer Division

The Technology Transfer Division introduced 1928 hot line service and 070-4001928 WhatsApp number to the stakeholders during the year 2021. They have become very popular among coconut growers to obtain technical advice and information. The number of calls and WhatsApp messages received during the year were 14,931.

Provide advisory services to growers

Technology Transfer Division

During the year, the Technology Transfer Division received approximately 650 telephone calls and letters requesting technical advice and information. Most of the general requests were referred to the respective Regional Managers of the Coconut Cultivation Board for their action. The division was able to make only 7 estate advisory visits and submit reports with necessary recommendations due to fuel crisis in the country

Technology dissemination through mass media 2022

Technology Transfer Division

Radio Programmes

- Five "Subarathi" radio discussion programmes (one hour each) on coconut cultivation were broadcasted on "Sinhala National Service" of Sri Lanka Broadcasting Corporation on 08th & 22nd March, 5th & 19th April and 26th October.

Radio Advertisements

- 170 radio advertisements were broadcasted on "Sinhala National Service" and "Commercial Service" as News in Brief (Intro and Extra).

- 3690 radio advertisements were broadcasted on "Sinhala National Service", "Commercial Service", "City FM", "English Service", "Thendral FM", "Tamil National Service", "Ruhunu FM", "Kandurata FM", Rajarata FM", Wayamba FM", Pirei FM and "Yaal FM" as Development News (Intro and Extra).

TV Advertising and Programmes

- 66 TV advertisements on coconut cultivation were telecasted on Rupavahini TV channel.
- 54 TV advertisements on coconut cultivation were telecast on ITN TV channel.

Practical training sessions conducted by the Coconut Processing Research Division for entrepreneurs

Three practical trainings on virgin coconut oil, white coconut oil production, coconut milk, coconut water and vinegar production processes were conducted at the incubation center during 2022 and thereby about 400 people were trained.

Seventy-three entrepreneurs, who were seeking different coconut-based technologies, visited the incubation center seeking knowledge on products and they were educated at the initial stage of starting business.

Library Services

The library of the Coconut Research Institute continued to provide library services to the stakeholders.

NATIONAL COLLABORATIONS

Memoranda of Understanding

1. The Coconut Research Institute signed two separate Memoranda of Understanding with CIC Holdings PLC and Lankem Ceylon PLC for the commercialization of the Red weevil gel pheromone

2. The Coconut Research Institute signed a Memorandum of Understanding with Sri Lanka Army for the Establishment of a seed garden for CRIC60 seednut production at Kandakadu farm

3. Memorandum of understanding between Coconut Research Institute and National Institute of Fundamental studies to carry out research on "Anti-oxidative and anti-diabetic activity of partially defatted coconut paring of indigenous coconut cultivar of Sri Lanka" was continued.

4. Memorandum of Understanding among the Coconut Research Institute, NERD, Export Development Board, Coconut Development Authority and coir industries to develop a dryer for coir pith drying and a britle fibre extraction machine, similar to Ceylon drum machine, was continued.

ESTATE MANAGEMENT ACTIVITIES

ESTATE MANAGEMENT DIVISION

(Seed Garden/ Research Centers)

Estate Management Division (EMD) of Coconut Research Institute (CRI) is the managing division of four Genetics Resource Centers and seven Research Centers belong to the institute. Total extent of all CRI estates is 3,148 ac and out of which 1,980 ac. are Genetic Resource Centers and 1,168 acres are operated as Research Centers.

The Estate Management Division was maintained satisfactorily as a self-financed division without depending on treasury funds.

The primary objective of the division is to maintain Genetic Resource Centers to provide high quality seed nuts to Coconut nurseries in the main coconut growing areas of the country. Further, the division provides facilities for the research divisions to carry out research under various conditions, i.e., under different soil types, different agro-ecological conditions, with different coconut cultivars and growing stages etc.

Table 01. Areas of Research Centres. Genetic Resource Centres

Name of the CGRC/ RC	Main Objective	Extent/ ac.	Remarks
Makandura RC	Research Centre	145	
Rathmalagara RC	Research Centre	251.1	
Walpita RC	Research Centre	40	
Poththukulama RC	Research Centre	194	
Bandirippuwa RC	Research Centre	360.16	
Middeniya RC	Research Centre	75.55	
Thabbowa RC	Research Centre	6.96	
Ambakelle CGRC	Seed Garden	347.8	Forest area 828 ac
Maduruoya CGRC	Seed Garden	205.1	
Pallama CGRC	Seed Garden	623	
Weligama CGRC	Seed Garden	17.02	

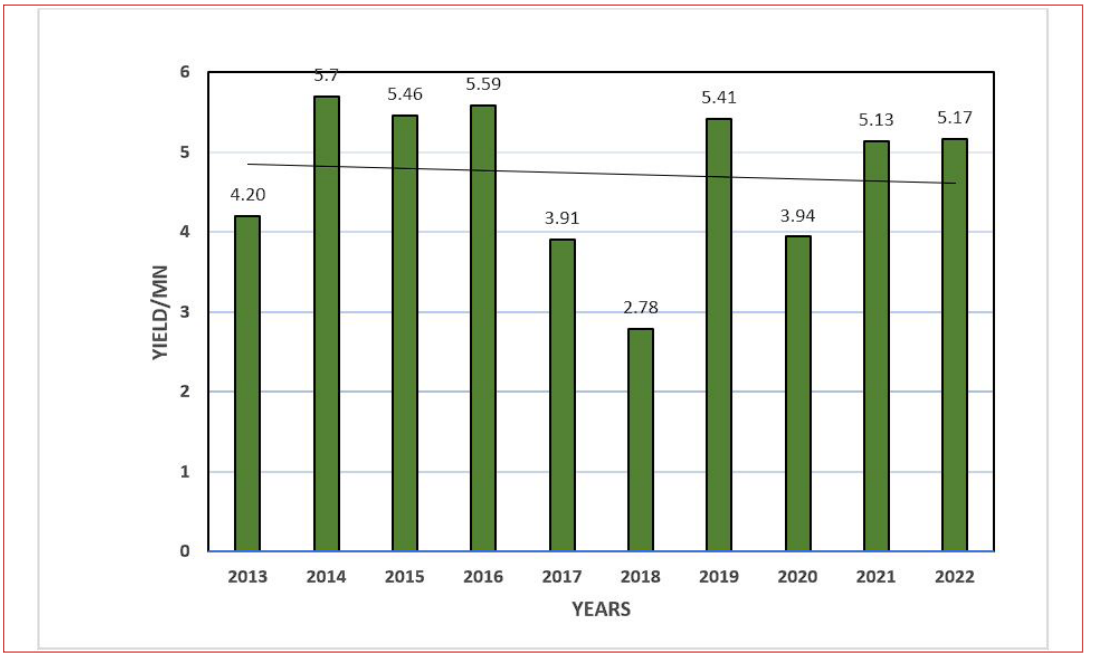


Fig 01. Location Map of CRI estates and variation in coconut production in CRI estates from 2013 to 2022

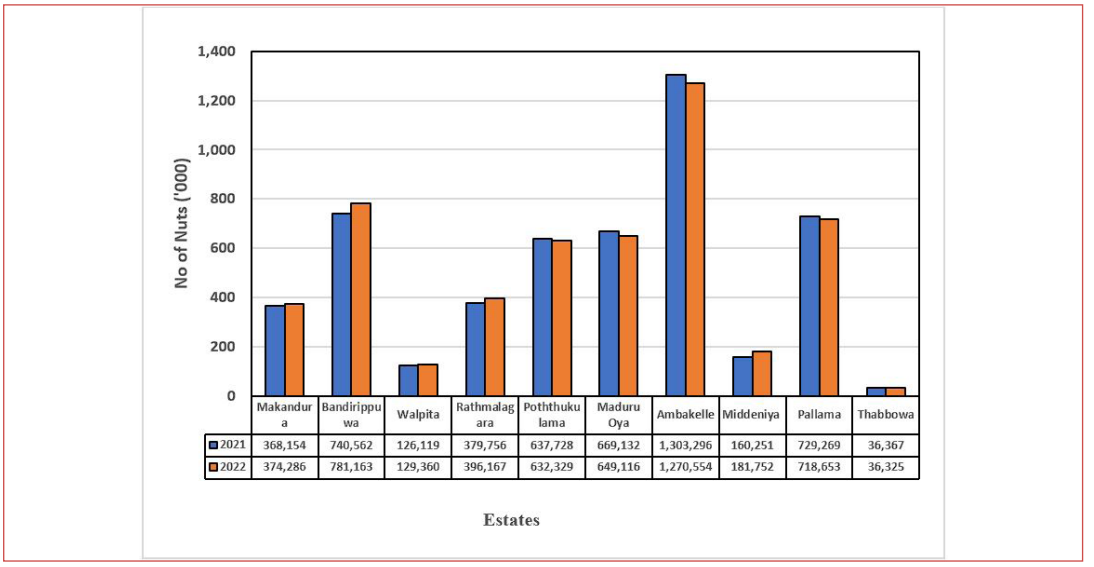
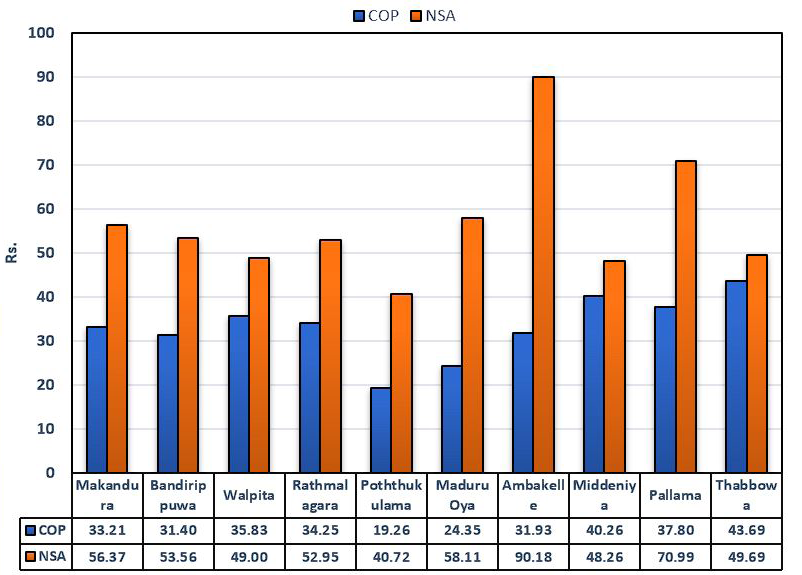


Fig 02. Total coconut production in CRI Estates in 2021 and 2022

The total coconut production of all CRI estates in 2022 was nearly 5.17 million nuts. Majority of those nuts were sold through the auction conducted by the Coconut Development Authority.



	Makandura	Bandiripuwa	Walpita	Rathmalagara	Poththukulama	Maduru Oya	Ambakelle	Middeniya	Pallama	Thabbowa
COP	33.21	31.40	35.83	34.25	19.26	24.35	31.93	40.26	37.80	43.69
NSA	56.37	53.56	49.00	52.95	40.72	58.11	90.18	48.26	70.99	49.69

Fig 03. Cost of Production (COP) and Net Sale Average (NSA) of different estates in 2022

The average cost of production (COP) of all estates was Rs.33.20 per nut while Net Sale Average (NSA) was Rs. 56.98. accordingly, the net profit of the all estates was around Rs. 130 million in the year 2022.

Seed Nut Production in CRI Seed Gardens and Research Centers

Ambakelle, Maduruoya and Pallama Genetic Resource Centres are governed by the EMD with the objective to produce different types of quality coconut seeds to the plantation sector.

Special blocks were maintained in Ambakelle and Pallama Genetic Resource Centers to produce CRIC 65 (DT) seeds to cater the extensive home garden development program. A hand pollination program was started as a special project.in Rathmalagara, Maduruoya, Middeniya and Bandirippuwa estates in 2022 to produce hybrid seed nuts using funds allocated by ministry of plantation. Thereby, it is expected to increase the hybrid seed nut production and fulfill the huge national demand for the hybrid seedlings in years to come. In the year 2022, 1.35 and 0.165 million seed nuts of CRIC 60 and CRIC65 respectively were issued to the Coconut Nurseries. By hand pollination program, 4,142 seed nuts of Kapruwana, 6,828 seed nuts of Kapsuwaya, 4,647 seed nuts of Kapsetha 3,215 seed nuts of CRISL 2020 (T x MRD) and 11,459 of CRISL98 (T x SR) were issued to the Coconut Nurseries maintained by CRI in 2022.

The plus palm seed nuts were produced only in Walpita Research Center and 29,928 seed nuts were issued to the Coconut Nurseries in 2022.

A total of 105,527 coconut seedlings were issued from nurseries maintained by CRI in 2022.

Practices of cattle, buffalo, goat and sheep farming were conducted in CRI estates and it facilitated the production of organic manure within the estate while controlling weeds with a low cost. Usual agronomic practices such as weeding, husk burring, maintaining contour drains, picking, pest and diseases control, mulching, fertilizer application, irrigation and maintaining rain water harvesting ponds were followed according to the schedule.

Dud and weak palms were removed in plantations and chemical fertilizer was applied only up to 50% of coconut palms in all the estates due to the unavailability inorganic fertilizer in the market.

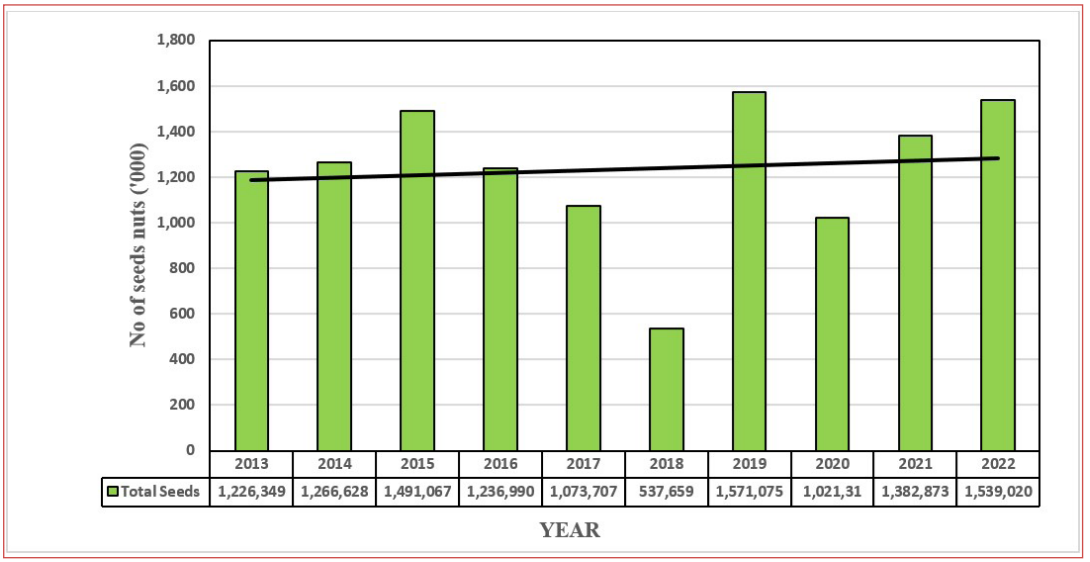


Fig 04. Total seed production in all CRI estates from 2013 to 2022

Summary of annual census of all estates in 2022

Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedling	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
18,346	**46,748**	**6,552**	**2,354**	**9,966**	**3,362**	**2,818**	**2,420**	**18,316**

As per the census, total palm population of all estates was 92,566 except the palm vacancies. In this census categories, Unproductive Senile, Dud and Weak Palms which amounts to about 9 %, are not benefited to the estates are to be removed in coming years. Palms which are contributing to the yield (Well bearing, Bearing and partial bearing palms) covers about 77.4 % of the total.

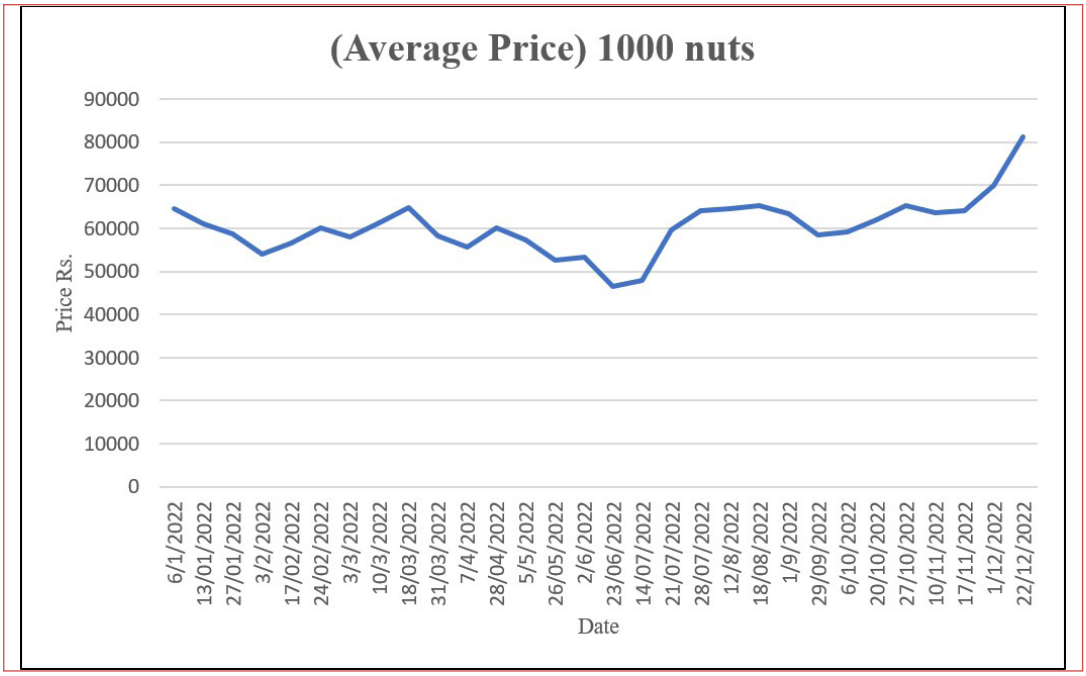


Fig 05. Average auction price fluctuation per 1000 nuts in 2022

Coconut Genetic Resource Centre Ambakelle (CGRC Ambakelle)

Agro Ecological Zone	IL1b
Extent/ac	1175.8

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	12,302	-	475	1,586	3,810	-	528	-	1,020
%	62.38	-	2.41	8.04	19.32	-	2.67	-	5.18
%	62.38		10.45		19.32		7.85		

Annual Coconut census of the estate

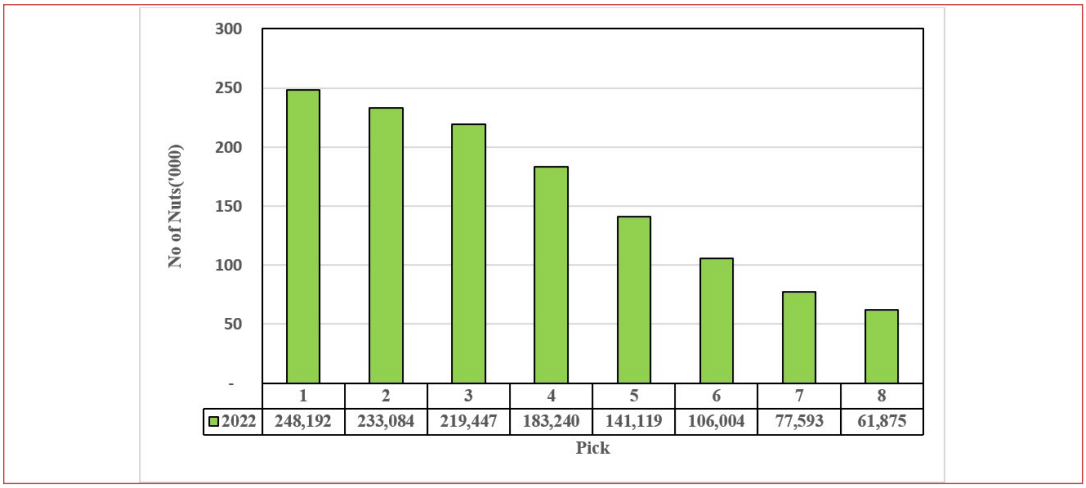


Fig 06. Coconut production in 2022

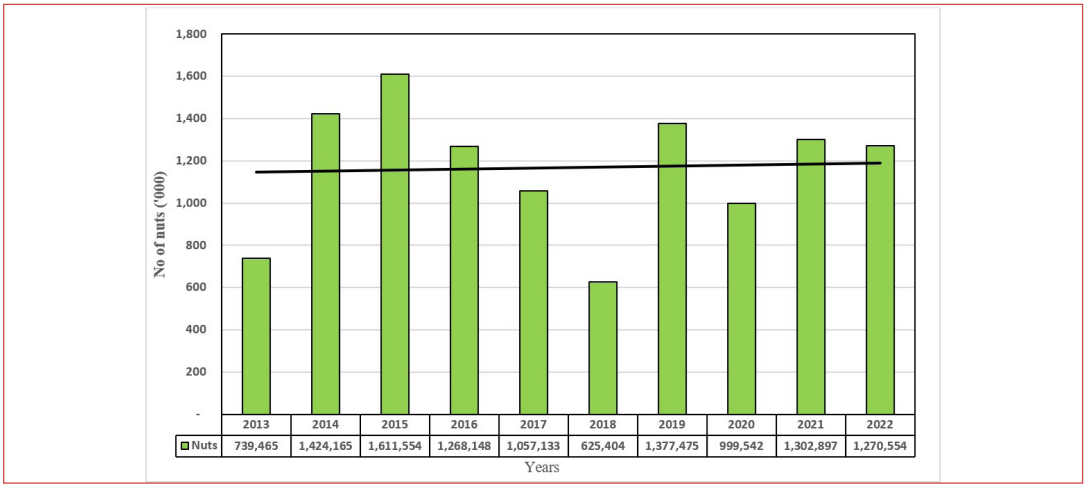


Fig 07. Variation in coconut production in previous years

The total coconut production during the year 2022 was 1.27 million, which was about 2.5% decrease compared to that of the previous year. The total number of seed nuts issued was 1.06 million.

Total rainfall during the year was 1127.8 mm. General maintenance was conducted satisfactory during the year. A total of 1250 husk pits and 825 Coconut pits were completed during the year. Weeding, mulching and other cultural practices were duly attended.

Twenty-six buffalos were sold and 32 buffalos were maintained as an extensive system for grazing and thereby controlled the grassy weeds with a low cost. One acre of turmeric and 600 grafted lime plants were planted in 2022.

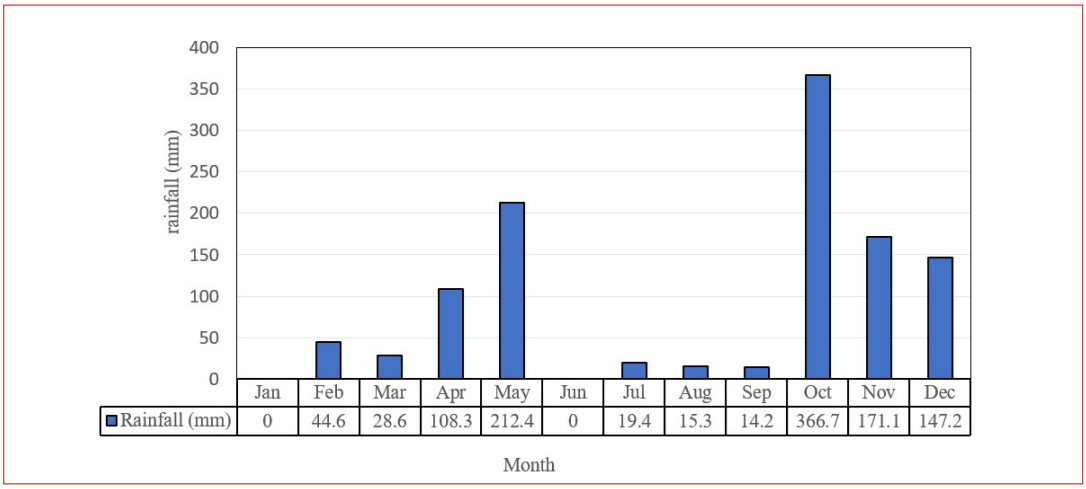


Fig 08. Monthly rainfall (mm) in 2022

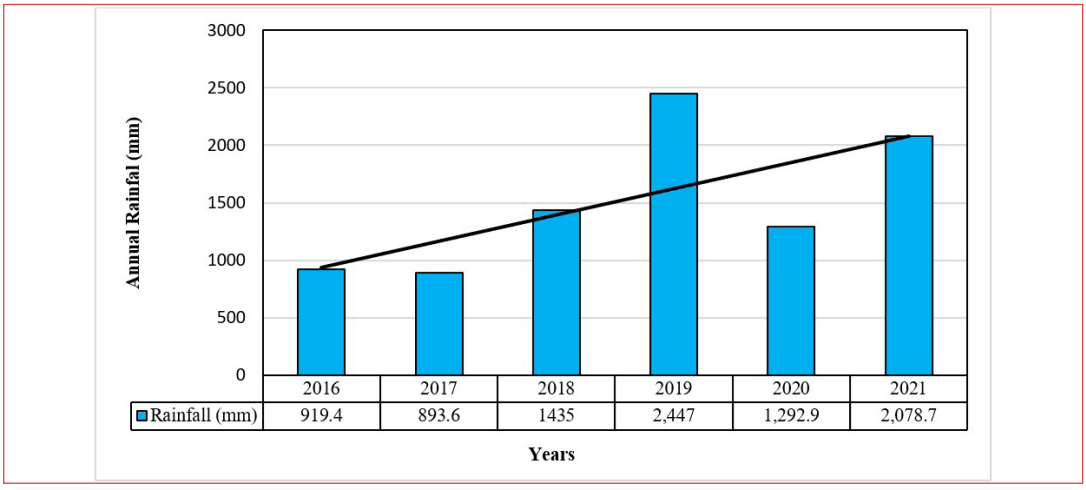


Fig 09. Variation in annual rainfall (mm) in previous years

Seed nuts of CRIC60, Ambakelle Special and CRIC65 are being produced by control environment method and Kapruwana, CRISL 2020 seed nuts are also produced by hand pollination technology. Seed production in 2022 was as follows,

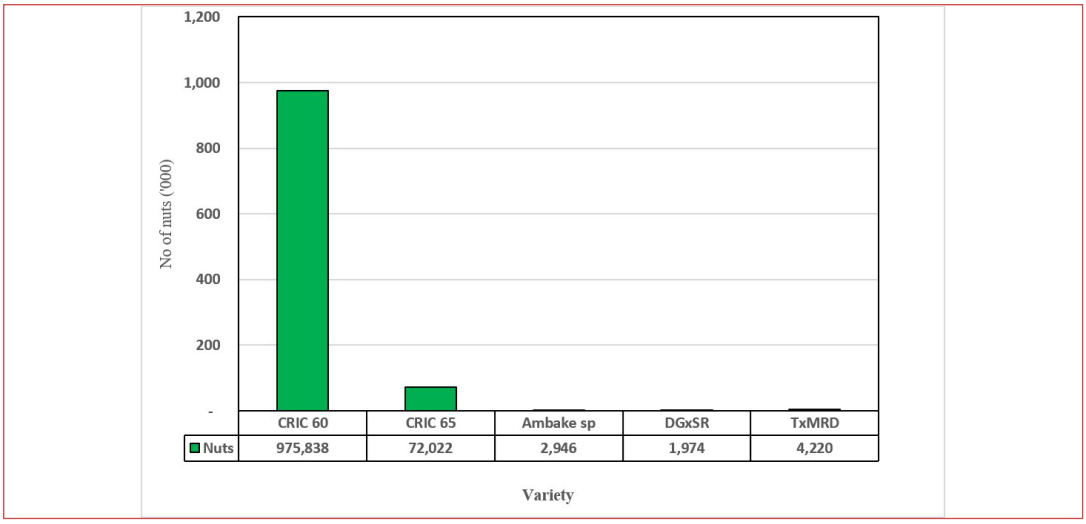


Fig 10. Seed nut production of different varieties in 2022

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	25.26	68.02
2022	31.93	90.18

Coconut Genetic Resource Centre Pallama (CGRC Pallama)

Agro Ecological Zone	IL1b
Extent/ac	623

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	508	9,679	383	173	129	505	1,058	1,736	9,446
%	2.15	40.98	1.62	0.7	0.5	2.13	4.47	7.35	39.99
%	43.13		2.32		0.5		53.94		

Annual Coconut census of the estate

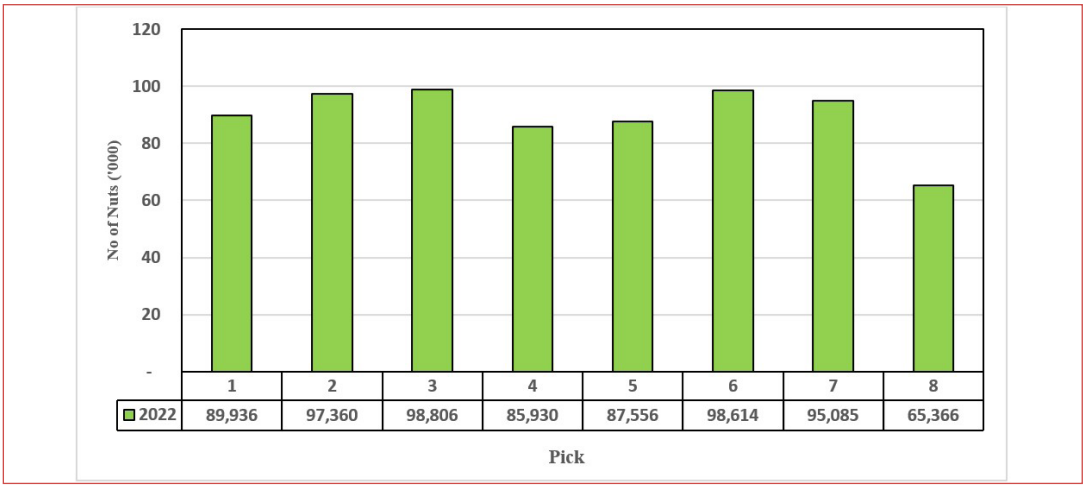


Fig 11. Coconut production in 2022

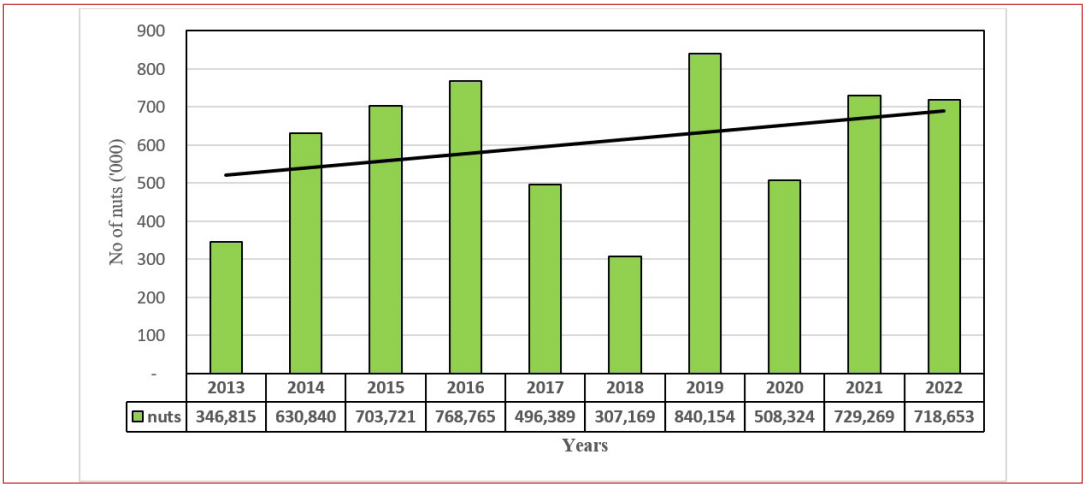


Fig 12. Variation in coconut production in previous years

A part of the estate was still in the developing stage as a seed garden for the mass production of seed nuts. Fifty acres covering some extents from field No. 07, 09 and 11 was cleared for the establishment of a new plantation.

The total production of nuts during the year 2022 was 718,653 which is about 1.5% decrease compared to that of the previous year. The total number of seed nuts issued was 81,681

(TSR= 11,459, DxT =57,079, SRxDG (Kapruwana)=1,668 , SRxDB (Kapsetha) = 4,647,

Tx DB (Kapsuwaya) = 6,828).

Total rainfall received during the year was 1093.5 mm which was about 36% reduction compared to the rainfall received in 2021. General maintenance was satisfactorily conducted during the year. A total of 1300 husk pits were completed in 2022. Under the intercropping programme, 240 grafted Orange plants and cinnamon plantation was established during this year.

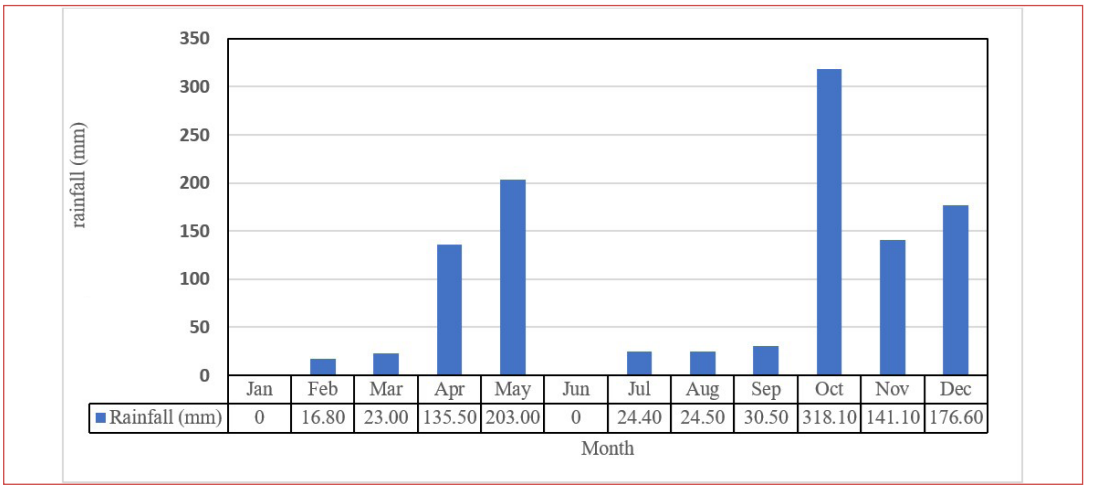


Fig 13. Monthly rainfall (mm) in 2022

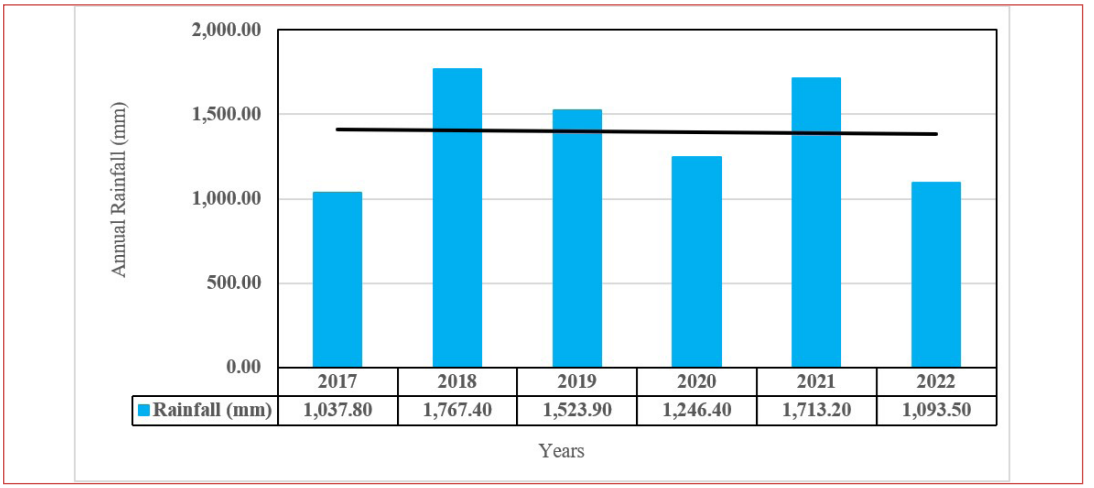


Fig 14. Variation in annual rainfall (mm) in previous years

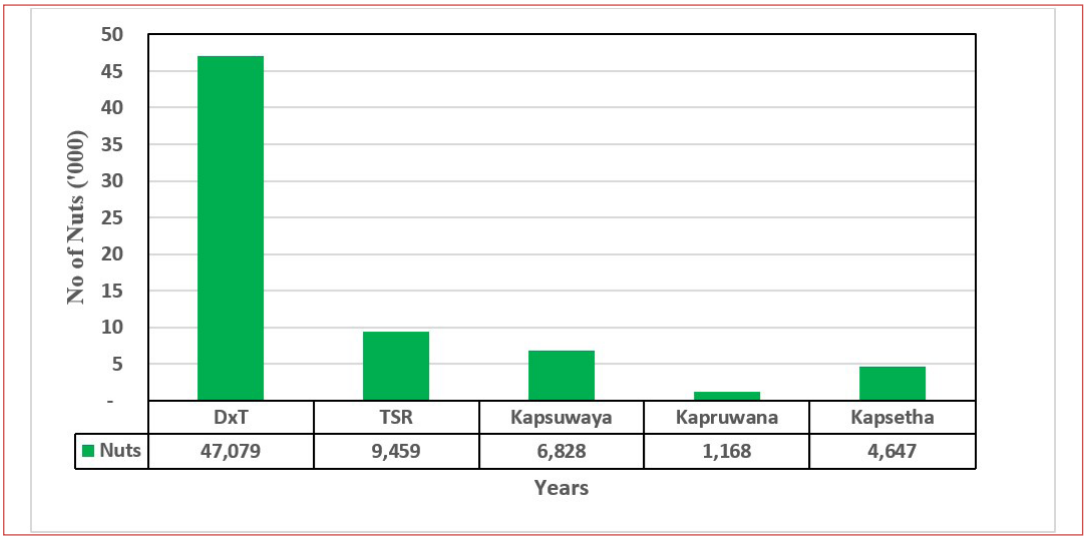


Fig 15. Seed nut production of different varieties in 2022

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	27.35	32.71
2022	37.80	70.99

Coconut Genetic Resources Centre Maduruoya (CGRC Maduruoya)

Agro Ecological Zone	DL2b
Extent/ac	205.1

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	3,885	2,154	1,857	54	22	67	-	15	277
%	46.63	25.85	22.29	0.6	0.2	0.8	-	0.18	3.32
%	72.48		22.89		0.2		4.3		

Annual Coconut census of the estate

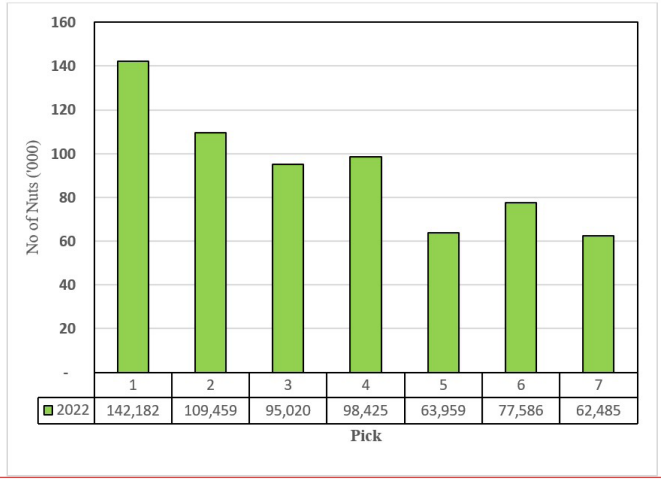


Fig 16. Coconut production in 2022

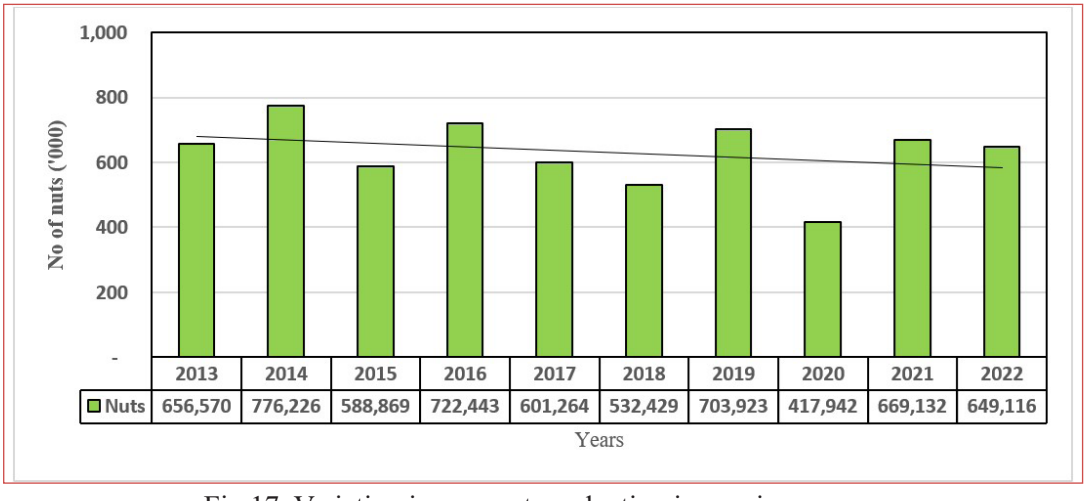


Fig 17. Variation in coconut production in previous years.

Maduruoya seed garden was established in 1985 to produce CRIC60 coconut seeds to the National Replanting Programme. This is also an Indonesian Type coconut seed garden and it is in Mahaweli System B area.

The seed garden was maintained to supply seed nuts to Coconut Cultivation Board nurseries and registered private nurseries.

The total coconut production in 2022 was 649,116 nuts, which was about 2.3% decrease compared to that of 2021. A total of 369,161 nuts were issued as seed nuts.

The performance of the seed garden was not affected by drought because of successfully implementation of the flood irrigation system by using normal and concreate truffe irrigation cannel structures.

The center maintained 75 buffalos for breeding purposes and milk production. Rainfall during the year 2022 was 1693.3 mm. Weeding, mulching and other cultural practices were duly attended.

New hand pollination programme was started using 500 coconut palms in 2022 with the objective to increase the production of hybrid seed nuts.

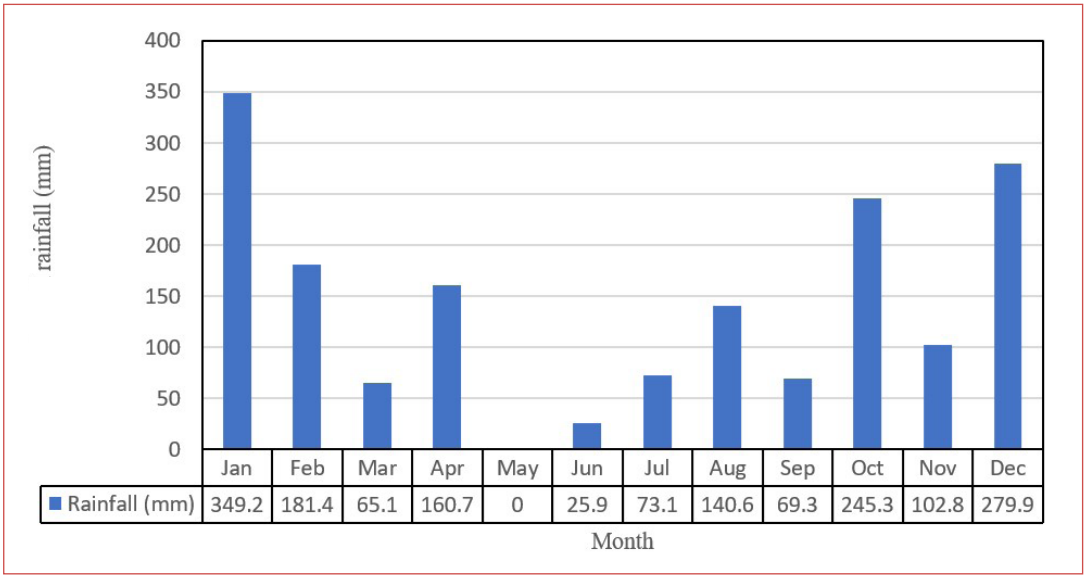


Fig 18. Monthly rainfall (mm) in 2022

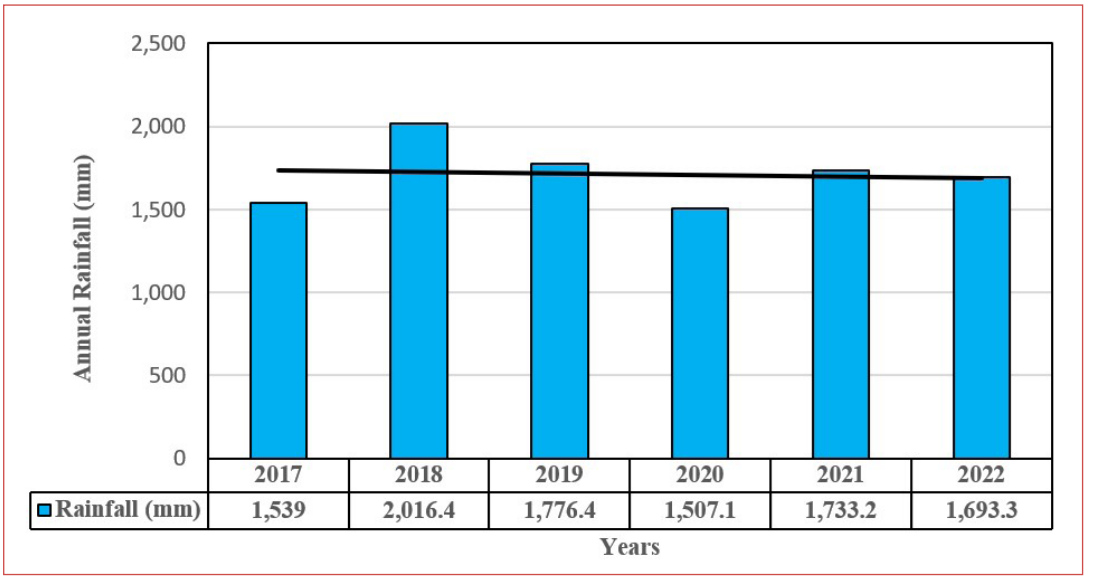


Fig 19. Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	17.45	64.40
2022	24.35	58.11

Coconut Genetic Resource Centre Weligama (CGRC Weligama)

Agro Ecological Zone	WL2a
Extent/ac	17.02

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	10	-	40	18	300	-	-	32	14
%	2.41	-	9.66	4.34	72.46	-	-	7.72	3.38
%	2.41		14		72.46		11.1		

Annual Coconut census of the estate

This estate was previously managed by Coconut Cultivation Board as a coconut nursery and later this land was acquired by the Coconut Research Institute on lease basis at the end of year 2016. Thereafter, several development activities were initiated with the funding facilities of WCLWD project in 2017. The main objective of the establishment of this Seed Garden was to produce WCLWD resistant / tolerant coconut seeds to the growers in Matara – Weligama WCLWD affected area.

Makandura Research Centre

Agro Ecological Zone	IL1a
Extent/ac	145

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	131	5,246	-	-	1,354	-	19	155	2,819
%	1.25	54	-	-	13.94	-	0.19	1.6	29.02
%	55.25		-		13.94		30.81		

Annual Coconut census of the estate

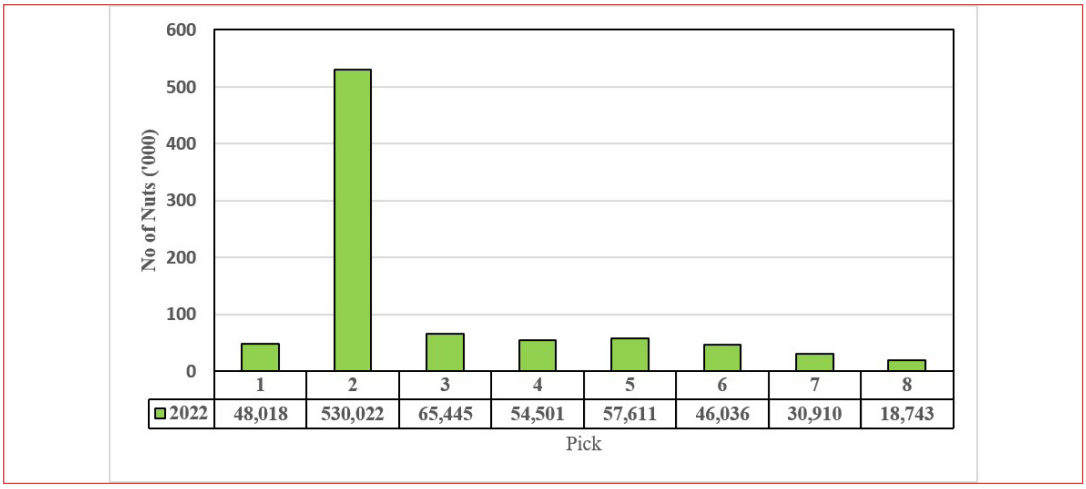


Fig 20. Coconut production in 2022

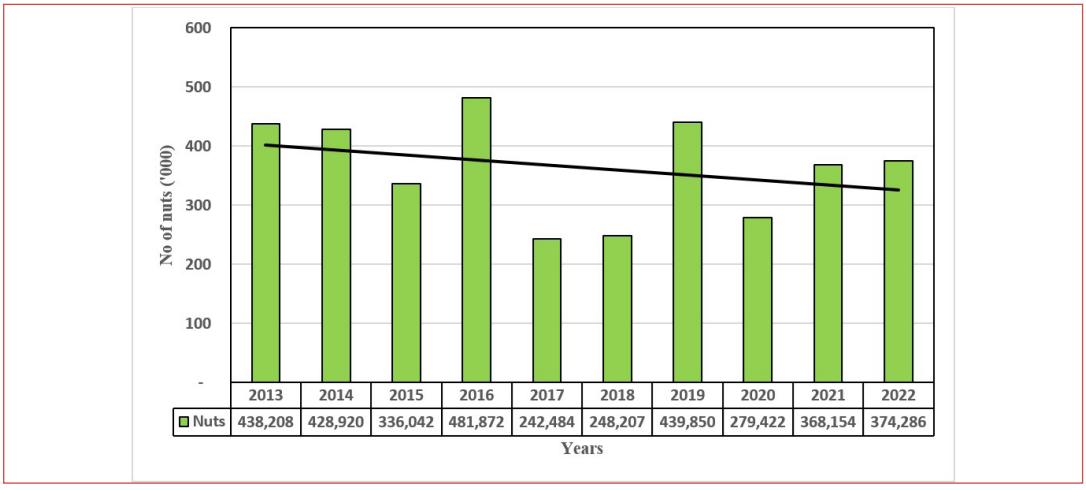


Fig 21. Variation in coconut production in previous years

The total yield was 374,286 nuts in 2022 and it was a slight increase of about 1.67 % compared to that of 2021.

The total rainfall received during the year was 1757.1 mm which was about 40% lesser than the rainfall received in 2021. However, it is comparable with those in recent years. General maintenance in the estate was satisfactorily conducted during the year. A total of 1000 husk pits and 920 coconut pits were completed during the year. One acre of cassava and 150 banana plants were planted in 2022.

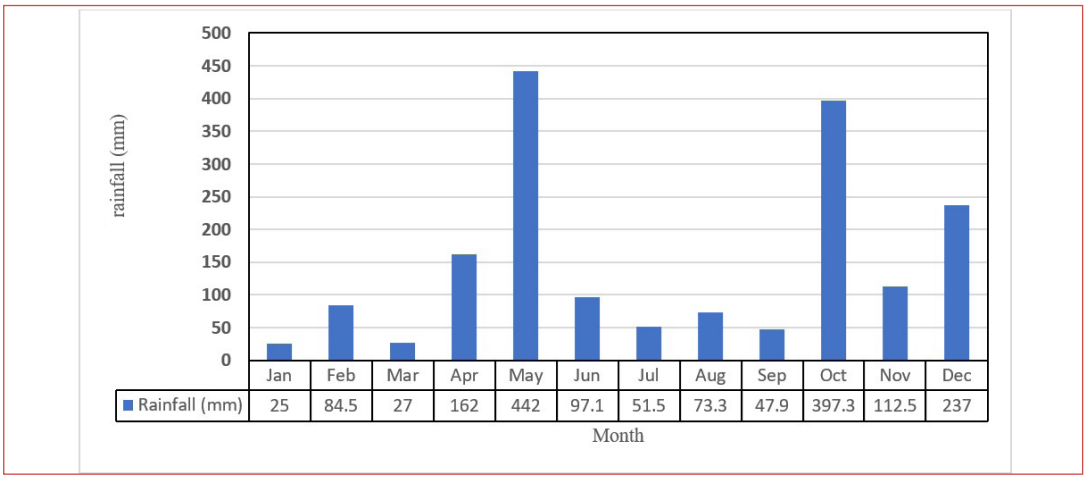


Fig 22. Monthly rainfall (mm) in 2022

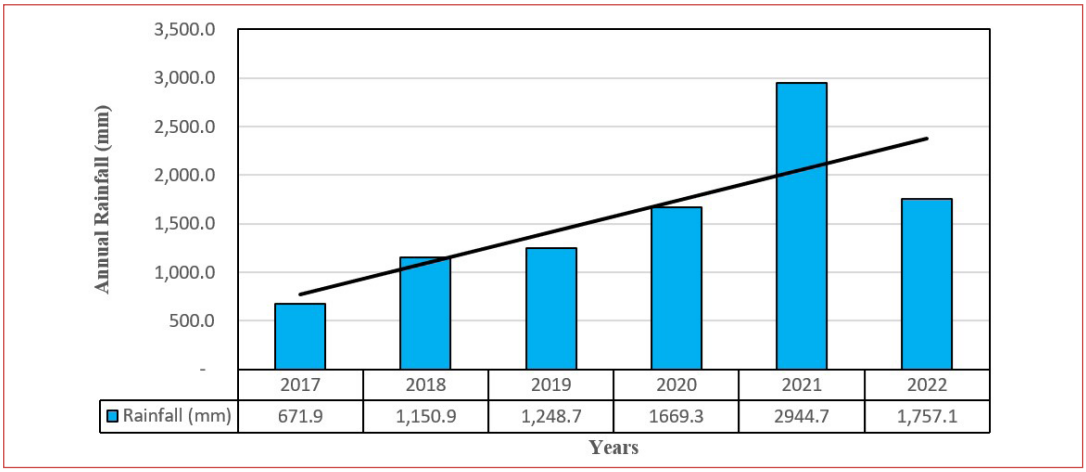


Fig 23. Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	32.13	50.65
2022	33.21	56.37

Bandirippuwa Research Centre

Agro Ecological Zone	IL1a
Extent/ac	360.16

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	-	10,478	333	925	1,078	1,476	1,625	93	310
%	-	64.21	2.04	5.67	6.6	9.04	9.96	0.57	1.9
%	64.21		7.71		6.6		21.47		

Annual Coconut census of the estate

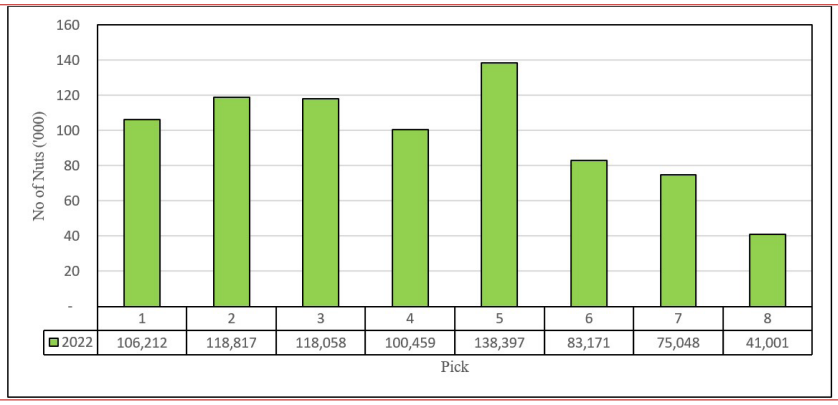


Fig 24. Coconut production in 2022

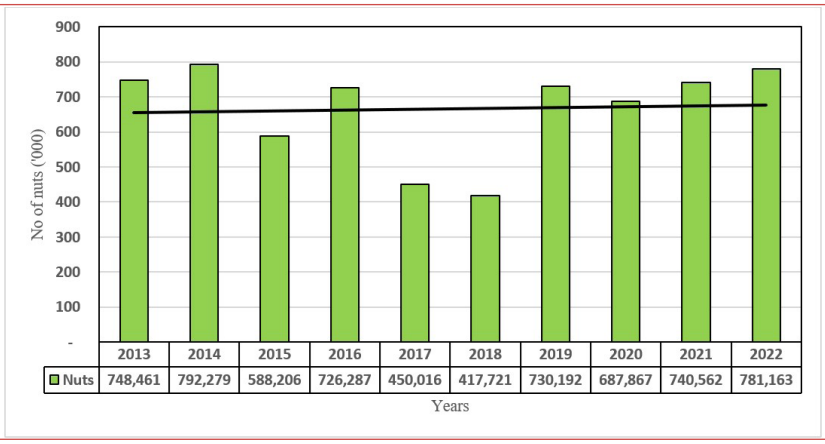


Fig 25. Variation in coconut production in previous years.

The total coconut production during the year was 781,163 nuts, which was about 5.49 % increase compared to that of 2021. This was one of the highest productions observed within past 10-year period. This may have been immensely contributed by the 3018.0 mm rainfall received in 2021 which was the highest rainfall in past 6 years. However, total rainfall received in 2022 was 1563.4 mm which was one of the low rainfall years in the recent

past. Fertilizer application was conducted on 52 % of the total palms of the estate making advantage of both Yala and Maha rains. Weeding, mulching and other cultural practices were duly attended. The road system and fence around the estate was renovated during the year. Livestock consisting of 76 cattle and 46 buffalos were maintained successfully for the production of milk. Technology Park was successfully maintained in field No.07 adjoining Negombo-Kuliyapitiya road. During the year, 1200 husk pits and 650 coconut pits were completed.

Star fruit, Avocado, grafted guava, grafted mango, grafted rambutan, banana, cinnamon, cashew, dragon fruit and turmeric were established in 2022 under the intercropping programme.

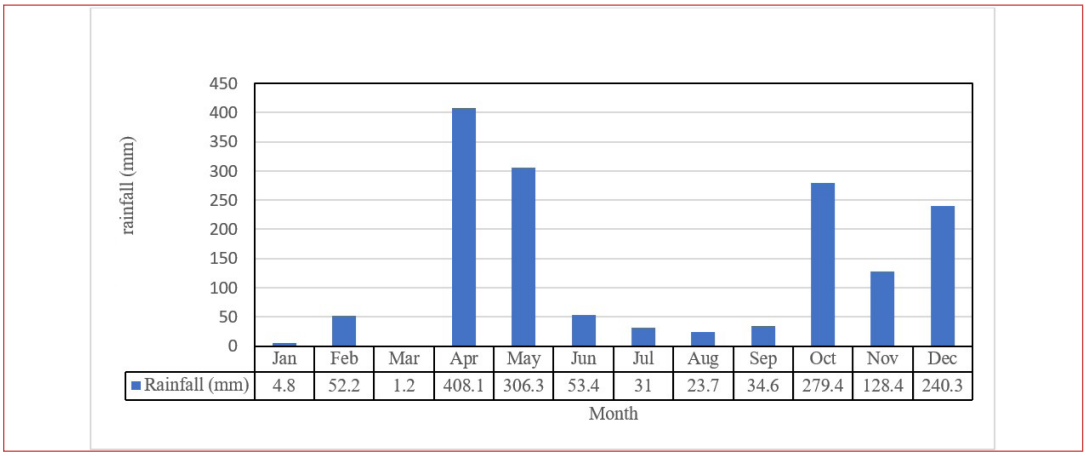


Fig 26. Monthly rainfall (mm) in 2022

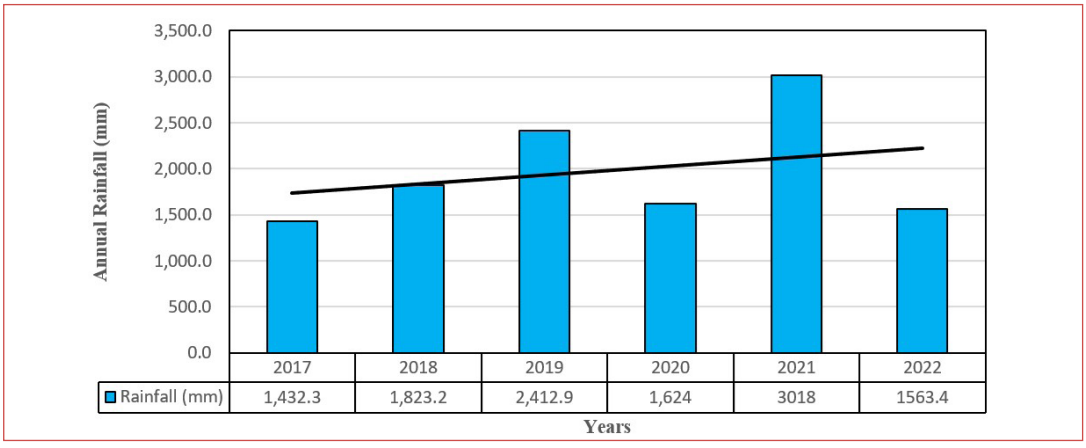


Fig 27. Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	26.96	54.44
2022	31.40	53.56

Rathmalagara Research Centre (RRC)

Agro Ecological Zone	IL1a
Extent/ac	251.1

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	-	7,852	1,649	60	2,245	592	111	-	4,304
%	-	46.7	9.8	0.36	13.35	3.52	1	-	25.6
%	46.7		10.16		13.35		30.12		

Annual Coconut census of the estate

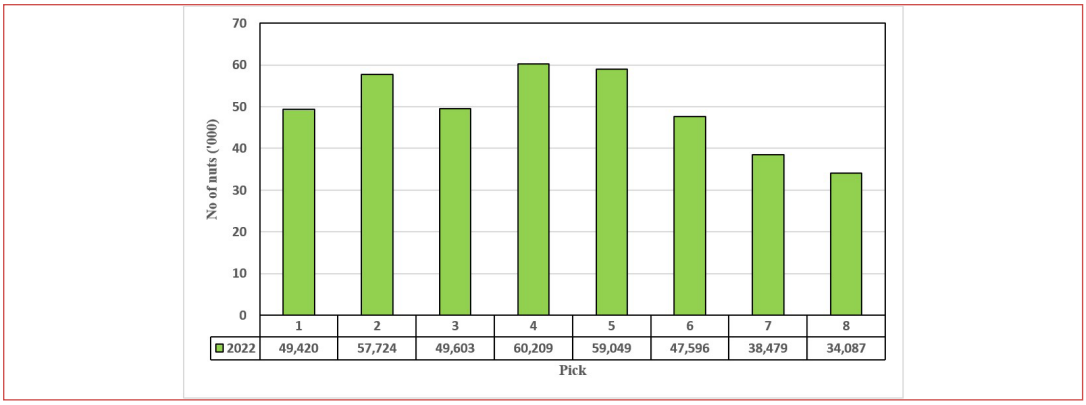


Fig 28. Coconut production in 2022

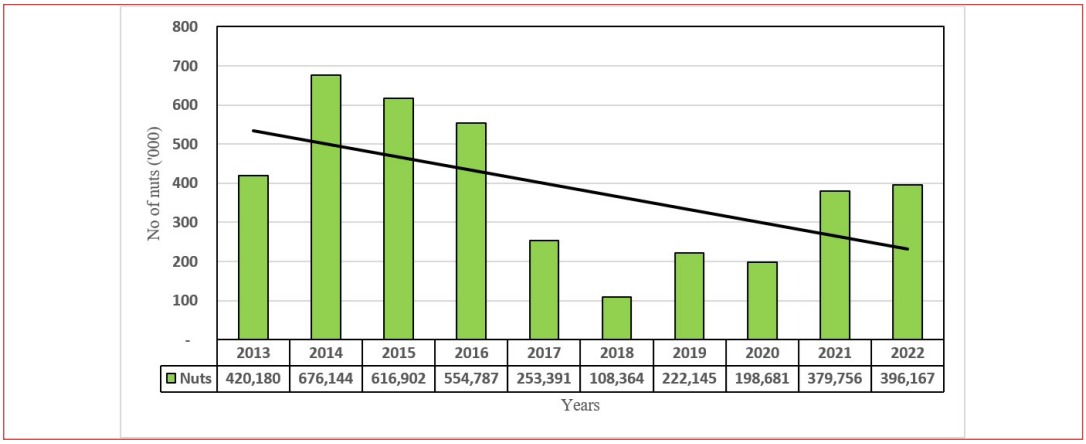


Fig 29. Variation in coconut production in previous years.

With the yield reduction pattern observed from 2014 onwards, conspicuous reductions were observed in 2017 and 2018 of which the lowest production for past ten years was recorded in 2018. This would be the combined effect of the inclement weather; over-aged plantation and the marginally suitable soils exist in the major part of the estate.

Rathmalagara Research Center gave an annual crop of 396,167 nuts in the year 2022, and it was about 1.32 % increase compare to that of 2021. A gradual increasing trend in production was observed from 2019 onwards up to 2022.Rainfall during the year 2022 was 1454.0 mm which was nearly an average rainfall in the area in past few years but it was about 28% reduction in rainfall compared to that of previous year. Livestock consisting of 10 cattle, 17 goats, 39 sheep and 12 hens were maintained successfully. Application of fertilizer were made covering 72.6% of palms. Weeding, mulching and other cultural practices were duly attended. The hose irrigation system for the new planting and under planting was successfully established for the irrigation purposes of the estate. Establishment of 500 husk pits was completed successfully during the year 2022. 11 acers of cinnamon plantation were completed during 2022 year under the intercropping programme of the state.

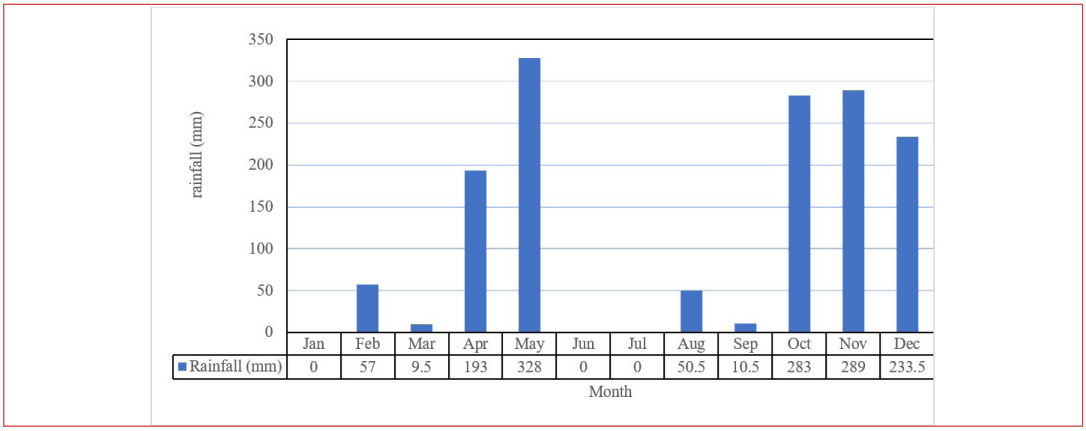


Fig 30. Monthly rainfall (mm) in 2022

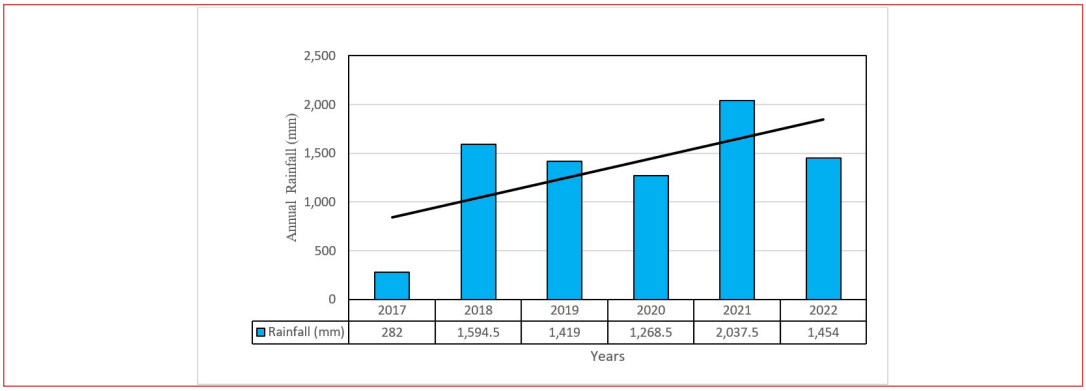


Fig 31. Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	33.17	47.48
2022	34.25	52.95

Poththukulama Research Centre

Agro Ecological Zone	IL1b
Extent/ac	202

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	232	8,317	57	33	31	-	529	362	3,964
%	1.71	61.5	0.43	0.25	0.22	-	3.91	2.67	29.31
%	63.21		0.68		0.22		35.89		

Annual Coconut census of the estate

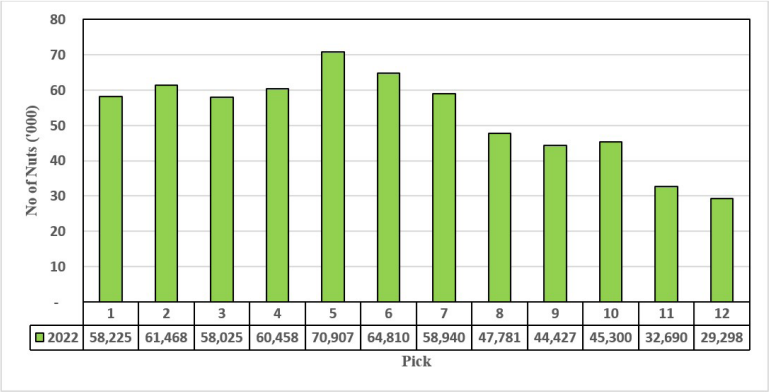


Fig 32. Coconut production in 2022

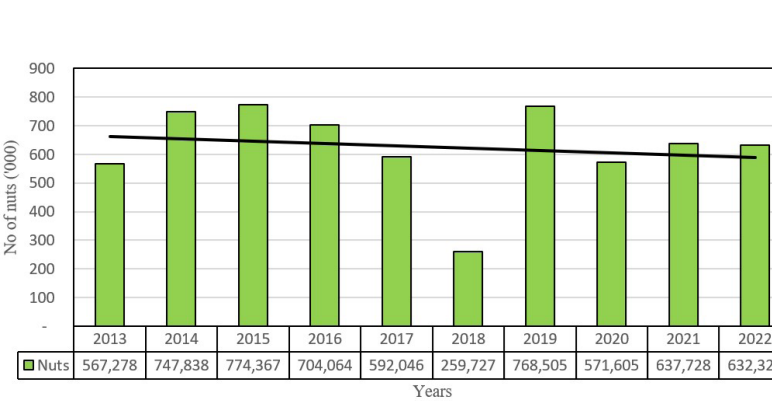


Fig 33. Variation in coconut production in previous years.

The coconut production at Poththukulama Research Center was 632,329 nuts and it was about 0.85 % decrease compared to that of 2021. This estate is used as field experimental sites and a collection of dwarf varieties is maintained in a separate block.

Rainfall during the year was 1048.5 mm which was one of the low rainfall years within last few years.

Routine activities were continued successfully and 25% of total palms of the estate was fertilized during the year. A herd of 63 cattle and 14 buffaloes were maintained during the year. Weeding, mulching and other cultural practices were duly attended. 1700 husk pits and 680 of seedlings were established during the year.

Under the intercropping programme, 2 acres of grafted guava, 1 acre of turmeric and 8 acres of cinnamon plantation were established in 2022 successfully.

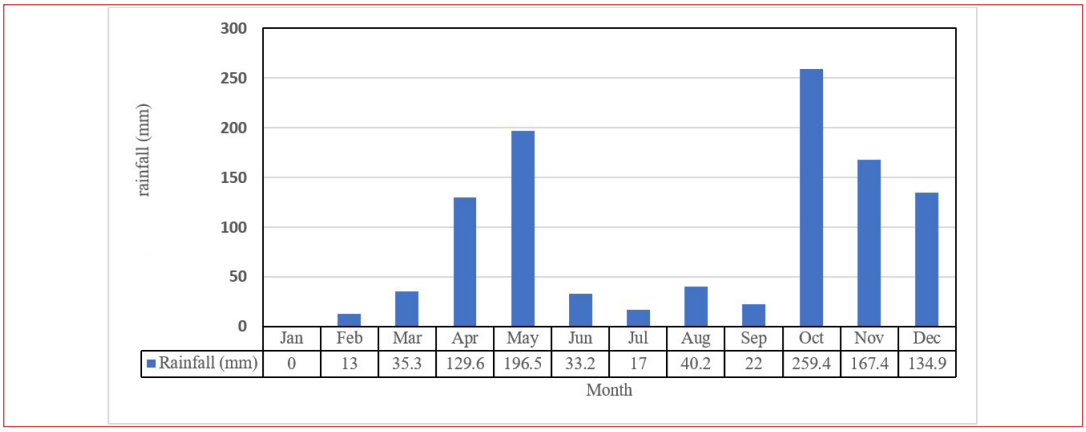


Fig 34. Monthly rainfall (mm) in 2022

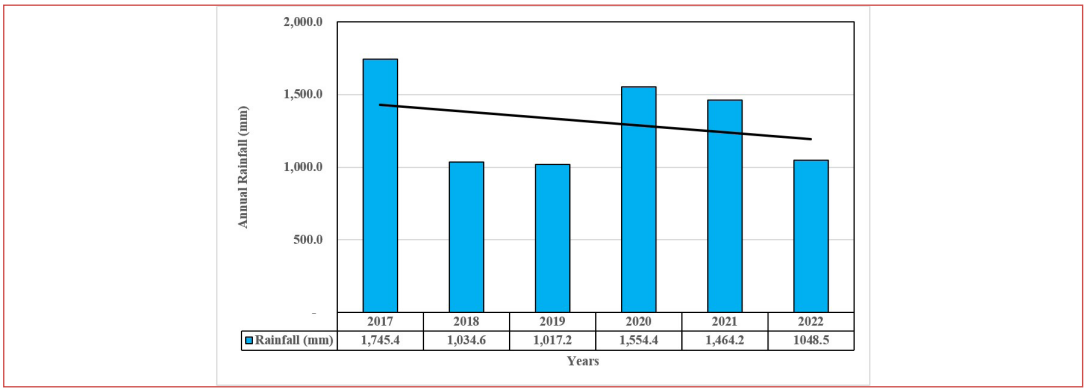


Fig 35. Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	19.27	56.77
2022	19.26	40.72

Walpita Research Centre

Agro Ecological Zone	WL3
Extent/ac	44

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	819	-	540	520	400	165	-	-	-
%	33.51	-	22.09	21.28	16.37	6.75	-	-	-
%	33.51		43.37		16.37		6.75		

Annual Coconut census of the estate

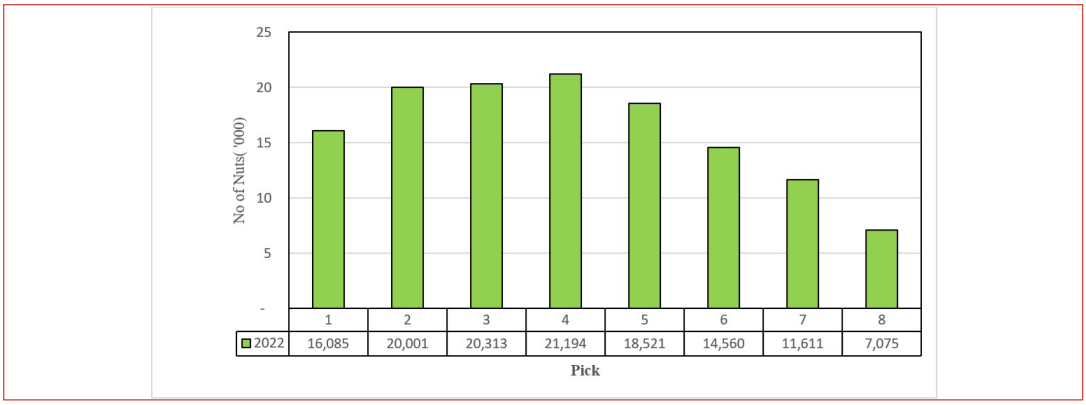


Fig 36. Coconut production in 2022

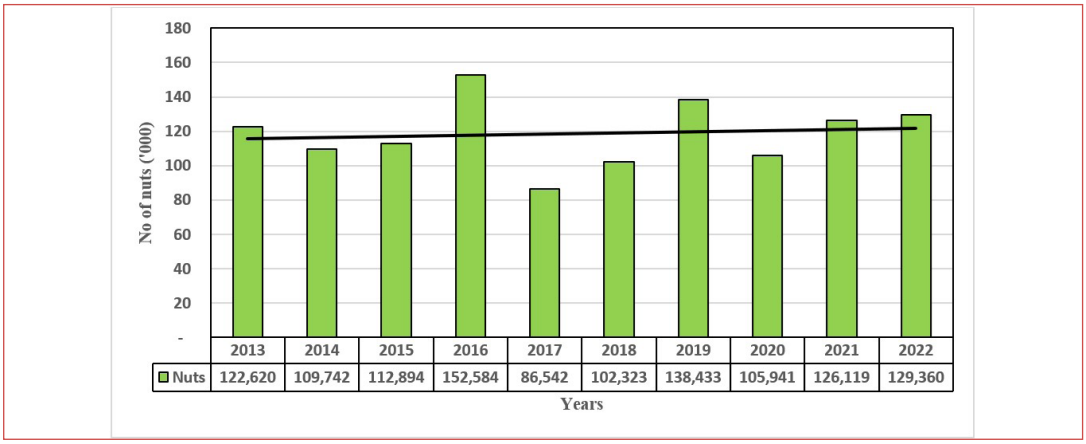


Fig 37. Variation in coconut production in previous years.

This research station was maintained specially for the demonstration purposes of coconut varieties and intercrops. The annual coconut production in 2022 was 129,360 nuts in 2022 and it was about 3 % increase compared to that of 2021. Rainfall during the year was 1648.9

mm. Out of the above nut production 29,928 seed nuts were issued which were separately collected from plus palms. 36.82% palms of the estate were fertilized during the year. Weeding, mulching and other cultural practices were duly attended. About 300 new coconut seedlings were established in 2022.

Under the intercropping programme, casava, turmeric, cinnamon, areca nut and banana were established in 2022.

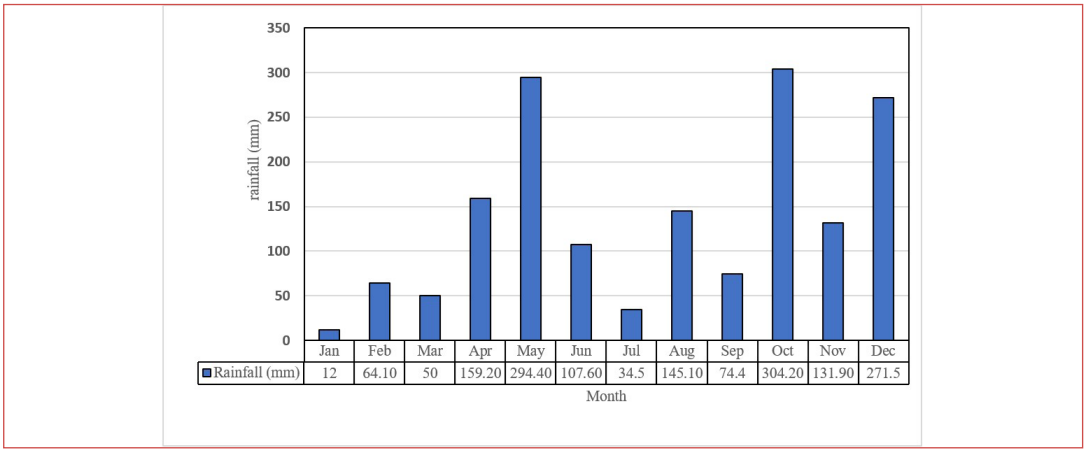


Fig 38. Monthly rainfall (mm) in 2022

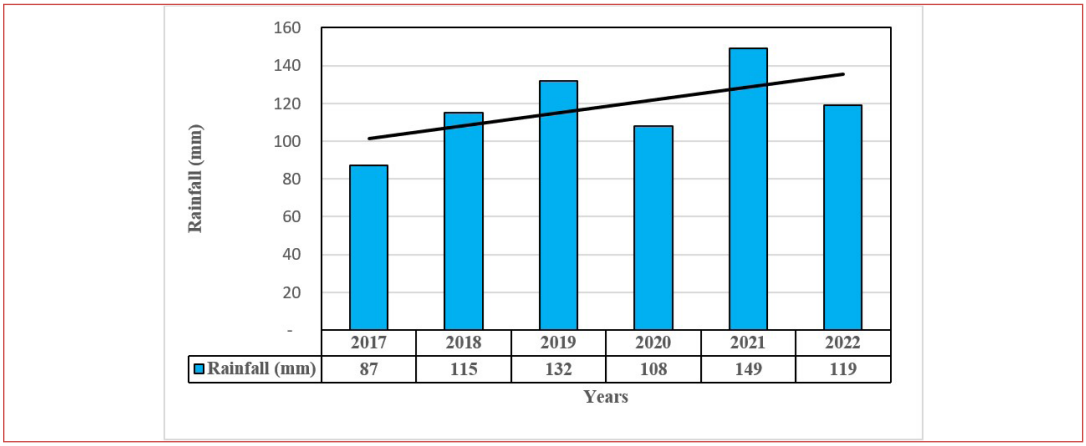


Fig 39. Variation in annual rainfall (mm) in previous year

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	28.15	51.68
2022	35.83	49

Middeniya Research Centre

Agro Ecological Zone	IL1b
Extent/ac	75.55

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	320	2,316	100	39	592	-	-	10	126
%	9.13	66.11	2.85	1.11	16.9	-	-	0.3	3.6
%	75.24		3.96		16.9		3.9		

Annual Coconut census of the estate

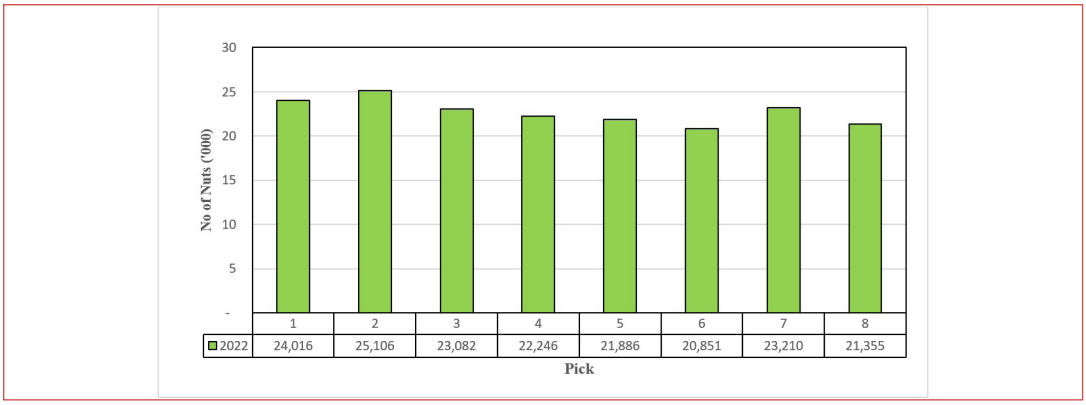


Fig 40. Coconut production in 2022

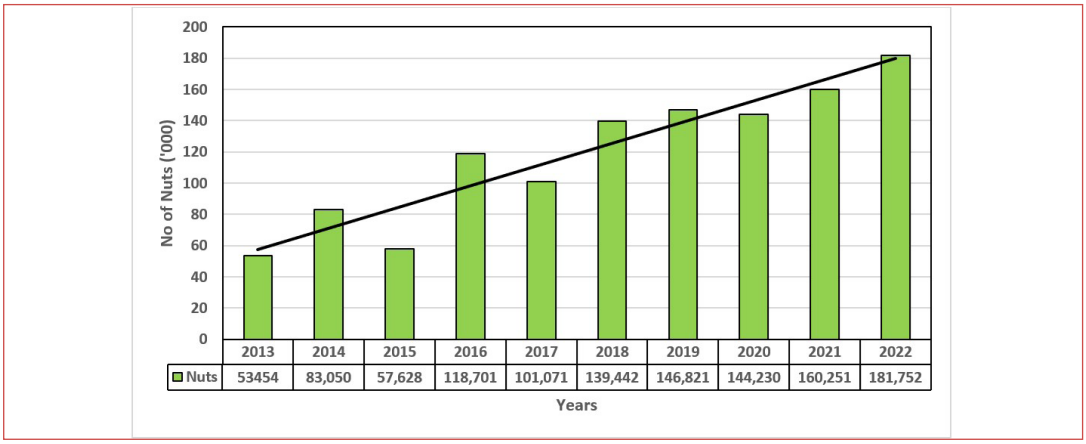


Fig 41. Variation in coconut production in previous years.

The research center is still in the developing stage with the establishment of new varieties. A total Number of 3,503 coconut seedlings of different cultivars have been established in the research centre and about 80% of them have reached the bearing stage.

Middeniya Research Center is important to conduct various demonstrations and extension programs to the public in Southern part of Sri Lanka and disseminate new technologies. The estate gave an annual crop of 181,752 nuts in 2022 and it was about 13.42% increase compared to that of 2021. Rainfall during the year was 694.3 mm and it was the lowest annual rainfall received within last six years.

General maintenance was satisfactorily conducted during the year. Annual application of fertilizer was attended by covering all the palms. Total Number of 310 palms were selected for the new hand pollination programme targeting to produce CRIC65 seed nuts. Turmeric, pepper, papaw, Katu anoda, grafted orange were successfully established in 2022 under the intercropping programme.

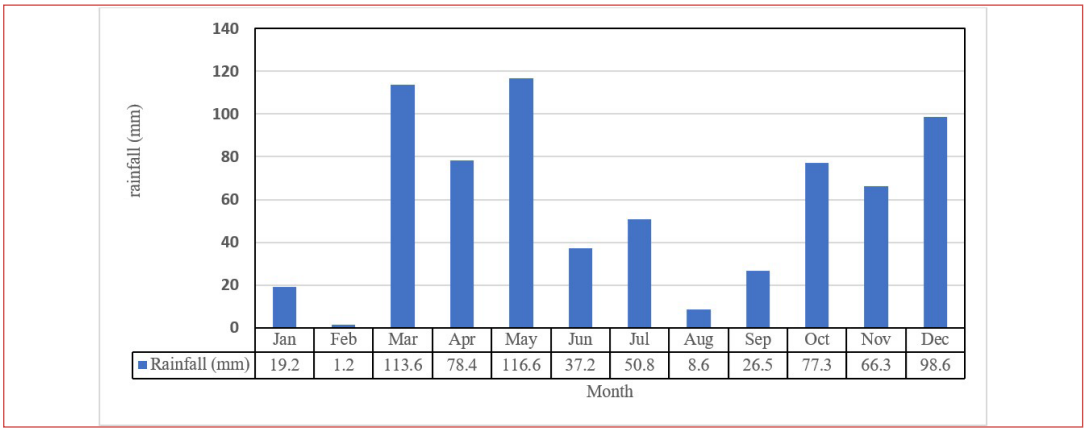


Fig 42. Monthly rainfall (mm) in 2022

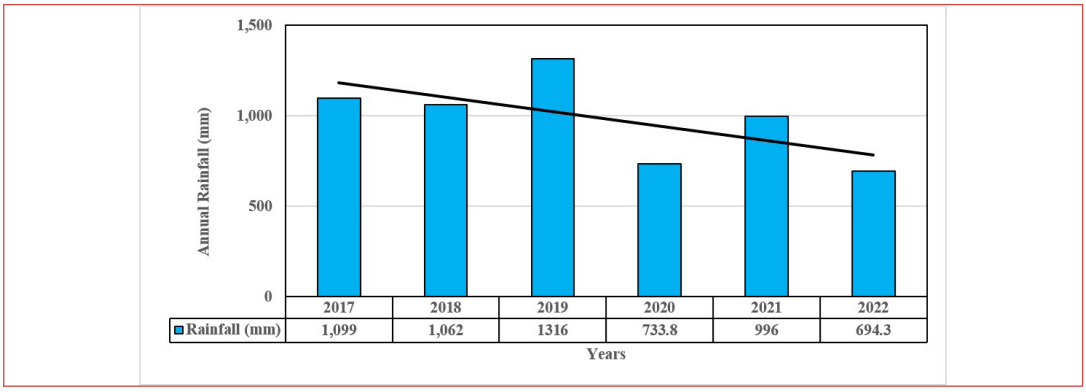


Fig 43. Variation in annual rainfall (mm) in previous years

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	39.33	49.97
2022	40.26	48.26

Thabbowa Research Centre

Agro Ecological Zone	IL1a
Extent/ac	6.90

Description	Well Bearing Palms	Bearing Palms	Partial Bearing Palms	Young Palms	Seedlings	Un productive Senile Palms	Dud Palms	Weak Palms	Vacancies
No. of Palms	149	191	47	4	5	28	5	17	-
%	33.41	42.83	10.54	0.9	1.12	6.28	1.12	3.81	-
%	76.24		11.44		1.12		11.21		

Annual Coconut census of the estate

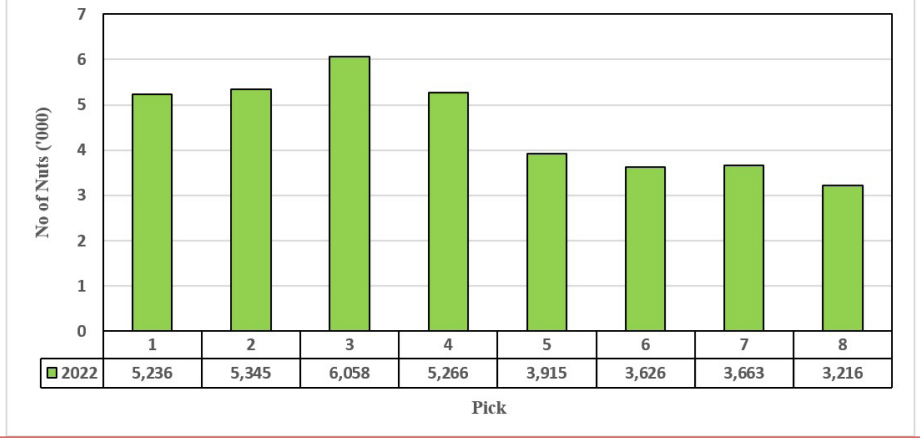


Fig 44. Coconut production in 2022

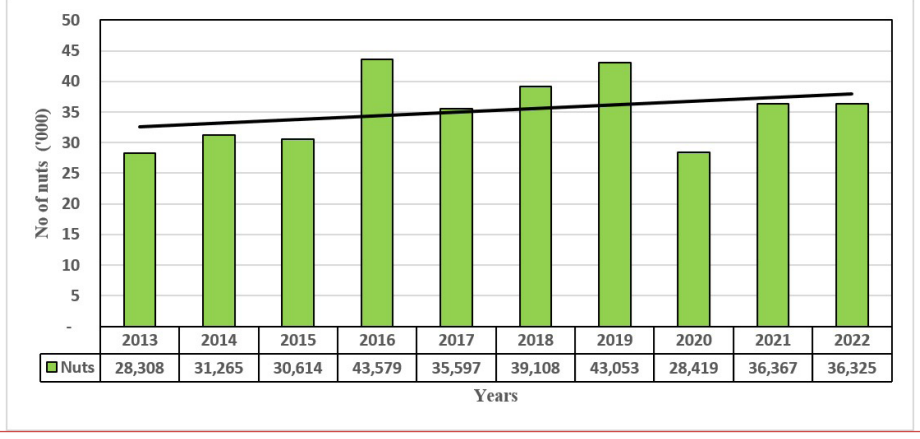


Fig 45. Variation in coconut production in previous years.

This research center was maintained specially for the demonstration purposes of intercrops. Thabbowa Research Center gave an annual crop of 36,325 nuts in the year and it was almost the same production with marginal decrease with respect to that of 2021.

Rainfall during the year was 1,472.3 mm and it was one of the favourable years in the recent past with respect to rainfall. Weeding, mulching and other cultural practices were satisfactorily conducted during the year. Total Number of 74 husk pits were completed during the year.

Banana, areca nut, cinnamon, casava were planted during the year.

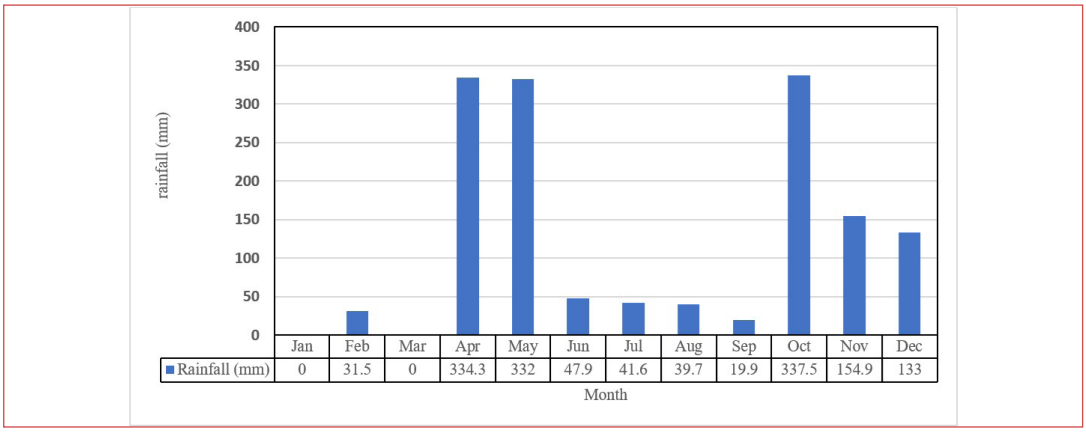


Fig 46. Monthly rainfall (mm) in 2022

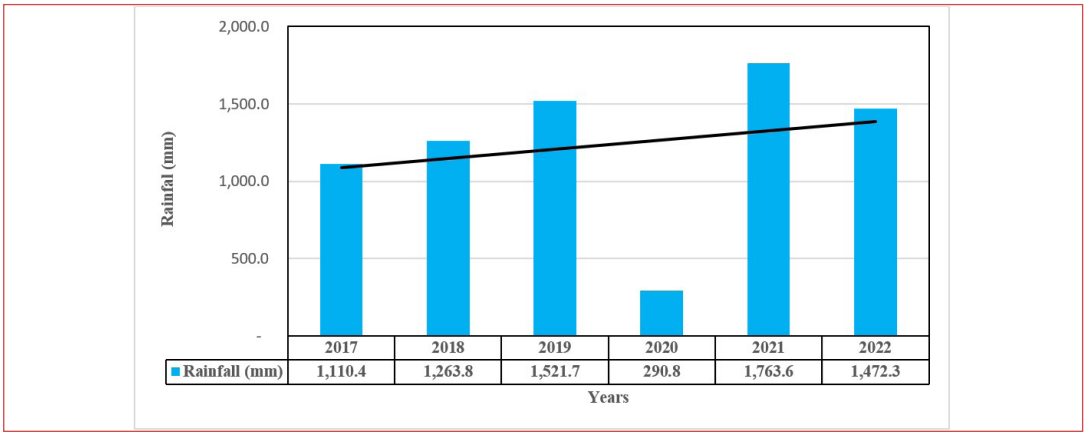


Fig 47. Variation in annual rainfall (mm) in previous years.

	COP / Nut (Rs)	NSA/ Nut (Rs)
2021	28.91	56.22
2022	43.69	49.69

STAFF

Staff Members of the Coconut Research Institute

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Director

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Diputy Director (Research-II)

Mr. I.M.S.K.Edirisinghe, B.Sc (Agric), M.Sc (Peradeniya), Ph.D (Tomas Bata University, Czech Republic)

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Senior Accountant

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- T.D. Nuwarapaksha, B Sc (Agric.)
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Experimental Officers

- J.A.A. Gunasekara, Dip. (Agric)

Technical Officer

- Mrs. K.G.A. Jayamali, B.Sc. Food Science & Nutrition
- Ms K.R.M.P. Gayadari, Dip (Animal Husbandry)
- T.M.N.K. Gunarathne, HNDT (Agric)

Management Assistant

- Mrs. D.T.D. Dhanapala

Lab & Field Assistants

- H.S.G. De Silva
- S.M.R.C. Subasinghe

General Worker

(Office Attendant)

- S.A.K. Sanjeewa

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Ms. H.D.M.A.C. Dissanayake - *Head (Acting)*

B.Sc (Agric), M.Sc, Ph.D (University of Tsukuba, Japan)

Research Officers

- S.W.G.C.R. Kumara, B.Sc (Agric), M.Sc (Environmental Forestry)
- Mrs P.R. Weerasinghe, B.Sc. Botany*
- M.G.O.S. Thilakarathne, B.Sc (Agric. Tech. Mgt)

Seed & Seedling Production & Certification Officer

- L.M.S.R.Jayathilake, B.Sc (Sci), M.Sc (Agric)

Assistant Seed & Seedling Production & Certification Officers

- P.G.R.S. Premathilake, B.Sc (Agric)
- R.I.B.C.T. Herath, B.Sc (Agric), M.Sc (Crop Science)
- M.N. Nadeeranga, B.Sc (Agric)
- R.C.M. Wijayaratne, B.Sc (Agric)
- L.J. Saman, B.Sc (Agric)
- A.S. Jayasundara, B.Sc (Agric)
- D.M.L. Amarasiri, B.Sc (Agric)
- B H N M R Gunasena, B.Sc (Agric)

Experimental Officer

- H.M.N.B. Herath , B.Sc. Plantation Management
- A.A. Fernando, Dip. (Agric)
- S.A.S. Chandrasiri, BIT

Technical Officers

- U.D.C.S. Kumara, HNDT (Agric)
- M.M. Hettiarachchi, Dip. (Food Technology)
- M.A.S.P. Jayasinghe, B.Sc. in Agriculture
- Mrs. B.M.A.U. Amarathunga, Graduate Chemist

Management Assistant

- Ms.S.S.R.Fernando, Dip. (Management)

Lab & Field Assistants

- S.M.T.R. Senaratne
- Ms. W.D.U. Fernando
- U.M.C.C.B. Samarakoon

Senior Lab & Field Attendant

- W. Wimalasiri

Lab & Field Attendant

- G.D.A. Milroy
- J.M.A.S. Kumara
- M.M.T. Kumara
- R.D.A. Leonard

General Woker (Office Attendant)

- Mrs. D.M.R. Chandani

SOILS AND PLANT NUTRITION DIVISION

N.P.A.D. Nainanayaka - *Head (Acting)*

B.Sc (Sci), M.Phil (Peradeniya) Ph.D (University of Essex, UK)

Senior Research Officer

- Ms. D.M.D.P. Dissanayaka , B.Sc (Agric. Tech. Mgt), Ph.D. (Korea University)

Research Officer

- Mrs. G.S. Nirukshan, B.Sc (Agric), M Phil. (Environmental Soil Science)*
- Ms B.H.R. Fernando,B.Sc. Agricultural Technology & Management
- Mrs. A.A.R.W. Abeysinghe, BSc. in Agric. Resource Mgt & Tech.

Experimental Officers

- K.P.A. Pathirana, Dip. (Agric)
- Mrs. H.L.A. Padmini, Dip. (Agric)

Technical Officers

- Mrs R.K.K.H.J. Jayasinghe, Dip. (Agric)
- K.M.P.C. Warnasooriya, HND. (Agric. Production Technology)
- Ms. S.D.Y. Nuwanthika, HND. (Agric. Production Technology)

Management Assistant

- Mrs T.M.D. Abeyratne

Lab & Field Assistants

- M.D.P. Manathunga

Senior Lab & Field Attendant

- E.A. Chandradasa

Lab & Field Attendant

- M.A.G. Pathiraja
- T.A.S.R.P. Thenuwara

CROP PROTECTION DIVISION

P.H.P.R. De Silva - *Head (Cover up duty)*

B.Sc (Agric)

Research Officers

- Mrs. N.I. Suwandaratne, B.Sc (Agric), M.Sc (Zoological Science)*
- Mrs. D.H. Dilrukshi, B.Sc (Agric. Tech. Mgt)
- Ms. D.P.M. Silva, B.Sc.

Experimental Officers

- Ms. P.H.A.P. Siriwardena, B.Sc (Agric)
- S.P. Manoj

Technical Officers

- N.T.M. Wijewardena, HNDT (Agric)
- T.B.K.H. Niranjana, HNDT (Agric)
- Mrs.G.A.N.P. Perera, HNDT (Agric)
- Ms. A.D.T. De Silva Kulasingha, HNDT (Agric)
- Mrs. E.M.N. Madhuwanthi, Dip. (Plantation Management)

Lab & Field Assistants

- C.W.S.P. Yapa
- Mrs. C.A.N. Anthony
- G.A.S. Nuwanpriya
- M.A.D.G. Madurapperuma

Lab & Field Attendant

- R.K.M.S.N. Rajapaksha
- K.M.G.C. Kumarasinghe
- A.M.P. Sanjaya
- Mrs. A.M.J.N. Arthanayaka

General Worker (Office Attendent)

- K.A.M. Indika
- D.K.S. Senarath

TISSUE CULTURE DIVISION

Mrs. V.R.M. Vidanaarachchi - *Head*

B.Sc (Agric), Ph.D (University of Kagoshima, Japan)

Research Officer

- Mrs. S.P.N.C. Jayarathne, B.Sc. in Botany
- Ms. M.T.N. Indrachapa, , B.Sc. in Science

Experimental Officer

- Mrs. T.R. Gunathilake Dip. (Sci)
- Mrs. P.G.K. Perera, B.Sc. in Agriculture

Technical Officer

- Mrs. R.M.S.S. Rathnayake, Dip. (Agric)
- K.A.D.R.C.Kodikara, HNDT (Agric)

Lab & Field Assistant

- Mrs. R.M.K.G.S. Dissanayaka

Lab & Field Attendant

- J.A.S.L. Jayasinghe
- R.S.N. Kumara
- Ms K.P.A. Sanjeewani

COCONUT PROCESSING RESEARCH DIVISION

Mrs. L.L.W.C. Yalegama - *Head*

B.Sc (Chem), M.Sc (India), Ph.D (Peradeniya)

Research Officer

- Mrs. H.P.D.T. Hewapathirana, B.Sc (Agric)
- Mrs. B.G.R.R. Bandara, B.Sc. in Agricultural Resource Management & Technology

Research Officer (Chemical)

- Mrs. J.A.K.M. Fernando, B.Sc (Engineering)

Experimental Officers

- S.S. Rajapaksa, Dip. (Agric)
- Mrs. T.M.S.G. Weerasinghe, Dip. (Agric)

Technical Officers

- Mrs. C.A.T.D. Chandrapeli, HNDT (Agric)
- Mrs. A.M.L. Silva, Dip (Agric)
- D.W.L. Lilruksha, HND. (Agric. Production Technology)

Lab/Field Assistant

- Mrs. S.H.K.G. Kumarasiri
- N.A.C. Udayasiri
- Mrs. D.C.S. Sadamali
- H.D.J.K. Jayasekara

General Worker (Office Attendant)

- A.A.C. Dhammika

PLANT PHYSIOLOGY DIVISION

N.P.A.D. Nainanayaka - *Head*

B.Sc (Sci), M.Phil (Peradeniya), Ph.D (University of Essex, UK)

Principal Research Officer

- Mrs. K.P. Waidyaratne, B.Sc (Agric), Ph.D (Lincoin University, New Zealand)

Research Officer

- Mrs. T.H. Chandarathilaka, B.Sc (Sci)

Experimental Officers

- W.A.S. Wickramarachchi
- A.P.C. Pradeep, Dip. (Agric)

Technical Officers

- Mrs. G.A.M. Samanthi, Dip. (Agric)

Senior Lab & Field Attendant

- J.H.U. Jayamaha

Lab & Field Attendant

- H.A.C.P. Hettiarachchi
- H.M.S. Nayanakumara
- Mrs. T.S. Abeyratne

AGRICULTURAL ECONOMICS AND AGRIBUSINESS MANAGEMENT DIVISION

Mrs. K.V.N.N. Jayalath - *Cover up Duties*

B.Sc (Agric), Mphil(Queensland, Australia)

Research Officer

- Ms. P.M.M. Fernando, BSc. in Export Agri.

Technical Officer

- M.A.N.A. Kumara, Dip. (Plantation Mgt.)
- Ms. A.M.T.B.Amarasekara, HNDT (Agric)

Lab & Field Assistant

- Ms.W.A.S. Fernando
- Ms S.M.A. Chiranthi

TECHNOLOGY TRANSFER DIVISION

C.S. Herath - *Head*

B.Sc (Agric), M.Sc (Peradeniya), Ph.D (Tomas Bata University, Czech Republic)

Technology Transfer Officers

- Mrs. H.D.N.H. Fonseka, B.Sc (Agric), M.Sc (Peradeniya)
- Mrs. W.G.R. Subhathma, B.Sc (Agric), M.Sc (Ruhuna)

Assistant Extension Officer

- E.M.T. Bandaranayake, B.Sc (Agric), M.Sc (Agric) (Peradeniya)

Experimental Officer

- Mrs. C.P.A. Kurundukumbura, B.Sc (Agric)

Experimental Officer(Tamil Medium)

- P. Majuran, B.Sc. in Science & Tech.

Technical Officer

- M.D.M. Perera, Dip. (Plantation Management)

Senior Lab & Field Attendant

- N.A.W. Jayasiri

Lab & Field Attendant

- Mrs. W.S.S. Fernando
- J.A.S. Niroshan

Book Binder

- I.H.D. Senarath

Senior General Woker (Office Attendant)

- K.A.S.C.N. Fernando

General Worker(Office Attendant)

- S.A.A. Viraj
- D.M.T. Sampath

Central Analytical Laborotory

Ms. M.K.F. Nadeesha - *Head (Cover up Duties)*

B.Sc (Chemistry), M.Sc (Food Technology)

Experimental Officers

- K.P.I.E. Ambagala, Dip. (Agric)
- B.S.V.J. Perera, Dip. (Agric)
- P.P.G. Fernando (Gratuate Chemist)

Technical Officers

- W.M.Nuwan, HNDT(Agric)
- K.D.C. Premarathne, HND (Agric, Production Tec)
- D.C.D. Perera, HND (Agric)
- J.A.D. Madusanka, HNDT(Agric)
- M.I. Senarathne, Dip(Agric)

Lab & Field Attendant

- W.R.P. Tissera
- M.L.P.D. Liyanage

LIBRARY

Management Assistant

- Mrs. J.A.D.R.U. Jayasinghe

General Worker(Office Attendant)

- Mrs H.A.T. Thilakumari

ESTABLISHMENT UNIT

C.P.D. Fernando - *Assistant Director (Administration)*

B.Sc. (Business Administration)

Procurement Officer

- M.C.H.N. Fernando PGDHRM(Col), BLE(Col), AMISMM

Personal Assistant to the Chairman

- Mrs.H.M.A. Herath

Administrative Officer

- Mrs. K.P.S. Jayathilake, Dip. (HRM)

Human Resource Officer

- Mrs. W.S.R. Fernando, Dip. (HRM)

Technical Officers (Civil)

- Mr. R.M.R.G. Nawarathne, Dip. (Engineering Sciences)

Field Officer

- G.A.K. Sanjeewa HND (Agri. Produc. Tech.)

Management Assistants

- W.M.S. Lowe
- P.C.P.K. Fernando, B. Com
- P.D. Kathriarachchi
- Mrs. W.A.H. Shenali, AAT
- Mrs. M.A.N. Dilrukshi, BA (Special)
- Mrs U.A.D.N.K. Chathurani, HND (IT)
- Mrs P.D. Wickramanayake
- Mrs. W.M.S.M. Rathnayake

Receptionist/Telephone Operator

- Ms. A P Nallaperuma

Lab & Field Assistant

- W.M.M. Gihan

Lab & Field Attendant

- Mrs. R.A.P. Jayamanna

Guest House Keeper

- K.K.A. Mendis

Drivers

- K.P.S. Dissanayaka
- I.P.K.P. Perera
- P.G.P.S. Karunarathna
- H.M. Jayathunga
- E.G.N. Bandara
- E.G.A.P. Jinadasa
- T.P.J. Chamendra
- C.S. Basnayaka
- W.M. J. Banda
- H.C.P. Thirimanna
- M.A.R. Rupasinghe
- B.M.W.G.S.N. Abeysingha
- H.D.S. Dammika
- S.M. Chaminda
- L. Thirugnamoorthy
- M.A.T.R. Marasinghe

General Worker (Office Attendant)

- J.K.J. Perera
- D.W.K. Madushanka
- M.P.S. Fernando
- Mrs. H.D. Suseetha
- Mrs. R.D. Shiroma
- W.A.T. Arunasiri
- G.V.N.W. Kumara

Vehicle Attendant

- D.W. Nevil
- T.M.A.P. Kumarasinghe
- S.H.A.M. Premarathna

Building Helper

- K.J.J.Appuhami
- R.G.S.J. Manchanayake

INTERNAL AUDIT UNIT

P.W.A. Fernando - *Internal Auditor*

B.B. Mgt. (Accounting). MBA. (Wayamba University)

Senior Management Assistant

- Mrs. S.N. Gunathilake

Management Assistant

- G.P.K. Madhusanka

Management Assistant (Audit)

- Mr.H.S.S.S. De Seram (AAT)

General Worker (Office Attendant)

- M.A.G. Ananda

ACCOUNTS UNIT

Mrs. B.A.D.C.S. Bulathsinhala - *Accountant*

B. Com, University of Kelaniya

Management Assistants (Book Keeping)

- A.H.M.J.S. Abeyrathne, HNDBS
- Mrs. W.D.P. Fernando, AAT, B.Sc (Accountancy & Business Finance)
- H.P.S.V. Herath
- Ms R.M.R.D. Rathnayake, B.Sc. (Business Management)
- Mrs. R.D.S. Priyadarshani, AAT

Senior Management Assistant (Accounting)

- Mrs. A.S.M.S. Abeywickrama

Management Assistant (Accounting)

- Mrs. W.A.N.K. Wijesinghe

Management Assistant (Store-Keeping)

- S.M.R.B. Subasinghe, AAT

Management Assistant

- J.A.S. Indika

General Worker (Office Attendant)

- P.K.C. Sampath
- K.A.A. Kumara
- K.M.V.C.P. Kumarasinghe

ENGINEERING UNIT

A.L.D.K. Amarasinghe - *Resident Engineer*

Dip. (Eng. Science), NDES (Civil)

Works Superintendent

- P.H.D.T.M.S. Wimalarathne, Advance Dip. (Construction Technology)

Technological Officer (Mechanical)

- H.A.K.Bandara, Training Course in Automobile Mechanics

Technological Officer (Electrical)

- M.M. Rasith, HND in Engeenering (Electrical-Power)

Management Assistant

- Ms. H.M. Mallikarachchi

Motor Mechanic

- Y.P.N.D. Wijesinghe

Tinker

- C.M.S.F. Leslipulle

Electrical Helper

- H.M.N. Jayarathna

Plumber

- B.R.D. Silva

Linesman

- M.M.D.C. Munasinghe

Lab & Field Attendant

- B.M.L. Dharmasiri

General Worker (Office Attendent)

- E.M.U. Nishantha
- J.A.R. Malintha

ESTATE MANAGEMENT DIVISION

L.S.B. Liyanage - *Manager (Estates)*

B.Sc. (Agric)

Assistant Estate Superintendent

- Mrs. D.K.A. Heshani, B.Sc. (Agric)

Senior Management Assistants

- Mrs. M.G. Karunawathie

Management Assistants (Accounting)

- Mrs H.A.N. Subhashini

BANDIRIPPUWA RESEARCH CENTER

Estate Superintendent

W.A.H. Upali, Dip. (Plantation Management)

Management Assistant

- Ms. R.P.W. Sanderenu

Field Officer

- K.P.D.P. Kotuwegedara, HND (Agri. Produc.)

Field Supervisor

- P.D.R.S. Appuhamy.

General Woker (Office Attendant)

- W.A.S. Jayathilake

General Woker (Watcher)

- S.M.U.D. Singhabahu

RATMALAGARA RESEARCH CENTRE

Esate Superintendent

B.U.C. Samarakoon, B.Sc. (Agric)

Field Supervisor

- W.M.D.R. Wijesinghe
- H.R.I.U. Gunawardana

Lab and Field Attendant

- J.M.C.P Jayamanna

AMBAKELLE GENETICS RESOURCES CENTRE

Estate Superintendent

D.R.S. Wijegunathilake, B.Sc. in Palm & Latex Technology & Value Addition

Field Officer

- B.G.I.N. Bandara, HND (Agri. Produc. Tech.)

Field Superviosr

- K.A.G.P. Rathnaweera

Lab & Field Attendant

- H.M.G. Jayawardena

Driver

- W.D.C.S. Thushara

General Woker (Watcher)

- D.M.L. Jayarathna

MADURUOYA GENETICS RESOURCE CENTRE

Estate Superintendent

I.P.S.A. Wanasinghe, B.Sc (Agric)

Field Supervisor

- W.W.M.S.N. Wasalage

General Woker (Office Attendant)

- Mrs. W.G. Mallika Manike

MIDDENIYA RESEARCH CENTRE

Officer-in-Charge

E.A.S. Kumara, Diploma in Plantation Management

Field Supervisor

- K.G. Wasantha

Driver

- A.K. Pemadasa

WELIGAMA RESEARCH CENTRE

Officer-in-Charge

S.A.S. Kumara

POTHTHUKULAMA RESEARCH CENTRE

Assistant Estate Superintendent

R.P.G.C.S. Kumara, B.Sc (Agric)

Management Assistant

- R.M.N.K. Ratnayaka

Lab & Field Attendant

- H.J.M.P. Nilanga

MAKANDURA GENETICS RESOURCE CENTRE

Officer in Charge

W.M.N.G. Wijayatunga, Diploma Course in Agriculture

General Woker (Office Attendant)

- Mrs. P.M. Kamalawathie

PALLAMA GENETICS RESOURCE CENTRE

Officer-in-Charge

J.A.S.C. Jayakodi, B.Sc (Agric)

Field Officer

- E.G.P.S. Somarathne, HND (Agri. Produc. Tech.)
- W.A.A.N.J. Wickremasinghe, HND (Agric.)

Field Supervisor

M.A.S. Ayeshan

S.M.J.P. Senarathne

Driver

- H.M.D.N. Herath

WALPITA RESEARCH CENTRE

Officer-in-Charge

T.M.N. Menaka, Dip (Plantation Management)

THABBOWA DEMOSTRATION FARM

Officer-in-Charge

C.S. Wellappili, B.Sc (Agric)

* Study Leave

** No pay Leave

Recruitments, Retirements, Resignations, Promotions & Transfers

REPORT OF THE ADMINISTRATION DIVISION

1. ESTABLISHMENT UNIT

The unit continued to assist research divisions in routine administrative matters and related affairs.

2. CADRE

The staff position of the Coconut Research Institute at the end of December 2021, is given in Table 1.

Table 01.

Salary Code	Appr.	Exis.	Vacancies
HM 2-3	01	01	00
HM 2-1	01	01	00
HM 1-3	19	09	10
HM 1-1	01	00	01
MM 1-2	07	05	02
AR 2	14	05	09
AR 1	26	23	03
JM 1-2	15	11	04
MA 4	28	27	01
MA 3	05	04	01
MA 2-2	59	44	15
MA 1-2	85	51	34
PL 3	39	23	16
PL 2	53	31	22
PL 1	38	33	05
	391	268	123

3. WELFARE

Welfare facilities provided to the employees from the Board were continued. Financial assistance provided to the employees is given below:

3.1. Financial Aid

Distress Loans: Granted for 77 employees, amounting to Rs. 19,040,600/-

Transport Loans: Granted for 12 employees, amounting to Rs. 600,000/-

STAFF MATTERS

4. APPOINTMENTS

Following appointments were made during the year 2022, and the details are given in Table 2.

Table 02. Appointments made during the year 2022

Name	Designation	Division / Unit	Date
Mr. W. A. A. N. J. Wickramasinghe	Field Officer	Estate Management Division (PGRC)	03.01.2022
Mr. T. V. Jayewardhane	Field Officer	Estate Management Division (BRC)	03.01.2022
Mrs.B.G.R.R. Bandara	Research Officer	Coconut Processing Research Division	03.01.2022
Miss. D. M. N.S. Dissanayake	Research Officer	Agronomy Division	03.01.2022
Mr. M. S. M. Rashith	Technological Officer (Electrical)	Engineering Unit	24.01.2022
Mr. K. G. D. P. Kotuwegedara	Field Officer	Estate Management Division (BRC)	10.02.2022
Dr. (Mr.) I. M. S. K. Idirisinghe	Deputy Director (Research- II)	Establishment Unit	25.08.2022
Dr. (Miss.) D. M. P. D. Dissanayaka	Senior Research Officer	Soil and Plant Nutrition Division	25.08.2022

5. RESIGNATIONS, RETIREMENTS, VACATION OF POSTS & TERMINATIONS OF SERVICES & DEATHS

The details are given in Table 3.

Table 3. **Retirements:**

Name	Designation	Division/Unit	Date
Mr. I. A. N. Hemasiri	Estate Superintendent	Estate Management Division	16.07.2022
Mr. R. K. S. Wimalsiri	General Worker (Office Attendant)	Accounts Division	31.12.2022
Mr. R. M. N. Sandasiri	Lab & Field Attendant	Soil and Plant Nutrition Division	31.12.2022
Mrs. S. A. Sumanawathi	Lab & Field Attendant	Estate Management Division (PGRC)	31.12.2022

Resignations:

Name	Designation	Division/Unit	Date
Mr. G. L. U. S. Gunawardhana	Technological Officer (Electrical)	Engineering Unit	18.01.2022
Mr. T. V. Jayawardhana	Field Officer	Estate Management Division (BRC)	26.01.2022
Mrs. M. M. L. Silva	Management Assistant	Internal Audit Unit	31.05.2022
Mr. P. Krishanth	Assistant Seed and Seedling Production Certification Officer	Genetics and Plant Breeding Division	14.09.2022
Mr. P. D. R. S. Appuhamy	Field Supervisor	Estate Management Division (BRC)	23.09.2022
Mrs. K. A. T. Kumari	Technical Officer	Agronomy Division	19.09.2022

Deaths:

Name	Designation	Division/Unit	Date
Mrs. P. D. U. C. Dharmapala	Librarian	Library	25.03.2022
Dr. K. M. R. T. Wijekoon	Technology Transfer Officer	Technology Transfer Division	12.05.2022

Vacation of posts:

Name	Designation	Division/Unit	Date
Dr. (Mr). M. P. D. Kumarathunga	Senior Research Officer	Plant Physiology Division	01.03.2022

6. PROMOTIONS

6.1 PROMOTIONS IN EXECUTIVE GRADES

Name	Designation	From Grade/ To Grade	Date
Mr. L. M. S. R. Jayathilaka	Seed and Seedling Production Certification Officer	II to I	22.08.2018
Mr. M. C. H. N. Fernando	Procurement Officer	II to I	29.08.2021
Mr. P. W. A. Fernando	Internal Auditor	II to I	01.07.2021

6.2 PROMOTIONS IN NON-EXECUTIVE GRADES

Name	Designation	From Grade/ To Grade	Date
Mrs. W. A. N. K. Wijesinghe	Management Assistant (Accounting)	II to I	01.01.2021

7. TRANSFERS

Name & Designation	Place of Transfer (From/To)	Effective Date
Mr. D. K. S. Senarathne – General Worker (Office Attendant)	Establishment Division – Crop Protection Division	03.01.2022
Mr. K. P. I. E. Ambagala – Experimental Officer	Soil Plant Nutrition Division – Central Analytical Laboratory	07.03.2022
Mr. B. S. V. J. Perera – Experimental Officer	Soil Plant Nutrition Division – Central Analytical Laboratory	07.03.2022
Mr. P. G. P. Fernando – Experimental Officer	Agronomy Division – Central Analytical Laboratory	07.03.2022
Mr. J. A. D. Madusanka – Technical Officer	Coconut Processing Research Division – Central Analytical Laboratory	07.03.2022
Mr. W. M. Nuwan - Technical Officer	Agronomy Division – Central Analytical Laboratory	07.03.2022
Miss. K. D. C. Premarathne – Technical Officer	Soil Plant Nutrition Division – Central Analytical Laboratory	07.03.2022
Mr. D. C. D. Perera – Technical Officer	Soil Plant Nutrition Division – Central Analytical Laboratory	07.03.2022
Mr. L. M. G. D. Liyanage – Lab & Field Attendant	Soil Plant Nutrition Division – Central Analytical Laboratory	07.03.2022
Mr. W. R. P. Tissera – Lab & Field Attendant	Soil Plant Nutrition Division – Central Analytical Laboratory	07.03.2022
Mrs. L. M. I. Senarathne – Technical Officer	Coconut Processing Research Division – Central Analytical Laboratory	07.03.2022 – 06.09.2022
Mr. M. A. S. Ayshan – Field Supervisor	Pallama Genetic Research Centre – Bandirippuwa Research Centre	01.09.2022
Mrs. C. A. T. D. Chandrapeli – Technical Officer	Coconut Processing Research Division – Central Analytical Laboratory	08.09.2022 - 07.03.2023

8. LOCAL TRAININGS (More than 7 days)

Name	Designation	Name of the Course	Institute	Duration
Mr. S. M. R. C Subasinghe	Lab & Field Assistant	Advance Diploma in Advertising (Online)	NIBM	01 Year
Mr. W. M. S. Lowe	Management Assistant	Diploma in Human Recourse Management (Online)	NILS	01 Year
Mrs. H. P. D. T. Hewa Pathirana	Research Officer	Agriculture Biotechnology Application (Online)	People's Republic of China	01 Month
Mrs. B. G. R. R Bandara	Research Officer	Cotton Processing textile and trade for developing countries (Online)	People's Republic of China	21 Days
Mrs. J. A. K. M. Fernando	Research Officer (Chemical Engineering)	Cotton Processing textile and trade for developing countries (Online)	People's Republic of China	21 Days
Mr. S. S. Rajapakse	Experimental Officer	Enhancement of ecological agriculture value chains for developing countries (Online)	People's Republic of China	10 Days
Mrs.T. M. S. G. Weerasinghe	Experimental Officer	Emerging technologies in postharvest handling &logistics of fruits and vegetables (Online)	People's Republic of China	21 Days
Mr. J. A. D. Madhusanka	Technical Officer	Import & export food inspection and food safety for officials of developing countries (Online)	People's Republic of China	21 Days
Mr. D. W. l. Lilrukshan	Technical Officer	Emerging technologies in postharvest handling &logistics of fruits and vegetables (Online)	People's Republic of China	21 Days
Mrs. A. M. L. Silva	Technical Officer	Import & export food inspection and food safety for officials of developing countries (Online)	People's Republic of China	21 Days

Mrs. M. I. Senarathne	Technical Officer	Import & export food inspection and food safety for officials of developing countries (Online)	People's Republic of China	21 Days
Miss. P. M. M. Fernando	Research Officer	Enhancement of ecological agriculture value chains for developing countries (Online)	People's Republic of China	10 Days
Miss. A. M. T. B. Amarasekara	Technical Officer	Enhancement of ecological agriculture value chains for developing countries (Online)	People's Republic of China	10 Days
Mr. W. M. M. Gihan	Lab & Field Assistant	Tunnel engineering and technology for developing countries (Online)	People's Republic of China	21 Days

9. OVERSEAS VISITS

1. Dr. A.A.F.L.K. Perera, Additional Director participated at the appraisal of the Indonesia International Coconut Gene Bank in Manado, North Sulawesi, Indonesia from 22.02.2022 to 05.03.2022.

2. Dr. V.R.M. Vidhanaarachchi, Head of the Tissue Culture Division as a resource speaker & Mrs. P.G.K. Perera, Experimental Officer & Ms. M.T.N. Indrachapa, Research Officer of the Tissue Culture Division as trainees attended to a tissue culture workshop-cum training on "Collaborative Initiatives towards Enhancing Tissue Culture R & D" hosted by the ICAR-Central Plantation Crop Research Institute (CPCRI), India from 15.05.2022 to 21.05.2022.

3. Dr. A.A.F.L.K. Perera, Additional Director participated at the appraisal team for conducting the OCG-SAME(South Asia & Middle East) hosted by the ICAR-Central Plantation Crop Research Institute (CPCRI),India from 19.05.2022 to 24.05.2022.

4. Dr. A.A.F.L.K. Perera/ Additional Director & Dr. V.R.M. Vidhanaarachchi, Head of the Tissue Culture Division participated as resource persons to the 50th International COCOTECH Conference & Exhibition in Kuala Lumpur, Malaysia from 06.11.2022 to 12.11.2022.

10. OVERSEAS TRAININGS

Overseas trainings were not offered during the year 2022.

11. TRANSPORT ACIVITIES

Vehicles of the Coconut Research Institute as at 31.12.2022.

Buses	-	03
Lorries	-	02
Vans	-	05
Cars	-	02
Cabs	-	16
Jeeps	-	01
Motor bicycles	-	65
Three Wheelers	-	03
Tractors	-	28
Tractor Trailer/ Bowser	-	38
Hand Tractors	-	08
		176

12. DEBTORS DUE TO VIOLATION OF BONDS

Name	Designation	Bond Value
Dr. H. P. S. Jayasundara	Research Officer	Rs. 2,078,905.33
Dr. M. G. F. S. Jayasundara	Research Officer	Rs. 3,345,424.66
Mr. N. A. K. De Silva	Research Officer	Rs. 3,204,297.60
Dr. J. M. M. A. Jayasundera	Senior Research Officer	Rs. 847,880.00
Mr. B. H. C. Mendis	Research Officer	Rs. 1,014,780.00
Dr. S. C. Somasiri	Senior Research Officer	Rs.11,907,933.05
Dr. H. M. I. K. Herath	Senior Research Officer	Rs. 3,090,747.03
Dr. M. D. P. Kumarathunga	Senior Research Officer	Rs. 10,444,915.97

13. REPAIRS AND MAINTENANCE WORKS OF CRI BUILDINGS AND QUARTERS

QUARTER NO./ OFFICE BUILDINGS	TASK DESCRIPTION
HO/GR-04/04	Attached a new room
HO/GR-05/08	Attached a new room
HO/GR-02/06	Renovated the quarters
HO/GR-02/08	
HO/GR-03/11	
Other Quarters	Minor repairing - painting/carpentry & masonry works
Main office building	Repairing roofs
Agronomy Division	Repairing store rooms & roofs
Crop Protection Division	Repairing roofs
Auditorium	Repairing Floor area
Central Analytical Lab	Repairing aluminum doors & windows
Library	Covering air windows with Net

14. Engineering Services

Following major renovations and maintenance works were conducted by the Engineering Unit during the year 2022

Constructions under Capital Expenditure

1. Construction of two storied Laboratory Building Complex at BRS
2. Renovation of Old Tissue Culture Laboratory Building
3. Aluminum Partition in CPRD New lab upper floor

Constructions/ Repairs under Estate Funds

1. Repairing of existing Labor rest room at BRS
2. Repairing of existing Power line at Ambakalle Genetic Resource Centre
3. Repairing of Office Building at Maduruoya Genetic Resource Centre
4. Renovation of Labor rest room at Poththukkulama Research Centre

In addition, routine maintenance works of the buildings, quarters, vehicles, electricity lines, air conditioners & telephone, etc. were completed under recurrent expenditure.

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ஊழியர் சாதனைகள்
STAFF ACHIEVEMENTS

Awards

1. The Coconut Research Institute received the award for the Best Annual Report and final accounts (2020) in the Research institutes category organized by the Association of Public Finance and Accounts of Sri Lanka, the public sector wing of Chartered Accountants Sri Lanka on 2nd December 2022 in Colombo.

2. The Coconut Research Institute won the Gold medal for the best website in the government sector, Silver medal for the best citizen services website and the Bronze medal for the overall best website of the island at the "BestWeb.LK competition" organized by the LK Domain Registry on 30th August 2022 in Colombo.

3. The research paper on IoT-Based Disease Diagnosis and Knowledge Dissemination System for Coconut Plants, co-authored by Dr. N. S. Aratchige received one of the outstanding research papers awards at the 4th International Conference on Advancements in Computing 2022.

4. The poster presented by Jayarathna S. P. N. C., Suraweera H. G. M. R., Piyatissa N. K. L. S., Perera P. I. P. and Vidhanaarachchi V. R. M. on "Viability of heat-treated microspores of Cocos nucifera L. for induction of microspore embryogenesis" won the 1st runner-up award in the poster section at the 2nd Tissue Culture Symposium, organized by ICC-COGENT, held on 04 to 06 May 2022, Jakarta, Indonesia.

5. Dr. D.M.P.D. Dissanayake received the "Korea University Achievement Award" for the best PhD student in Fall semester, 2021.

6. Dr. D.M.P.D. Dissanayake received the "Best thesis award" awarded by the College of Life Science at Korea University in Fall semester 2021.

7. Dr. D.M.P.D. Dissanayake received the "Best publication award" awarded by the College of Life Science at Korea University in Fall semester 2021.

8. Ms. P.R. Weerasinghe received the "Best Paper Presentation Award" in the Food, Nutrition and Agriculture session of the 10th YSF Symposium 2022.

9. Dr. A.A.A.J Atapattu received the One of the Three Best PhD Students Award (2021) by the University of Chinese Academy of Sciences.

Postgraduate Studies Completed

1. Dr. D.M.P.D. Dissanayake (Senior Research Officer, Soils and Plant Nutrition Division) completed her PhD degree at Division of Environmental Sciences and Ecological Engineering, Korea University, Seoul, Korea. Her thesis titled "Sustainable Use of Biochar for Immobilization of Potentially Toxic Elements and Soil Quality Improvement in Soil Contaminated with Solar Panel Waste"

2. Dr. A.A.A.J. Atapattu, (Research Officer, Agronomy Division), completed PhD degree at CAS Key Laboratory of Tropical Forest Ecology, Xishuangbanna Tropical Botanical Garden attached to the University of Chinese Academy of Sciences. His thesis titled "Biological drivers of soil nutrient heterogeneity at fine-scale in tropical rainforests"

3. Dr. Rusitha Wijekoon (Technology Transfer Officer, Technology Transfer Division) completed his PhD degree at the University of Putra, Malaysia. His thesis titled "Determinants of economic well-being among Sri Lankan coconut growers and the role of technology adoption"

4. Mrs. D.K.R.P.L. Dissanayake (Research Officer, Agronomy Division), completed MPhil degree at the Postgraduate Institute of Agriculture, University of Peradeniya. Her thesis titled "Development of a slow-release urea fertilizer incorporating rice husk biochar to improve nutrient use efficiency in paddy cultivation"

5. Ms. H.P.D.T. Hewa Pathirana completed Degree in Master of Philosophy with the title of "Nutritional and physico- chemical properties of unfermented coconut sap and coconut jaggery collected through traditional and novel sap collection method" on 1st of April 2022.

Other Academic/Professional achievements/activities

1. Dr. D.M.P.D. Dissanayake passed the examination for the Radiation Protection Officers (RPOs) at the industrial facility held by the Sri Lanka Atomic Energy Regulatory Council.

2. Dr. H.D.M.A.C. Dissanayaka served as a reviewer of research proposals at the Research Development and Higher Degree Committee of the Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka

3. Dr. H.D.M.A.C. Dissanayaka served as a reviewer of research proposals at the Post Graduate Institute of Agriculture, University of Peradeniya

4. Dr. H.D.M.A.C. Dissanayaka served as a reviewer for the SABRAO journal of Breeding and Genetics

5. Dr. H.D.M.A.C. Dissanayaka served as a reviewer for the PGIA Congress 2022, University of Peradeniya

6. Mr. T.D. Nuwarapaksha passed the examination for the Radiation Protection Officers (RPOs) at the industrial facility held by the Sri Lanka Atomic Energy Regulatory Council.

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கல்விசார் மற்றும் தொழில்சார் செயற்பாடுகள்
ACADEMIC AND PROFESSIONAL ACTIVITIES

Supervision/evaluation of Postgraduate Students

1. Dr. I. M. S. K. Idirisinghe served as evaluator and examiner of the M Sc viva-voce examination of Mr. M. M. M. Mohammathu, Postgraduate Student of PGIA M Sc thesis titled' Assessing the Market Power of Rice Milling Industry in Sri Lanka: An Application of NEIO Approach (2022)

2. Dr. A. D. Nainanayake served as the Supervisor of Mr. P. G. P. Fernando for MSc in Analytical Chemistry with the dissertation titled "Quantification of bioactive phytochemicals and study the relationship to the growth of Panicum Maximum"– Department of Chemistry, University of Colombo, Sri Lanka in 2022.

Supervision of Undergraduate Students

1. Dr. N. S. Aratchige supervised the final year project of Ms. K. M. D. N. Karunarathne of the Uva Wellassa University of Sri Lanka. The project was "Identification of whitefly species (Hemiptera: Aleyrodidae) of coconut palms in Colombo and Gampaha districts".

2. Dr. N. S. Aratchige supervised the final year project of Ms. K.W. M. N. S. Wickramasinghe of the Wayamba University of Sri Lanka. The project was "Screening of the Susceptibility of Five Coconut Varieties to Plesispa reichei".

3. Dr. N. S. Aratchige supervised the final year project of Ms. W. H. Y. S. Fernando of Sabaragamuwa University of Sri Lanka. The project was "Effect of selected biopesticides to control Plesispa beetle (Plesispa reichei) under laboratory conditions"

4. Dr. N. S. Aratchige supervised the final year project of Mr. E. M. S. G. Ekanayaka, Mr. M. A. N. A Anawaratne, Ms. T. K. T. A Chandrasenaand Ms. G. M. D. Nandana of Sri Lanka Institute of Information Technology (SLIIT). The project was "IoT-Based Disease Diagnosis and Knowledge Dissemination System for Coconut Plants".

5. Dr. H.D.M.A.C. Dissanayaka supervised the undergraduate research student Ms. D.A.J. Kumarasinghe, Department of Agricultural Biology, University of Peradeniya. The project title was "Investigation of morphological and molecular marker segregation of an F2 Population of Coconut (Cocos nucifera L.) and deriving marker-trait association"

6. Dr. D.M.P.D. Dissanayake served as the external supervisor of Ms. H.B.J. Nawanjana, from the Department of Soil Science, Faculty of Agriculture, University of Peradeniya,

Sri Lanka. The thesis titled "Effect of Different Fertilizer Practices on Availability of Potentially Toxic Elements (PTEs) in Coconut Growing Soils in Sri Lanka".

7. Dr. D.M.P.D. Dissanayake served as the external supervisor of Ms. M.G.S.D. Nandasena from the Department of Plant Science, Faculty of Agriculture, Rajarata University of Sri Lanka. The thesis titled "Effect of Different Fertilizer Practices on Nitrogen Availability in Coconut Growing Soils in the Intermediate Zone of Sri Lanka".

8. Mr. P.H.P.R. De Silva supervised the Industrial Training of Ms. K.M.D.M. Karunaratne, undergraduate student from the Faculty of Agricultural Sciences and Export Agriculture, Uva Wellassa University for two months from 10.06.2022 to 10.08.2022 on "Laboratory techniques in Plant Pathology and Molecular Biology".

9. Mr. P.H.P.R. De Silva supervised the Industrial Training of Ms. W.H.Y. Sanjana Fernando, undergraduate student from the Faculty of Agricultural Sciences, University of Sabaragamuwa for four months from 23.08.2022 to 02.12.2022 on "Laboratory techniques in Plant Pathology and Molecular Biology".

10. Dr. A.A.A.J Atapattu and Mrs. S. S. Udumann served as the external supervisors of undergraduate student Miss. R.S.M. Mendis, Bachelor of Technology 2022, Department of Biosystem Technology, Commercial green farming, Faculty of Technology, University of Jaffna, Sri Lanka. The thesis titled "Evaluation of the feasibility of using different invasive plant species as raw materials for vermi-compost production".

11. Dr. A.A.A.J Atapattu and Mrs. D.K.R.P.L. Dissanayake served as the external supervisors of undergraduate student Miss. R.M.A.N. Saumya, Bachelor of Technology 2022, Department of Biosystem Technology, Commercial green farming, Faculty of Technology, University of Jaffna, Sri Lanka. The thesis title is "Utilization of agricultural residues as biochar for sustainable coconut plantation".

12. Dr. A.A.A.J Atapattu and Mrs. D.M.N.S. Dissanayake served as the external supervisors of undergraduate student Miss. T.M.E.P. Thelwadana, Bachelor of Science in Palm and Latex Technology & Value Addition 2022, Department of Export Agriculture, Faculty of Animal Science and Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka. The thesis titled "Seed treatments and growth performance evaluation Of Sunn Hemp (Crotalaria juncea L.) as an effective cover crop under major coconut growing soils".

13. Dr. A.A.A.J Atapattu and Mrs. D.K.R.P.L. Dissanayake served as the external supervisors of undergraduate student Miss. E.M.G.N. Ekanayaka, Bachelor of Science in Palm and Latex Technology & Value Addition 2022, Department of Export Agriculture, Faculty of Animal Science and Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka. The thesis titled "Sustainable utilization of king coconut husk as feedstock in biochar production with the highest conversion efficiency and nitrogen retention".

14. Dr. A.A.A.J Atapattu and Mrs. S. S. Udumann served as the external supervisors of undergraduate student Miss. H.J.M.P.M. Jayasinghe, Bachelor of Science in Agro-Industry Management 2022, Faculty of Agriculture, Aquinas College of Higher Studies, Colombo 8, Sri Lanka. The thesis titled "Evaluating the feasibility of Megathyrsus maximus (Guinea grass) as a fodder at different harvesting intervals".

15. Dr. A.A.A.J Atapattu and Mrs. D.K.R.P.L. Dissanayake served as the external supervisors of undergraduate student Miss. D.M.S.D. Dassanayake, Bachelor of Science in Agro-Industry Management 2022, Faculty of Agriculture, Aquinas College of Higher Studies, Colombo 8, Sri Lanka. The thesis titled "Determination of optimum cut size and dehydrated time of king coconut husk for ash production".

16. Dr. A.A.A.J Atapattu and Mrs. S. S. Udumann served as the external supervisors of undergraduate student Miss. N.C. Widanapathirana, Bachelor of Technology 2022, University of Sri Jayewardenepura, Sri Lanka. The thesis titled "Effects of super absorbent polymers and irrigation interval on the growth and yield performance of Capaicum annum grown in coconut growing sandy soil".

17. Dr. A.A.A.J Atapattu and Mrs. D.K.R.P.L. Dissanayake served as the external supervisors of undergraduate student Mr. B.T. Sandakelum, Bachelor of Technology 2022, University of Sri Jayewardenepura, Sri Lanka. The thesis titled "Sustainable utilization of weeds in coconut Lands as a feedstock in biochar production with highest conversion efficiency".

18. Dr. A.A.A.J Atapattu and Mr. T. D. Nuwarapaksha served as the external supervisors of undergraduate student Mr. R.P.U.N. Rajapaksha, Bachelor of Science in Animal Science and Fisheries (2022), Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka. The thesis titled "Economic feasibility of integrating goats into the underutilized pastures in coconut lands under Coconut Research Institute, Sri Lanka".

19. Dr. A.A.A.J Atapattu and Mrs. S. S. Udumann served as the external supervisors of undergraduate student Mr. G.S.S. Kumara, Bachelor of Science in Animal Science and Fisheries 2022, Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka. The thesis titled "Utilization of Azolla and Guinea Grass as Silage in Sri Lanka".

20. Dr. A.A.A.J Atapattu and Mr. T. D. Nuwarapaksha served as the external supervisors of undergraduate student Miss. D.M.W.K. Dissanayake, Bachelor of Science in Plantation Management 2022, Faculty of Agriculture and Plantation Management, Wayamba University, Makadura, Gonawila, Sri Lanka. The thesis titled "Evaluating the feasibility of Tithonia diversifolia as a pottasium source at different harvesting intervals".

21. Ms. H. P. D. T. Hewapathirana and Dr. C. Yalegama supervised Ms. A.M.K.P Adhikari undergraduate student from Sabaragamuva University of Sri Lanka. The thesis titled "Formulation of instant flavored beverage powder for milk of virgin coconut oil residue" in 2022

22. Ms. H. P. D. T. Hewapathirana supervised Ms. A.D.S.R Jayasinghe undergraduate student from Sabaragamuva University of Sri Lanka. The thesis titled "Effect of pH, enzyme and bacteria culture on virgin coconut oil yield from coconut milk" in 2022

23. Ms. H. P. D. T. Hewapathirana supervised Ms. K.G.N.N. Kodagoda undergraduate student from Sabaragamuva University of Sri Lanka. The thesis titled "Food applications, sensory analysis and quality characterization of edible food wrap from coconut protein isolate" in 2022

24. Ms. H. P. D. T. Hewapathirana and Dr. C. Yalegama supervised Mr. U.K.D.T. Dhananjaya undergraduate student from Wayamba University of Sri Lanka. The thesis titled "Development of a "Pittu mix" Containing Defatted Desiccated Coconut Kernel and Rice Flour" in 2022

25. Dr. Chandi Yalegama and Ms. B.G.R.R Bandara supervised Ms. A.A.S.K Amarasinghe undergraduate student from Jaffna University of Sri Lanka. The research project titled "Development of a Plant-Based Yoghurt Using Dehydrated Defatted Desiccated Coconut", in 2022.

26. Ms. B.G.R.R Bandara and Dr. Chandi Yalegama supervised Ms. K.A.M Sewwandi, undergraduate student from South Eastern University of Sri Lanka. The research project titled "Development of ready to serve nutritional porridge based on defatted coconut milk and rice", in 2022.

27. Ms. B.G.R R Bandara and Dr. Chandi Yalegama supervised Ms. S.K.A.I.H Senarathna, undergraduate student of Sabaragamuwa University of Sri Lanka. The research project titled "Comparative assessment of the effectiveness of fresh coconut paste over conventional coconut milk for domestic usage", in 2022.

28. Ms. B.G.R.R Bandara and Ms. H.P.D.T Hewa Pathirana supervised Mr. K.G.C.N. Rajapaksha, undergraduate student from Sabaragamuwa University of Sri Lanka. The research project titled "Effect of steaming and drying treatments on physicochemical properties of coconut paring oil", in 2022.

29. Ms. B.G.R.R Bandara supervised Mr. D. R. S. K. Pathirana, undergraduate student from Sabaragamuwa University of Sri Lanka. The research project titled "Fabrication of fuel briquette from coconut industry based agricultural wastes", in 2022.

Internships and Supervision of Diploma Students

1. Miss. J.H.M.S. Jayamaha, a student from Advanced Technological Institute, Naiwala underwent 6 months of internship training at Agronomy Division from 2022.05.04.

2. Miss. G.T.S. Karunarathna, a student from Advanced Technological Institute, Naiwala underwent 6 months of internship training at Agronomy Division from 2022.05.04.

3. Mr. K.V.S.S. Perera, a student from Advanced Technological Institute, Naiwala underwent 6 months of internship training at Agronomy Division from 2022.11.21.

4. Miss. K.A.S.S. Hettiarachchi, a student from Advanced Technological Institute, Naiwala underwent 6 months of internship training at Agronomy Division from 2022.11.21.

5. Ms. T.H. Chandrathilake, supervised Ms. K. A.S. Nawodya Sewwandi, a student from Department of Bio systems Technology, Faculty of Technology, South Eastern University of Sri Lanka during her in-plant training from June – November 2022.

6. Dr. A.D. Nainanayake supervised Ms. Y. W. C. Kumarathunga, a student from Department of Crop Science, Faculty of Agriculture, University of Peradeniya during her in-plant

training from September - December 2022.

7. Ms. T. H. Chandrathilake, supervised the in-plant training of Ms. B.M. Dulakshika Balasooriya, a student from Technical College, Kuliyapitiya from February – August, 2022.

8. Ms. T. H. Chandrathilake, supervised the in-plant training of Ms. K. Imesha Fernando, a student from Technical College, Kuliyapitiya from February – August, 2022.

9. Ms. T. H. Chandrathilake, supervised the in-plant training of Ms. Dinushi Maheshika Madhushani, a student from Technical College, Kuliyapitiya from February – August, 2022.

10. Ms. T. H. Chandrathilake, supervised the in-plant training of Mr. H. M. H. R Herath, a student of Higher National Diploma, Agriculture Production Technology, School of Agriculture, Pelwehera from March - September, 2022.

11. Dr. H.D.M.A.C. Dissanayaka supervised the industrial trainings of Ms. P.P.V. S. Wickramasinghe, Undergraduate student of Department of Biosystems Technology, Faculty of Technology, University of Jaffna.

12. Dr. H.D.M.A.C. Dissanayaka supervised the industrial trainings of Mr. Ravindu Induwara Mampitiya, Undergraduate student of Horizon Campus, Malambe.

13. Following Students were trained under internship at the Coconut Processing Research Division during 2022

14. Ms. W.A.K. Fernando, a student from Eastern University of Sri Lanka, underwent her internship training at Coconut Processing Research Division during 2022

15. Ms.W.A.C.A. Imbulgoda, a student from Sri Lanka Institute of Information Technology Malabe Campus, underwent her internship training at Coconut Processing Research Division during 2022

16. Ms. J.A.Upeksha Piyumi, a student from Sri Lanka Institute of Information Technology Malabe Campus, underwent her internship training at Coconut Processing Research Division during 2022

17. Ms. J.H.M.S. Jayamaha, a student from Advanced Technological Institute, Naiwala, underwent her internship training at Coconut Processing Research Division during 2022

Serving as Referees

1. Dr. D.M.P.D. Dissanayake served as a referee for the 11th YSF Symposium organized by National Science and Technology Commission (NASTEC) of Sri Lanka.

2. Dr. D.M.P.D. Dissanayake served as a referee for the International Research Conference (IRC 2022) organized by the Sri Lanka Technological Campus.

3. Dr. D.M.P.D. Dissanayake served as a reviewer for the COCOS journal

4. Dr. D.M.P.D. Dissanayake served as a reviewer for the Journal of Soil Science Society of Sri Lanka.

5. Dr. D.M.P.D. Dissanayake served as a reviewer of several SCI indexed journals (Canadian Journal of Soil Science, Frontiers in Environmental Science, Chemosphere, Environmental Geochemistry and Health, Environmental Pollution, Geoderma, Science of the Total Environment).

6. Dr. A.A.A.J. Atapattu served as Member (Judging panel): Special Project presentation of students of 14th Intake, B.Sc. (Plantation Management), Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka

7. Dr. A.A.A.J. Atapattu served as Member (Judging panel): Final year research presentations, B.Sc. (Animal Science and Fisheries), Department of Animal Science, Faculty of Agriculture, University of Peradeniya.

8. Dr. A. D. Nainanayake served as a reviewer for the Journal of the Rubber Research Institute of Sri Lanka in 2022.

9. Dr. A.A.A.J. Atapattu served as a reviewer of several SCI indexed journals (Agroforestry Systems, Tropical Ecology, Crops, Agronomy, Applied Sciences, Microorganisms, Forests, Agriculture, Horticulturae, World, Sustainability, Soil Systems and Remote Sensing).

Serving as Visiting Lecturers

1. Dr. D.M.P.D. Dissanayake served as a guest lecturer for the postgraduate course on Global Internship, Korea University, South Korea in Spring 2022

Serving as a Reviewer

1. Dr. I. M. S. K. Idirisinghe served as a Peer Reviewer of the International Coconut Community CORD Journal and reviewed the manuscript “The Coconut Industry: A Review of Price Forecasting Modelling in Major Coconut Producing Countries” by M.G.D Abeysekara and K.P Waidyarathne

Serving as a Resource Persons

1. Dr. I.M.S.K. Idirisinghe served as a consultant to Fairtrade Original NL and Fairtrade International (Bony –Germany and for ETC Lanka, Nawala Road, Rajagiriya, Colombo in Sri Lanka to define the key characteristics of sustainable production model for coconuts grown by Sri Lankan small holders in order to identify productivity benchmarks for sustainable target yields and viable farm size and to contribute to design the survey.

2. Dr. A.D. Nainanayake served as a resource person for the One Day Training Program conducted for coconut growers by the Coconut Research Institute in 2022.

3. Dr. A.D. Nainanayake represented the Coconut Research Institute and served as a resource person in the "Joint Climate Change Dialogue in Sri Lanka 2022 and Beyond", organized by the Embassy of the Kingdom of the Netherlands and International Water Management Institute on 27th October, 2022, at Hilton, Colombo.

4. Dr. A.D. Nainanayake served as a resource person and made a presentation on "Technology for the improvement of shelf-life of king coconut for the export market" for the registered entrepreneurs through zoom technology on 16.09.2022

5. Dr. A.D. Nainanayake served as a resource person and made a presentation on "Technology for the improvement of shelf-life of king coconut for the export market" for the registered entrepreneurs through zoom technology on 19.10.2022

6. Dr. A.D. Nainanayake served as a resource person and made a presentation on "Biology and Ecophysiological requirements of coconut palm" for the Plantation diploma program of the Institute of Plantation Management, Athurugiriya on 04.11.2022

7. Dr. A.D. Nainanayake served as a resource person and made a presentation on "Climate factors and its effect on coconut production" for the Plantation diploma program of the Institute of Plantation Management, Athurugiriya on 13.11.2022

8. Ms. T.H. Chandrathilake served as a resource person and made a presentation on "Importance of coconut harvesting" for the Plantation diploma program of the Institute of Plantation Management, Athurugiriya on 19.11.2022

9. Dr. N.S. Aratchige served as the resource person in four programs on whitefly management in coconut (organized for the officers of the Coconut Cultivation Board, Chilaw Plantations Ltd, Department of Agriculture and coconut industrialists).

10. Dr. N. S. Aratchige served as a resource person to deliver a lecture on Pest and disease management of coconut at the Diploma program for planters of the National Institute of Plantation Management.

11. Dr. N.S. Aratchige served as a resource person on two training programs on oil palm cultivation, conducted by the National Institute of Plantation Management.

12. Dr. N.S. Aratchige served as a resource person in Research-Extension Diolgues and made presentations on Whitefly control.

13. Dr. N.S. Aratchige served as a resource person to deliver lectures for the Assistant Coconut Development Officers in the training program organized by Coconut Cultivation Board on 21st November 2022.

14. Ms. M.K.F. Nadheesha served as resource person in research extension dialog conducted by Coconut Research Institute.

15. Ms. M.K.F. Nadheesha served as a resource person in one day training programs conducted by Coconut Research Institute.

16. Ms. M.K.F. Nadheesha served as a resource person and delivered lectures to students of National Institute of Plantation Management conducted by Coconut Research Institute.

17. Dr. D.M.P.D. Dissanayake served as a resource person in Training program for the new research officers conducted by the Coconut Research Institute of Sri Lanka on 26th April 2022.

18. Dr. A.A.A.J, Atapattu served as a resource speaker in the Workshop on Good Agriculture Practices (GAP) by the International Coconut Community (ICC) and Coconut Development Board of India in Kochi, India from 2nd - 4th September, 2022.

19. Dr. A.A.A.J. Atapattu served as a resource person in the webinar on Crop Diversification towards Sustainable Plantation Industry by the National Institute of Plantations Management (NIPM) on the 19th April 2022.

20. Dr. A.A.A.J. Atapattu served as a resource person in a radio program on How to manage your coconut land productively, "Subhaarathi" Live Discussion Forum, Swadeshiya Sewaya, Sri Lanka Broadcasting Corporation on the 5th of April, 2022.

21. Dr. A.A.A.J Atapattu, Mrs. S.S. Udumann and Mrs. D.K.R.P.L Dissanayake served as resource persons in a radio program on Productivity improvement through intercropping, "Subhaarathi" Live Discussion Forum, Swadeshiya Sewaya, Sri Lanka Broadcasting Corporation on the 11th January 2022.

22. Dr. A.A.A.J. Atapattu served as a resource person in a radio program on How to increase coconut production, "Subhaarathi" Live Discussion Forum, Swadeshiya Sewaya, Sri Lanka Broadcasting Corporation on the 4th January 2022.

23. Dr. D.M.P.D. Dissanayake served as a resource person in one day training programs conducted by Coconut Research Institute.

24. Dr. D.M.P.D. Dissanayake served as a resource person and delivered lectures for the students of "National Diploma in Plantation Management for the Planters" conducted by National Institute of Plantation Management on 6th and 13th November 2022.

25. Dr. D.M.P.D. Dissanayake served as a resource person to deliver lectures for the Assistant Coconut Development Officers in the training program organized by Coconut Cultivation Board on 21st November 2022.

26. Ms. B.H.R. Fernando served as a resource person in one day training programmes conducted by Coconut Research Institute.

27. Ms. B.H.R. Fernando served as a resource person and delivered lectures for the students of "National Diploma in Plantation Management for the Planters" conducted by National Institute of Plantation Management on 12th November 2022.

28. Ms. B.H.R. Fernando served as a resource person and delivered lectures for the Coconut Development officers in the Coconut Development Officers' training program organized by Coconut Cultivation Board on 22nd November 2022.

29. Mr. P.H.P.R. De Silva served as a resource person for the "National Diploma in Plantation Management" course conducted by NIPM and delivered a lecture titled "Diseases of coconut and their management".

30. Mr. P.H.P.R De Silva, Mrs. D.H. Dilrukshika and Ms.D.P.M. Silva served as interview panel members for the recruitment of Field Inspectors for the Weligama Coconut Leaf Wilt disease management project.

31. Mr. P.H.P.R De Silva, Mrs. D.H. Dilrukshika and Ms. D.P.M. Silva served as resource persons of the virtual certificate course conducted on "Coconut cultivation and value-added products" for coconut growers and stakeholders.

32. Mr. P.H.P.R De Silva served as resource person at the Research-Extension Dialogue and made a presentation on "Pests and Diseases Management of Coconut".

33. Dr. A.A.A.J Atapattu served as a Resource person and delivered lectures on Structure and the Functions of Soil, Advanced Certificate Course in Organic Agriculture and Plantation Management, National Institute of Plantations Management (NIPM), Sri Lanka.

34. Dr. A.A.A.J Atapattu served as a Resource person and delivered lectures on Nutrient Content & Properties of Major Soil Groups, Advanced Certificate Course in Organic Agriculture and Plantation Management, National Institute of Plantations Management (NIPM), Sri Lanka.

35. Dr. H.D.M.A.C. Dissanayaka conducted a guest lecture at the Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka.

36. Mr. O.S. Thilakarathne served as a resource person for the "National Diploma in Plantation Management course conducted by NIPM and delivered a lecture titled "Coconut varieties of Sri Lanka".

37. Dr. A.A.A.J Atapattu served as a resource person for the One Day Training Programs conducted for coconut growers by the Coconut Research Institute in 2022.

38. Dr. A.A.A.J Atapattu served as a resource person in Research-Extension Diolgues and made presentations on Coconut cultivation practices.

39. Dr. A.A.A.J Atapattu served as a resource person and made a presentation on "Coconut based Farming Systems" for the Plantation diploma program of the Institute of Plantation Management (NIPM) on 19th November 2022.

40. Dr. A.A.A.J Atapattu served as a resource person to deliver lectures for the Assistant Coconut Development Officers in the training program organized by Coconut Cultivation Board on 21st November 2022.

41. Dr. A.A.A.J Atapattu served as a resource person in Training program for the new research officers conducted by the Coconut Research Institute of Sri Lanka on 26th April 2022.

42. I M S K Idirisinghe Served as a resource person to "Haritha TV" on Minimizing Coconut Waste

43. I M S K Idirisinghe and Rusitha Wijekoon (2022) Served as a resource person to ITN TV on "Pini Viyana", on How Coconut Industry Can Contribute Earn More Foreign Exchange Saving Coconut, on 3rd May 2022

Presentations made by the Staff

1. Dr. C. S. Ranasinghe presented the country paper on Status of Coconut Sector Development in Sri Lanka at the 58th ICC Session & Ministerial Meeting (virtual), 28-30 November 2022, Jakarta, Indonesia

2. Mr. P.H.P.R De Silva made two presentations titled "Current status and the Weligama Coconut Leaf Wilt Disease management programme in the Southern province" for the District Coordinating Committee (DCC) of the Matara district at the divisional secretarial, Matara and DCC of the Hambantota district at the divisional secretarial, Hambantota.

3. Dr. Rusitha Wijekoon presented the First In-House Seminar on "Determinants of the economic well-being of the Sri Lankan coconut growers and the role of technology adoption". Coconut Research Institute.

4. Dr. A.A.A.J Atapattu presented the Second In-House Seminar on "Biological drivers of soil nutrient heterogeneity at fine-scale in tropical rainforests", Coconut Research Institute.

5. Lalith Perera, I M S K Idirisinghe & W M Rathnayake (2022) "Coconut Research & Promotion and International Cooperation for Poverty Alleviation in Sri Lanka", China (Yunnan)—Sri Lanka Forum on Poverty Alleviation through Agricultural Innovation, Yunnan Academy of Agricultural Sciences, Kunming, Yunnan, China, 22-24 June 2022

6. Jayalath, K.V.N.N. and Weerahewa, J. (2022). Impacts of food safety border inspections on coconut-kernel exports from Sri Lanka: Analysis of the Rapid Alert System for food and feed (2009-2021). Fifteenth Annual Research Forum of Sri Lanka Agricultural Economics Association held on 29th April, 2022, Uwa Wellassa University of Sri Lanka.

7. I.M.S.K. Idirisinghe, Booming coconut industry and future expectations, Polpawath, volume 1, April, 2022

Serving in Committees / Meetings / Workshops

1. Dr. C.S. Ranasinghe represented the Coconut Research Institute in the following committees.

    i. Local Project Appraisal Committee, UNDP

    ii. National Committee on Plantation Sector, SLCARP

    iii. Subcommittee of Coconut sector policy, Ministry of Plantation

    iv. Board of Directors - Coconut Cultivation Board (CCB)

    v. Board of Directors – Kapruka Fund, CCB

    vi. Board of Directors – National Institute of Plantation Management (NIPM)

vii. Academic Board, NIPM

viii. Scientific Advisory Committee on Tea Physiology, Tea Research Institute (TRI)

2. Dr. A.A.F.L.K. Perera represented the Coconut Research Institute in the following committees.

   i. Technical Working Group, International Coconut Community (ICC)

   ii. Steering Committee - International Coconut Genetic Resources Network (COGENT)

   iii. Scientific Advisory Committee on Tea Breeding Research, Tea Research Institute (TRI)

   iv. Sub Committee-Steering Committee on Coconut Industry Development, Ministry of Plantation

   v. Board of Study– Faculty of Plantation Management, Wayamba University

3. Dr. N. S. Aratchige represented the Coconut Research Institute in the following committees.

   i. Pesticide Subcommittee of the Department of Agriculture

   ii. Organic Pesticides subcommittee of the Ministry of Plantation Industries

   iii. Golden Shareholder Meetings of the Regional Plantation Companies, Ministry of Plantation Industries

   iv. National Committee on Pesticide Technical Advisory Committee. (PeTAC)

   v. Committee to make recommendations on the implementation of the orders given by His Excellency the President on the subject of oil palm cultivation in Sri Lanka

   vi. Validation Workshop on B. Tech in Plantation Crop Technology and Management of the National Institute of Plantation Management

   vii. Committee on importation of areca nut for value addition, Board of Investment

4. Dr. I.M.S.K. Idirisinghe represented the Coconut Research Institute in the following committees

   i. Member of Committee on Importing Frozen Kernel, Ministry of Plantation

   ii. Committee Member of National Committee on Socio Economics and Policy Analysis, Sri Lanka Council for Agricultural Research Policy.

   iii. Member of Advisory Committee on Coconut Fiber and Substrate of Export Development Board.

iv. Member of Advisory Committee on Coconut Fiber and Substrate of Ministry of Industries.

v. Chairman to local coconut auction in CRI 2020 to date

vi. Focal point representative of online alert for trade obstacles mechanism to facilitate export and related industries in line with the exporters forum of EDB

5. Dr. D.M.P.D. Dissanayake represented the Coconut Research Institute in the following committees.

i. Executive committee member of the Soil Science Society of Sri Lanka

ii. Committee member and a member of judging panel of the Inter-school quiz competition on "Soil for Life" conducted by the Soil Science Society of Sri Lanka.

iii. Committee member of the Technical Evaluation Committee for purchasing soil auger, Industrial Technology Institute (ITI).

6. Dr. A.A.A.J. Atapattu represented the Coconut Research Institute in the following committees.

i. Chairman of the Scientific and Technical Committee - Increase productivity of CRI estates, Coconut Research Institute for Sri Lanka

ii. Member of Monitoring committee on converting CRI research/genetic resource centres into model gardens, Coconut Research Institute for Sri Lanka

iii. Co-chair in Technical Session 2: Moving towards Sustainable Agriculture - GAP and its relevance in the context of Climate Change, Workshop on Good Agriculture Practices (GAP) by ICC and CDB-India, Kochi, India

iv. Member of Technical committee on the development of Good Agricultural Practices (GAP) guidelines for coconut-growing countries, the International Coconut Community (ICC)

v. Member (Agricultural Sector) of the Building the technical capacity of institutions to implement 2050 carbon net zero road map and strategic plan for Sri Lanka by the United Nations Development Programme (UNDP) and Ministry of Environment.

vi. Member of the Fertilizer Advisory Committee of the National Fertilizer Secretariat, Ministry of Agriculture.

vii. Consultant (Coconut sector) of the Climate-Smart Project Funded by IAEA regular programme of technical cooperation 2022-2023 (Project SRL 5051), Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka.

viii. External expert of the Curriculum Revision Committee, Faculty of Technology, University of Jaffna.

ix. Member of the Inter-Institutional Committee on Establishment of the University of Plantation Research and Management (UPRM)

x. Member of the Coconut Fertilizer Steering Committee, Ministry of Plantation Industries

xi. Consultant (Coconut sector) of the Agroforestry Mainstreaming in Tea and Coconut in Sri Lanka by the Netherlands Enterprise Agency (RVO) and International Union for Conservation of Nature (IUCN).

xii. Member of the Board of Study (2021-2022), Advanced Certificate Course in Organic Agriculture and Plantation Management, National Institute of Plantations Management (NIPM).

xiii. Member of the Industrial Advisory Board, Department of Agricultural and Plantation Engineering at the Open University of Sri Lanka.

xiv. Dr. A.A.A.J. Atapattu represented as Radiation Protection Officer of the Coconut Research Institute for Sri Lanka Atomic Energy Board.

7. Dr. H.D.M.A.C. Dissanayaka represented the Coconut Research Institute in the following committees.

   i. Alternative representative of the COGENT steering committee, International Coconut Community

   ii. CRI representative in the FAO project on Implementation of National Biosafety Framework in accordance with Cartagena Protocol on Biosafety (2019-2022)

8. Ms. K V N N Jayalath represented the Coconut Research Institute in the following committees.

   i. Coordinator for the INFORM data base management 2022, conducted by the Council for Agricultural Research Policy.

   ii. Executive Committee Member and Treasure of Sri Lanka Agricultural Economics Association in 2022/2023.

   iii. Coordinator for the Establishment of Media Unit and Statistical Information System by the Ministry of Plantation.

   iv. Representative from CRI for Coordination and Supervision of Research, Development and Information Management related to “Kapruka Fund”

9. Mr. C.R.K. Samarasinghe served as a member of the Estate Committee of the Coconut Research Institute, Sri Lanka

10. Dr. A.D. Nainanayake represented the Coconut Research Institute in the following committees.

    i. Served as a member of the judging panel in the external degree program of the Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka in 2022.

    ii. served as a member of the committee to form NVQ level III, toddy tapping training collaboration with National Apprentice and Industrial Training Authority of Sri Lanka 2022

11. Mr. P.H.P.R. De Silva served as a member of the Weligama Coconut Leaf Wilt Disease management steering committee.

12. Mrs. D.H. Dilrukshika severed as a member of the Science and Technical Committee for Estate development of the Coconut Research Institute.

13. Dr. Chandi Yalegama served as a member of the board of study, Professional Program in Coconut Processing (Technology and practices), National Institute of Plantation Management of Sri Lanka (2021-2022) :(Development of curriculum for under graduate program in 2022).

14. Dr. Chandi Yalegama served as a member of the committee to form NVQ level III, toddy tapping training collaboration with National Apprentice and Industrial Training Authority of Sri Lanka 2022.

15. Ms. Kumudu Malkanthi, Research Officer (Mechanical Engineer) of Coconut processing Research Division served as a Member of National committee on agricultural mechanization, CARP during 2022.

Local/international training programs/workshops attended

1. Ms. B.H.R. Fernando attended to a workshop (online) "Three-Day International Workshop on Statistical Data Analysis and Interpretation using R-programming" conducted by Department of Research and Publications, A2Z EduLearningHub LLP, India on 27th, 28th and 29th September 2022.

2. Ms. A.A.R.W. Abeysinghe attended a virtual short course on "Statistical Modeling" organized by Institute of Biology Sri Lanka in March 2022.

3. Ms. A.A.R.W. Abeysinghe attended a workshop on "Enhance Plantation Land Productivity through Applied Soil Conservation Methods" conducted by National Institute of Plantation Management on 26th May 2022.

4. Ms. A.A.R.W. Abeysinghe attended to a workshop (online) "Three-Day International Workshop on Statistical Data Analysis and Interpretation using R-programming" conducted by Department of Research and Publications, A2Z EduLearningHub LLP, India on 27th, 28th and 29th September 2022.

5. Ms. A.A.R.W. Abeysinghe attended a workshop on "Research Skills Strengthening

Workshop Series: Building a Research Idea and Proposal Writing" organized by National Research Council of Sri Lanka on 30th September 2022.

6. Dr. D.M.P.D. Dissanayake completed the National Training Course on Radiation Protection organized by the Sri Lanka Atomic Energy Regulatory Council from 30th August to 1st September 2022.

7. Dr. D.M.P.D. Dissanayake attended the virtual awareness programme on Intellectual Property: basics of copyright conducted by the National Science Foundation of Sri Lanka on 14th October 2022.

8. Dr. D.M.P.D. Dissanayake attended "Biochar deep dive" digital conference organized by the International Biochar Initiative on 11th October 2022 via virtual platform.

9. Ms. B.H.R. Fernando attended the 34th Annual Congress (online) of the Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka on 18th November 2022.

10. Ms. B.H.R. Fernando attended the "Regional Conference on Biosafety through the National Biosafety Project" (online) organized by Ministry of Environment, Sri Lanka on 10th and 11th March 2022.

11. Ms. T. H. Chandrathilake participated for the training course on Statistical modelling conducted by IOBSL in January through zoom technology

12. Ms. T. H. Chandrathilake participated for the training course on "Capacity Development training session of national climate change data sharing network" conducted by the Ministry of Environment on 19th October 2022 at IT center of PIM.

13. Mr. T.D. Nuwarapaksha completed the National Training Course on Radiation Protection organized by the Sri Lanka Atomic Energy Regulatory Council from 30th August to 1st September 2022.

14. Mr. T.D. Nuwarapaksha attended a workshop on "Enhance Plantation Land Productivity through Applied Soil Conservation Methods" conducted by National Institute of Plantation Management on 26th May 2022.

15. Mr. T.D. Nuwarapaksha attended a workshop on "Research Skills Strengthening Workshop Series: Building a Research Idea and Proposal Writing" organized by National Research Council of Sri Lanka on 30th September 2022.

16. Mrs. D.M.N.S. Dissanayaka attended a workshop on "Enhance Plantation Land Productivity through Applied Soil Conservation Methods" conducted by National Institute of Plantation Management on 26th May 2022.

17. Mrs. D.M.N.S. Dissanayaka attended a workshop on "Research Skills Strengthening Workshop Series: Building a Research Idea and Proposal Writing" organized by National Research Council of Sri Lanka on 30th September 2022

18. Ms. D.P.M. Silva attended a virtual short course on "Statistical Modeling" organized by Institute of Biology Sri Lanka in March 2022.

19. Mrs. D.H. Dilrukshika attended a virtual short course on "Statistical Modeling" organized by Institute of Biology Sri Lanka in March 2022.

20. 20 Mr. P.H.P.R. De Silva attended a virtual short course on "Metagenomics and Metabarcording" organized by Institute of Biology Sri Lanka in March and August 2022.

21. 21 Dr. A.A.A.J Atapattu attended training program on The Present & Future of Smart Farming in Korea by The Ministry of Agriculture, Food and Rural Affairs (MAFRA), Korea from 25th to 26th October 2022 (Online).

22. Ms. Dilani Hewa Pathiran, participated (online) in Seminar series conducted by Chinese Government under the China Multilateral Programmes (online) in collaboration of Ministry of commerce on Agriculture, China on Biotechnology Application for Developing countries from 7th November to 6th of December 2022.

23. Ms. B.G.R.R Bandara and Ms. J.A.K.M Fernando participated two-day training workshop on 'Know Analytical Instruments for the material characterization and Interpretation of the Results' conducted by Industrial Technology Institute of Sri Lanka.

24. Ms. B.G.R.R Bandara and Ms. H.P.D.T Hewa Pathirana participated the international training course on Contribution of Food Science and Technology to the Next Normal of Food Industry conducted by National Food Institute of Thailand and Sponsored by Thailand International Cooperation Agency (TICA) Ministry of Foreign Affairs of the Kingdom of Thailand.

25. Ms. B.G.R.R Bandara participated the seminar series conducted by Chinese Government under the China Multilateral Programmes (online) in collaboration with Wuhan Textile University, China on Cotton Processing from 8th November 2022 to 28th November, 2022.

26. Ms. Gangani Weerasinghe participated in the seminar series conducted by the China Multilateral Programs (online) on Youth entrepreneurship for developing countries from 02nd to 22nd December, 2022.

27. Mr. S.S. Rajapaksa participated in the seminar series conducted by Chinese Government under the China Multilateral Programmes (online) on Enhancement of ecological agriculture value chains for developing countries from 01st to 10th November, 2022.

28. Mr. D.W.L. Lilruksha and Ms. T.M.S.G. Weerasinghe participated in the seminar series conducted by the China Multilateral Programmes (online on Emerging technologies in Postharvest handling & logistics of fruits and vegetables from 4th to 24th November, 2022.

29. Mr. J. A. D. Madusanka, Ms. A. M. L. Silva, Ms. C. A. T. D. Chandrapeli and Ms. L.M. I. Senarathne participated in the seminar series conducted by the China Multilateral Programmes (online) on Import and export food inspection and food safety for officials of developing countries from 8th to 29th November, 2022

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உள்நாட்டு மற்றும் வெளிநாட்டுப் பதிப்புக்கள்
LOCAL & INTERNATIONAL PUBLICATIONS

Science Citation Indexed Journals

1. Dissanayake, P.D., Yeom, K.M., Sarkar, B., Alessi, D.S., Hou, D., Rinklebe, J., Noh, J.H., Ok, Y.S. 2022. Environmental impact of metal halide perovskite solar cells and potential mitigation strategies: A critical review. Environmental Research, 115066. (IF: 8.431).

2. Yuan, X., Wang, J., Deng, S., Dissanayake, P.D., Wang, S., You, S., Yip, A.C., Li, S., Jeong, Y., Tsang, D.C. and Ok, Y.S., 2022. Sustainable food waste management: synthesizing engineered biochar for CO2 capture. ACS Sustainable Chemistry & Engineering, 10(39), pp.13026-13036. (IF: 9.224).

3. Xiong, T., Ok, Y.S., Dissanayake, P.D., Tsang, D.C., Kim, S., Kua, H.W. and Shah, K.W., 2022. Preparation and thermal conductivity enhancement of a paraffin wax-based composite phase change material doped with garlic stem biochar microparticles. Science of the Total Environment, 827, p.154341. (IF: 10.753).

4. Dissanayake, P.D., Kim, S., Sarkar, B., Oleszczuk, P., Sang, M.K., Haque, M.N., Ahn, J.H., Bank, M.S. and Ok, Y.S., 2022. Effects of microplastics on the terrestrial environment. Environmental Research, 209, p.112734. (IF: 8.431).

5. Sarkar, B., Dissanayake, P.D., Bolan, N.S., Dar, J.Y., Kumar, M., Haque, M.N., Mukhopadhyay, R., Ramanayaka, S., Biswas, J.K., Tsang, D.C. and Rinklebe, J., 2022. Challenges and opportunities in sustainable management of microplastics and nanoplastics in the environment. Environmental Research, 207, p.112179. (*These authors contributed equally as first authors) (IF: 8.431).

6. Dissanayake, P.D., Palansooriya, K.N., Sang, M.K., Oh, D.X., Park, J., Hwang, S.Y., Igalavithana, A.D., Gu, C. and Ok, Y.S., 2022. Combined effect of biochar and soil moisture on soil chemical properties and microbial community composition in microplastic-contaminated agricultural soil. Soil Use and Management. (IF: 3.672).

7. Palansooriya, K.N., Li, J., Dissanayake, P.D., Suvarna, M., Li, L., Yuan, X., Sarkar, B., Tsang, D.C., Rinklebe, J., Wang, X. and Ok, Y.S., 2022. Prediction of Soil Heavy Metal Immobilization by Biochar Using Machine Learning. Environmental Science & Technology, 56(7), pp.4187-4198. (IF: 11.357).

8. Zhang, M., Shen, J., Zhong, Y., Ding, T., Dissanayake, P.D., Yang, Y., Tsang, Y.F. and Ok, Y.S., 2022. Sorption of pharmaceuticals and personal care products (PPCPs) from water and wastewater by carbonaceous materials: a review. Critical Reviews in Environmental

Science and Technology, 52(5), pp.727-766. (IF: 11.750)

9. Thant, M., Lin, X., Atapattu, A.J. et al. 2022. Activity-density and spatial distribution of termites on a fine-scale in a tropical rainforest in Xishuangbanna, southwest China. Soil Ecol. Lett. https://doi.org/10.1007/s42832-022-0141-7

10. Mingke Fang, Anjana J. Atapattu, Luxiang Lin, Shangwen Xia & Xiaodong Yang. 2022 Soil Nutrient Concentrations, Associations and Their Relationships with Canopy Tree Category and Size in the Southwestern China Tropical Rainforests, Journal of Sustainable Forestry, doi: 10.1080/10549811.2022.2150219.

11. Wijayaraja, I., Piyarathne, M., Alahakoon, T., Devasinghe, U., Weerasinghe, L., Kumarathunge, D. P., Dissanayake, D., Egodawatta, C., Geekiyanage, N. 2022. Acclimation of Ecophysiological and Agronomic Traits to Increasing Growth Temperature in Three Cowpea Genotypes Grown in Anuradhapura, Sri Lanka. International Journal of Agronomy. Article ID 3596075.

12. Piyarathne, M., Wijayaraja, I., Devasinghe, D. A. U. D., Weerasinghe, L. K., Kumarathunge, D. P., Dissanayake, D. M. D., Malaviarachchi, M. A. P. W. K., Nalaka, G. D. A. 2022. Effect of Water Stress during Seed Production and Storage Time on Germination and Seedling Growth of Cowpea Grown in the Dry Zone of Sri Lanka. Tropical Agricultural Research. 33 (2). 200-212.

International Refereed Journals

1. Bandupriya, H.D.D., Perera, S.A.C.N., Ranasinghe, C.S., Yalegama, C., Hewapathirana, H.P.D.T 2022. Physiological, biochemical and molecular evaluation of micropropagated and seed-grown coconut (Cocos nucifera L.) palms. Trees 36, 127-138.

2. Gertrude Scynthya Nirukshan, Sanathanie Ranasinghe and Steven Sleute. 2022. The effect of biochar on mycorrhizal fungi mediated nutrient uptake by coconut (Cocos nucifera L.) seedlings grown on a Sandy Regosol. Biochar 4:68, https://doi.org/10.1007/s42773-022-00192-9.

3. Nuwarapaksha, T.D., Udumann, S.S., Dissanayaka, D.M.N.S., Dissanayake, D.K.R.P.L., Atapattu, A.J. 2022. Coconut Based Multiple Cropping Systems: An Analytical Review in Sri Lankan Coconut Cultivations. Circular Agricultural Systems 2:8 https://doi.org/10.48130/CAS-2022-0008

4. Dissanayaka D.M.N.S., Nuwarapaksha T.D., Udumann, S.S., Dissanayake, D.K.R.P.L., Atapattu AJ. 2022. A sustainable way of increasing productivity of coconut cultivation using cover crops: A review. Circular Agricultural Systems 2:7 doi: 10.48130/CAS-2022-0007

5. Suriyagoda, L.D.B., Dissanayake, O., Kodithuwakku, V., Maduwanthi, I., Dissanayaka, N. and Chandrajith, R. 2022. Accumulation of essential mineral and toxic trace elements in crops and soils of vegetable cropping systems in central highlands of Sri Lanka. The Journal of Agricultural Science, pp.1-12. https://doi.org/10.1017/S0021859622000156.

6. Hewa Pathirana, H. P. D. T., Wijesekara, I., Yalegama, L. L. W. C., Jayasinghe, M. A., & Waidyarathne, K. P. 2022. Comparison of blood glucose responses by cane sugar (Saccharum officinarum) versus coconut jaggery (Cocos nucifera) in type 2 diabetes patients. Journal of future foods 2-3 : pp 261-265.

7. Rushdha, S.A.F., Ulpathakumbura, B.S.K., Yalegama, C., Hewa Pathirana, H.P.D.T. Marikkar, J.M.N. 2022. Evaluation of Staple Foods Supplemented with Defatted Coconut Tests Flour.CORD 38:39-46

8. Yalegama, L.L.W.C., Karunarathne, D.N. and Sivakanesan, R. 2022. A study on acid hydrolysis and composition of polysaccharides concentrated from coconut kernel. CORD, 38, 33-41.

9. Gunarathne, R., Marikkar, N., Mendis, E., Yalegama, C., Jayasinghe, L. and Ulpathakumbura, S. 2022. Mid-IR spectral characterization & chemometric evaluation of different solvent extracts of coconut testa flour. Journal of Food Chemistry & Nanotechnology, 8(3), 69-75

10. Gunarathne, K.M.R.U., Marrikar, J.M.N., Mendis, E., Yalegama, C., Jayasinghe, U. L. B., Liyanage, R. and Jayaweera, S. (2022). Bioactivity studies of different solvent extracts of partially defatted coconut testa flour obtained from selected coconut cultivar. Journal of Agriculture Sciences- Sri Lanka. 17(1),171-184.

11. Gunarathne, R., Marikkar, N., Yalegama, C. Mendis, E. (2022). FTIR spectral analysis combined with chemometrics in evaluation of composite mixtures of coconut testa flour and wheat flour. Food Measure 16, 1796–1806. https://doi.org/10.1007/s11694-022-01287-4

Local Refereed Journals

1. Dilrukshi, K.B.M.T., Jayalath, K.V.N.N., Dissanayake S.N. and Perera, S.M.S.D. (2022). Retail price volatility: The case of coconut in Sri Lanka, Sri Lankan Journal of Agricultural Economics, 23 (1): 22-34.

2. Periyapperuma, P.M.M.J., Dissanayake, S.N. and Jayalath, K.V.N.N. (2022). Analysis of supply response of coconut cultivation in Sri Lanka. COCOS (forthcoming)

Proceedings of / Presentations at Symposia and Conferences

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ජාතික විගණන කාර්යාලය
தேசிய கணக்காய்வு அலுவலகம்
NATIONAL AUDIT OFFICE

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පොල් පර්යේෂණ මණ්ඩලය

පොල් පර්යේෂණ මණ්ඩලය **2022** දෙසැම්බර් **31** දිනෙන් අවසන් වර්ෂය සඳහා වූ මූල්‍ය ප්‍රකාශන සහ වෙනත් නෛතික හා නියාමන අවශ්‍යතා පිළිබඳව **2018** අංක **19** දරන ජාතික විගණන පනතේ **12** වන වගන්තිය ප්‍රකාරව විගණකාධිපති වාර්තාව

යථෝක්ත වාර්තාව මේ සමඟ ඉදිරිපත් කර ඇත.

ඩබ්ලිව්.පී.සී.වික්‍රමරත්න

විගණකාධිපති

පිටපත් : - (1) ලේකම් - මුදල්, ආර්ථික ස්ථායීකරණ සහ ජාතික ප්‍රතිපත්ති අමාත්‍යාංශය

(2) ලේකම් -වැවිලි කාර්මාන්ත අමාත්‍යාංශය

අංක 306/72, පොල්දූව පාර, බත්තරමුල්ල, ශ්‍රී ලංකාව
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தேசிய கணக்காய்வு அலுவலகம்
NATIONAL AUDIT OFFICE

මගේ අංකය எனது இல. My No. PAL/F/CRB/01/2022/09 ඔබේ අංකය உமது இல. Your No. දිනය திகதி Date 2023 ජූනි 27 දින

සභාපති
පොල් පර්යේෂණ මණ්ඩලය

පොල් පර්යේෂණ මණ්ඩලයේ 2022 දෙසැම්බර් 31 දිනෙන් අවසන් වර්ෂය සඳහා වූ මූල්‍ය ප්‍රකාශන සහ වෙනත් නෛතික හා නියාමන අවශ්‍යතා පිළිබඳව 2018 අංක 19 දරන ජාතික විගණන පනතේ 12 වන වගන්තිය ප්‍රකාරව විගණකාධිපති වාර්තාව

1. මූල්‍ය ප්‍රකාශන

1.1 තත්ත්වාගණනය කළ මතය

පොල් පර්යේෂණ මණ්ඩලයේ 2022 දෙසැම්බර් 31 දිනට මූල්‍ය තත්ත්ව ප්‍රකාශනය සහ එදිනෙන් අවසන් වර්ෂය සඳහා වූ මූල්‍ය කාර්යසාධන ප්‍රකාශනය, හිමිකම් වෙනස්වීමේ ප්‍රකාශනය සහ එදිනෙන් අවසන් වර්ෂය සඳහා මුදල් ප්‍රවාහ ප්‍රකාශනය සහ මූල්‍ය ප්‍රකාශන වලට අදාළ සටහන්, සාරාංශගත වැදගත් ගිණුම්කරණ ප්‍රතිපත්තිවලින් සමන්විත 2022 දෙසැම්බර් 31 දිනෙන් අවසන් වර්ෂය සඳහා වූ මූල්‍ය ප්‍රකාශන ශ්‍රී ලංකා ප්‍රජාතාන්ත්‍රික සමාජවාදී ජනරජයේ ආණ්ඩුක්‍රම ව්‍යවස්ථාවේ 154 (1) ව්‍යවස්ථාව සමඟ සංයෝජිතව කියවිය යුතු 1971 අංක 46 දරන පොල් සංවර්ධන පනතේ, 2018 අංක 19 දරන ජාතික විගණන පනතේ සහ 1971 අංක 38 දරන මුදල් පනතේ විධිවිධාන ප්‍රකාර මාගේ විධානය යටතේ විගණනය කරන ලදී. ආණ්ඩුක්‍රම ව්‍යවස්ථාවේ 154 (6) ව්‍යවස්ථාව ප්‍රකාරව මාගේ වාර්තාව යථා කාලයේදී පාර්ලිමේන්තුවේ සභාගත කරනු ලැබේ.

මාගේ වාර්තාවේ තත්ත්වාගණනය කළ මතය සඳහා පදනම කොටසේ විස්තර කර ඇති කරුණු වලින් වන බලපෑම හැර, මණ්ඩලයේ මූල්‍ය ප්‍රකාශන තුළින් 2022 දෙසැම්බර් 31 දිනට මූල්‍ය තත්ත්වය සහ එදිනෙන් අවසන් වර්ෂය සඳහා එහි මූල්‍ය ක්‍රියාකාරිත්වය හා මුදල් ප්‍රවාහ ශ්‍රී ලංකා රාජ්‍ය අංශයේ ගිණුම්කරණ ප්‍රමිතිවලට අනුකූලව සත්‍ය හා සාධාරණ තත්ත්වයක් පිළිබිඹු කරන බව මා දරන්නා වූ මතය වේ.

අංක 306/72, පොල්දූව පාර, බත්තරමුල්ල, ශ්‍රී ලංකාව இல. 306/72, பொல்துவ வீதி, பத்தரமுல்லை, இலங்கை. No. 306/72, Polduwa Road, Battaramulla, Sri Lanka.
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1.2 තත්ත්වාගණනය කළ මතය සඳහා පදනම

(අ) වැලිගම කොළ මැලවීමේ හා කුණුවීමේ රෝග මර්ධන ව්‍යාපෘතිය, කිණියම් දෙමුහුන් පොල් පැළ නිෂ්පාදන ව්‍යාපෘතිය, පොල් සැකසුම් අංශයේ දෙමහල් ගොඩනැගිල්ල ඉදිකිරීම් ව්‍යාපෘතිය යනාදි ව්‍යාපෘති සඳහා පොල්, කිතුල්,තල් ප්‍රවර්ධනය හා ආශ්‍රිත කාර්මික භාණ්ඩ අපනයන විවිධාංගීකරණ රාජ්‍ය අමාත්‍යාංශය හා අන්තර් ජාතික පොල් ප්‍රජාව වෙතින් ප්‍රදාන ලෙස රු.285,849,608ක් සමාලෝචිත වර්ෂය තුළදී ලැබී තිබුණද එයින් ආදායම් ලෙස ආදායම් කාර්ය සාධන ප්‍රකාශයට රු.94,355,348ක් පමණක් බැර කර තිබුණු අතර රු.191,494,260 ක වෙනස සදොස් ලෙස "ව්‍යාපෘති සඳහා ප්‍රාග්ධන දායකත්ව " නමින් ගිණුමකට ගලපා තිබුණි.

(ආ) පොල් පර්යේෂණ මණ්ඩලය විසින් 2017 වර්ෂයට පෙර සිට අවසන් කරන ලද ව්‍යාපෘති 17 ක් වෙනුවෙන් පෞද්ගලික ප්‍රදානකරුවන්ගෙන් හා පොල්, කිතුල්, තල් ප්‍රවර්ධනය හා ආශ්‍රිත කාර්මික භාණ්ඩ අපනයන විවිධාංගීකරණ රාජ්‍ය අමාත්‍යාංශයෙන් ලැබුණු මුදල්වලින් ඉතිරි වී ඇති රු.10,118,609 ක අක්මුදල් සමාලෝචිත වර්ෂය අවසානය දක්වා කිසිදු කාර්යයක යෙදවීමෙන් තොරව නිෂ්ක්‍රීයව පැවතුණි.

(ඇ) " සුදුමැස්සා " පළිබෝධ හානිය හඳුනා ගැනීම සඳහා පර්යේෂණ 3 ක් හා එම පළිබෝධ පාලනය පිළිබඳ පර්යේෂණ 6 ක් සිදුකර තිබුණ ද අනුමත පර්යේෂණ යෝජනා, පර්යේෂණ ප්‍රතිඵල ඇතුළු පර්යේෂණයට අදාළ වැදගත් ලිපිලේඛන අඩංගු ලිපිගොනු විගණනයට ඉදිරිපත් කර නොතිබුණි.

ශ්‍රී ලංකා විගණන ප්‍රමිතිවලට (ශ්‍රී.ලං.වි.ප්‍ර) අනුකූලව මා විගණනය සිදු කරන ලදී. මෙම විගණන ප්‍රමිති යටතේ වූ මාගේ වගකීම්, මෙම වාර්තාවේ මූල්‍ය ප්‍රකාශන විගණනය සම්බන්ධයෙන් විගණකගේ වගකීම් යන කොටසේ තවදුරටත් විස්තර කර ඇත. මාගේ තත්ත්වාගණනය කළ මතය සඳහා පදනමක් සැපයීම උදෙසා මා විසින් ලබාගෙන ඇති විගණන සාක්ෂි ප්‍රමාණවත් සහ උචිත බව මාගේ විශ්වාසයයි.

1.3 මණ්ඩලයේ 2022 වාර්ෂික වාර්තාවේ ඇතුළත් අනෙකුත් තොරතුරු.

මෙම විගණන වාර්තාවේ දිනට පෙර මා ලබාගත් මණ්ඩලයේ 2022 වාර්ෂික වාර්තාවේ ඇතුළත් කර ඇති නමුත් මූල්‍ය ප්‍රකාශන සහ ඒ පිළිබඳව වූ මගේ විගණන වාර්තාවේ ඇතුළත් නොවන තොරතුරු, අනෙකුත් තොරතුරු යන්නෙන් අදහස් වේ. මෙම අනෙකුත් තොරතුරු සඳහා කළමනාකරණය වගකිව යුතුය.

මූල්‍ය ප්‍රකාශන සම්බන්ධයෙන් වූ මගේ මතයෙන් අනෙකුත් තොරතුරු ආවරණය නොකරන අතර මම ඒ පිළිබඳ කිසිදු ආකාරයක සහතිකවීමක් හෝ මතයක් ප්‍රකාශ නොකරමි.

මූල්‍ය ප්‍රකාශන පිළිබඳ මගේ විගණනයට අදාළව, මගේ වගකීම වන්නේ ඉහත හඳුනාගත් අනෙකුත් තොරතුරු ලබා ගත හැකි වූ විට කියවීම සහ එසේ කිරීමේදී අනෙකුත් තොරතුරු මූල්‍ය ප්‍රකාශන සමඟ හෝ විගණනයේදී හෝ වෙනත් ආකාරයකින් ලබාගත් මගේ දැනුම අනුව ප්‍රමාණාත්මක වශයෙන් නොගැලපෙනවාද යන්න සලකා බැලීමයි.

මෙම විගණක වාර්තාවේ දිනට පෙර මා ලබාගත් අනෙකුත් තොරතුරු මත හා මා විසින් කරන ලද කාර්යයන් මත පදනම්ව, මෙම අනෙකුත් තොරතුරු ප්‍රමාණාත්මක වශයෙන් වැරදි ලෙස දක්වා ඇති බව මම නිගමනය කරන්නේ නම්, එම කරුණ මා විසින් වාර්තා කිරීමට අවශ්‍ය වේ. මේ සම්බන්ධයෙන් මට වාර්තා කිරීමට කිසිවක් නැත.

1.4 මූල්‍ය ප්‍රකාශන පිළිබඳ කළමනාකරණයේ සහ පාලනය කරන පාර්ශවයන්ගේ වගකීම

මෙම මූල්‍ය ප්‍රකාශන ශ්‍රී ලංකා රාජ්‍ය අංශයේ ගිණුම්කරණ ප්‍රමිතිවලට අනුකූලව පිළියෙල කිරීම හා සාධාරණ ලෙස ඉදිරිපත් කිරීම සහ වංචා හෝ වැරදි හේතුවෙන් ඇතිවිය හැකි ප්‍රමාණාත්මක සාවද්‍ය ප්‍රකාශයන්ගෙන් තොරව මූල්‍ය ප්‍රකාශන පිළියෙල කිරීමට හැකිවනු පිණිස අවශ්‍යවන අභ්‍යන්තර පාලනයන් තීරණය කිරීම කළමනාකරණයේ වගකීම වේ.

මූල්‍ය ප්‍රකාශන පිළියෙල කිරීමේදී, මණ්ඩලය අඛණ්ඩව පවත්වාගෙන යාමේ හැකියාව තීරණය කිරීම කළමනාකරණයේ වගකීමක් වන අතර, කළමනාකාරිත්වය මණ්ඩලය ඈවර කිරීමට අදහස් කරන්නේ නම් හෝ වෙනත් විකල්පයක් නොමැති විටදී මෙහෙයුම් නැවැත්වීමට කටයුතු කරන්නේ නම් හැර අඛණ්ඩ පැවැත්මේ පදනම මත ගිණුම් තැබීම හා මණ්ඩලයේ අඛණ්ඩ පැවැත්මට අදාළ කරුණු අනාවරණය කිරීමද කළමනාකරණයේ වගකීමකි.

මණ්ඩලයේ මූල්‍ය වාර්තාකරණ ක්‍රියාවලිය සම්බන්ධව පරීක්ෂා කිරීමේ වගකීම, පාලනය කරන පාර්ශවයන් විසින් දරනු ලබයි.

2018 අංක 19 දරන ජාතික විගණන පනතේ 16 (1) උප වගන්තිය ප්‍රකාරව, මණ්ඩලයේ වාර්ෂික සහ කාලීන මූල්‍ය ප්‍රකාශන පිළියෙල කිරීමට හැකිවන පරිදි ස්වකීය ආදායම්, වියදම්, වත්කම් හා බැරකම් පිළිබඳ නිසි පරිදි පොත්පත් හා වාර්තා පවත්වාගෙන යා යුතුය.

1.5 මූල්‍ය ප්‍රකාශන විගණනය සම්බන්ධයෙන් විගණකගේ වගකීම

සමස්තයක් ලෙස මූල්‍ය ප්‍රකාශන, වංචා සහ වැරදි නිසා ඇතිවන ප්‍රමාණාත්මක සාවද්‍ය ප්‍රකාශනයන්ගෙන් තොර බවට සාධාරණ තහවුරුවක් ලබාදීම සහ මාගේ මතය ඇතුළත් විගණන වාර්තාව නිකුත් කිරීම මාගේ අරමුණ වේ. සාධාරණ සහතිකවීම උසස් මට්ටමේ සහතිකවීමක් වන නමුත්, ශ්‍රී ලංකා විගණන ප්‍රමිති ප්‍රකාරව විගණනය සිදු කිරීමේදී එය සැමවිටම ප්‍රමාණාත්මක සාවද්‍ය ප්‍රකාශනයන් අනාවරණය කරගන්නා බවට වන තහවුරු කිරීමක් නොවනු ඇත. වංචා සහ වැරදි තනි හෝ සාමූහික ලෙස බලපෑම නිසා ප්‍රමාණාත්මක සාවද්‍ය ප්‍රකාශනයන් ඇතිවිය හැකි අතර, එහි ප්‍රමාණාත්මක භාවය මෙම මූල්‍ය ප්‍රකාශන පදනම් කරගනිමින් පරිශීලකයන් විසින් ගනු ලබන ආර්ථික තීරණ කෙරෙහි වන බලපෑම මත රඳා පවතී.

ශ්‍රී ලංකා විගණන ප්‍රමිති ප්‍රකාරව විගණනයේ කොටසක් ලෙස මා විසින් විගණනයේදී වෘත්තීය විනිශ්චය සහ වෘත්තීය සැකමුසුබවින් යුතුව ක්‍රියාකරන ලදී. මා විසින් තවදුරටත්,

- ප්‍රකාශ කරන ලද විගණන මතයට පදනමක් සපයා ගැනීමේදී වංචා හෝ වැරදි හේතුවෙන් මූල්‍ය ප්‍රකාශනවල ඇතිවිය හැකි ප්‍රමාණාත්මක සාවද්‍ය ප්‍රකාශනයන් ඇතිවීමේ අවදානම් හඳුනාගැනීම් හා තක්සේරු කිරීම් සඳහා අවස්ථාවෝචිතව උචිත විගණන පරිපාටි සැලැසුම්කර ක්‍රියාත්මක කරන ලදී. වරදවා දැක්වීම් හේතුවෙන් සිදුවන ප්‍රමාණාත්මක සාවද්‍ය ප්‍රකාශයන්ගෙන් සිදුවන බලපෑමට වඩා වංචාවකින් සිදුවන්නා වූ බලපෑම් ප්‍රබල වන්නේ ඒවා දුස්සන්ධානයෙන්, ව්‍යාජ ලේඛන සැකසීමෙන්, චේතනාන්විත මහහැරීමෙන්, වරදවා දැක්වීමෙන් හෝ අභ්‍යන්තර පාලනයන් මහහැරීමෙන් වැනි හේතු නිසා වන බැවිනි.
- අභ්‍යන්තර පාලනයේ සඵලදායිත්වය පිළිබඳව මතයක් ප්‍රකාශ කිරීමේ අදහසින් නොවුවද, අවස්ථාවෝචිතව උචිත විගණන පරිපාටි සැලසුම් කිරීම පිණිස අභ්‍යන්තර පාලනය පිළිබඳව අවබෝධයක් ලබා ගන්නා ලදී.
- භාවිතා කරන ලද ගිණුම්කරණ ප්‍රතිපත්තිවල උචිතභාවය, ගිණුම්කරණ ඇස්තමේන්තුවල සාධාරණත්වය සහ කළමනාකරණය විසින් කරන ලද සම්බන්ධිත හෙළිදරව් කිරීම් අගයන ලදී.
- සිද්ධීන් හෝ තත්ත්වයන් හේතුවෙන් මණ්ඩලයේ අඛණ්ඩ පැවැත්ම පිළිබඳ ප්‍රමාණාත්මක අවිනිශ්චිතතාවයක් නිබෙද යන්න සම්බන්ධයෙන් ලබාගත් විගණන සාක්ෂි මත පදනම්ව ගිණුම්කරණය සඳහා ආයතනයේ අඛණ්ඩ පැවැත්ම පිළිබඳ පදනම යොදා ගැනීමේ අදාලත්වය තීරණය කරන ලදී. ප්‍රමාණවත් අවිනිශ්චිතතාවයක් ඇති බවට මා නිගමනය කරන්නේ නම් මූල්‍ය ප්‍රකාශනවල ඒ සම්බන්ධයෙන් වූ හෙළිදරව්කිරීම් වලට මාගේ විගණන වාර්තාවේ අවධානය යොමු කළ යුතු අතර, එම හෙළිදරව්කිරීම් ප්‍රමාණවත් නොවන්නේ නම් මාගේ මතය විකරණය කළ යුතුය. කෙසේ වුවද, අනාගත සිද්ධීන් හෝ තත්ත්වයන් මත අඛණ්ඩ පැවැත්ම අවසන් වීමට හැකිය.

- මූල්‍ය ප්‍රකාශනවල ව්‍යුහය හා අන්තර්ගතය සඳහා පාදක වූ ගනුදෙනු හා සිද්ධීන් උචිත හා සාධාරණව ඇතුළත් වී ඇති බව සහ හෙළිදරව් කිරීම් ඇතුළත් මූල්‍ය ප්‍රකාශනවල සමස්ත ඉදිරිපත් කිරීම අගයන ලදී.

මාගේ විගණනය තුළදී හඳුනාගත් වැදගත් විගණන සොයාගැනීම්, ප්‍රධාන අභ්‍යන්තර පාලන දුර්වලතා හා අනෙකුත් කරුණු පිළිබඳව පාලනය කරනු ලබන පාර්ශවයන් දැනුවත් කරමි.

2. වෙනත් නෛතික හා නියාමන අවශ්‍යතා පිළිබඳ වාර්තාව

2.1 2018 අංක 19 දරන ජාතික විගණන පනතේ පහත සඳහන් අවශ්‍යතාවයන් සම්බන්ධයෙන් විශේෂ ප්‍රතිපාදන ඇතුළත් වේ.

2.1.1 මාගේ වාර්තාවේ නත්ත්වාගණනය කළ මතය සඳහා පදනම කොටසේ විස්තර කර ඇති කරුණු වලින් වන බලපෑම හැර, 2018 අංක 19 දරන ජාතික විගණන පනතේ 12 (අ) වගන්තියේ සඳහන් අවශ්‍යතාවන් අනුව, විගණනය සඳහා අවශ්‍ය සියලු තොරතුරු සහ පැහැදිලි කිරීම් මා විසින් ලබාගන්නා ලද අතර, මාගේ පරීක්ෂණයෙන් පෙනී යන ආකාරයට නිසි මූල්‍ය වාර්තා මණ්ඩලය පවත්වාගෙන ගොස් තිබුණි.

2.1.2 2018 අංක 19 දරන ජාතික විගණන පනතේ 6 (1) (ඇ) (iii) වගන්තියේ සඳහන් අවශ්‍යතාවය අනුව මණ්ඩලයේ මූල්‍ය ප්‍රකාශන ඉකුත් වර්ෂය සමඟ අනුරූප වේ.

2.1.3 2018 අංක 19 දරණ ජාතික විගණන පනතේ 6 (1) (ඇ) (iv) වගන්තියේ සඳහන් අවශ්‍යතාවය අනුව මාගේ වාර්තාවේ නත්ත්වාගණනය කළ මතය සඳහා පදනම කොටසේ 1.2 (අ) හි දක්වා ඇති නිරීක්ෂණ හැර ඉකුත් වර්ෂයේදී මා විසින් සිදුකරන ලද නිර්දේශයන් ඉදිරිපත් කරන ලද මූල්‍ය ප්‍රකාශනවල ඇතුළත්ව ඇත.

2.2 අනුගමනය කරන ලද ක්‍රියාමාර්ග සහ ලබා ගන්නා ලද සාක්ෂි මත හා ප්‍රමාණාත්මක කරුණුවලට සීමා කිරීම් තුල, පහත සඳහන් ප්‍රකාශ කිරීමට තරම් කිසිවක් මාගේ අවධානයට ලක් නොවීය.

2.2.1 2018 අංක 19 දරන ජාතික විගණන පනතේ 12 (ඇ) වගන්තියේ සඳහන් අවශ්‍යතාවය අනුව මණ්ඩලයේ පාලක මණ්ඩලයේ යම් සාමාජිකයෙකුට මණ්ඩලය සම්බන්ධ වී යම් ගිවිසුමක් සම්බන්ධයෙන් සෘජුව හෝ අන්‍යාකාරයකින් සාමාන්‍ය ව්‍යාපාරික නත්වයෙන් බැහැරව සම්බන්ධයක් ඇති බව.

2.2.2 2018 අංක 19 දරන ජාතික විගණන පනතේ 12 (ඊ) වගන්තියේ සඳහන් අවශ්‍යතාවය අනුව පහත සඳහන් නිරීක්ෂණ හැර යම් අදාළ යම් ලිඛිත නීතියකට හෝ මණ්ඩලයේ පාලක මණ්ඩලය විසින් නිකුත් කරන ලද වෙනත් පොදු හෝ විශේෂ විධානවලට අනුකූල නොවන ලෙස ක්‍රියා කර ඇති බව.

	නීතිරීති / විධානයට යොමුව	නිරීක්ෂණ
(අ)	(i) xix පරිච්ඡේදයේ 5.3 ඡේදය	රජයේ නිල නිවාස සඳහා කුලිය විවාහක නිලධාරියෙකුගේ වැටුපෙන් සියයට 10ක් හා අවිවාහක නිලධාරියෙකුගේ වැටුපෙන් සියයට 5ක ප්‍රමාණයක් වුවද මණ්ඩලයේ කාර්ය මණ්ඩලයේ 21 දෙනෙකු විසින් භාවිතා කරන නිල නිවාස සඳහා කිසිදු කුලියක් අයකර නොතිබුණු අතර නිලධාරීන් හා සේවකයන් 59 දෙනෙකුගෙන් මාසිකව අයකළ කුලිය රු.50ත් රු.160ත් අතර ප්‍රමාණයක් විය.
	(ii) xix පරිච්ඡේදයේ 5.8 ඡේදය	(i) නිල නිවාසවල ජල බිල්පත් අදාළ නිලධාරියා විසින් ගෙවිය යුතු වුවද. මණ්ඩලයේ නිල නිවාසවල පදිංචිකරුවන් විසින් ඔවුන් පෞද්ගලිකව සිදු කරනු ලබන ජල පරිභෝජනය හා මණ්ඩලයේ ජල පරිභෝජනය ඇතුළත්ව සමාලෝචිත වර්ෂයේදී රු.3,115,592 ක් මණ්ඩලය විසින් ගෙවීම් කර තිබුණි.
		(ii) නිල නිවාසවල විදුලි බිල්පත් අදාළ නිලධාරියා ගෙවිය යුතු වුවද නිලධාරීන් අයත්වන ශ්‍රේණි අනුව විදුලි ගාස්තු ඒකක 56.25 සිට ඒකක 150 දක්වා ගාස්තු ගෙවීමෙන් නිදහස් කර තිබුණු අතර නිලධාරීන් 29ක් සඳහා සම්පූර්ණ විදුලි බිලම නිලධාරීන්ගෙන් නිදහස් කර මණ්ඩලය විසින් ගෙවීම් කර තිබුණි. ඒ අනුව සමාලෝචිත වර්ෂයේ ජනවාරි සිට නොවැම්බර් දක්වා නිලධාරීන්ගේ පෞද්ගලික

		විදුලි බිලෙන් රු.1,740,200ක් මණ්ඩලය විසින් දරා තිබුණි.
(ආ)	2022 ජනවාරි 20 දිනැති ජාතික පශු සම්පත් සංවර්ධන මණ්ඩලයේ අංක 04/2022 දරන වක්‍රලේඛය	2022 දෙසැම්බර් 31 දිනට මූල්‍ය තත්ත්ව ප්‍රකාශනයේ දක්වා ඇති රු.24,736,650ක ගවයන්, බැටළුවන් වැනි ජීව විද්‍යාත්මක වත්කම් තක්සේරු කිරීමේදී යොමුගත වක්‍රලේඛය ප්‍රකාරව එම සතුන්ගේ ගර්භනීභාවය, දිනකට නිෂ්පාදනය කරන සාමාන්‍ය කිරි ප්‍රමාණය පදනම් කරගෙන ඒවාට අදාළ රේටයන් යොදාගත යුතු වුවත් ඒ සඳහා සතුන්ගේ බර පමණක් සැලකිල්ලට ගෙන තිබුණි. එම නිසා ජීව විද්‍යාත්මක වත්කම්වල වටිනාකම අවතක්සේරු වී තිබුණි.

2.2.3 2018 අංක 19 දරන ජාතික විගණන පනතේ 12 (උ) වගන්තියේ සඳහන් අවශ්‍යතාවය අනුව මණ්ඩලයේ බලතල , කර්තව්‍ය සහ කාර්යයන්ට අනුකූල නොවන ලෙස කටයුතු කර ඇති බව.

2.2.4 2018 අංක 19 දරන ජාතික විගණන පනතේ 12 (ඌ) වගන්තියේ සඳහන් අවශ්‍යතාවය අනුව පහත සඳහන් නිරීක්ෂණය හැර මණ්ඩලයේ සම්පත් සකසුරුවම් ලෙස, කාර්යක්ෂම ලෙස සහ ඵලදායී ලෙස කාලසීමාවන් තුළ අදාළ නිතිරීති වලට අනුකූලව ප්‍රසම්පාදනය කර භාවිතා කර නොමැති බව

ප්‍රභාසංශ්ලේෂණය මැනීම, ශාක පත්‍රවල උෂ්ණත්වය මැනීම හා පුටිකාවල හැසිරීම මැනීම සඳහා 2021 වර්ෂයේදී මණ්ඩලය විසින් මිලදී ගත් රු.16,934,095ක් පිරිවැය වූ ප්‍රභාසංශ්ලේෂණය මැනුම් උපකරණයේ (Photosynthesis meter) මැනුම් ඒකකයේ (Flow meter) දෝෂයක් මත එය මිලදීගෙන වර්ෂයක පමණ කාලයක් තුළ වාර 3කදී අලුත්වැඩියාකර තිබුණු අතර තුන්වන වාරයේදී මැනුම් ඒකකයේ දෝෂය අලුත්වැඩියා කිරීමට මණ්ඩලය රු.704,557ක මුදලක් (ඩොලර් 1945) දේශීය නියෝජිත ආයතනයට ගෙවීමට ප්‍රසම්පාදන කමිටුව අනුමත කර ගෙවීමට නියමිතව පවතී . මෙම උපකරණය මිලදී ගැනීමේ පූර්ව ප්‍රසම්පාදන අවස්ථාවේදී මේ හා සමාන උපකරණයක් භාවිතා කරන අග්නි දිග විශ්ව විද්‍යාලයෙන් තොරතුරු විමසීමේදී මෙම උපකරණය නිතරම අලුත්වැඩියා කිරීමට සිදුවන බවත් එම නිසා වගකීම් කාලය වර්ෂ 5 දක්වා වැඩිකර ගන්නා ලෙසත් එම විශ්ව විද්‍යාලයේ තාක්ෂණ පීඨයේ ජ්‍යෙෂ්ඨ කථිකාචාර්යවරයෙකු දන්වා තිබුණද මණ්ඩලය විසින් වගකීම් කාලය වැඩි කර ගැනීමට කටයුතු නොකර එක් අවුරුදු වගකීම් කාලයක් සහිතව යන්ත්‍රය මිලදීගෙන

නිබුණි. එසේම මෙම උපකරණය මිලදී ගැනීමේ නාක්ෂණ කමිටු සාමාජිකයකු හා ශාක කායික විද්‍යා අංශයේ පර්යේෂණ කටයුතු සිදුකළ ජ්‍යෙෂ්ඨ පර්යේෂණ නිලධාරියා 2022 වර්ෂයේදී මණ්ඩලයේ සේවය අතහැර ගොස් නිබුණි. එම නිසා මෙම යන්ත්‍රයෙන් උපරිම ප්‍රයෝජනයක් නොගන්නා බව නිරීක්ෂණය විය.

2.3 වෙනත් කරුණු

(අ) මණ්ඩලයේ කාර්යයන් අතර ප්‍රධානතම කාර්යයක් වන පොල් වගාව පිළිබඳ වැඩිදුර විද්‍යාත්මක පර්යේෂණ පැවැත්වීම, රෝග සහ පළිබෝධ වැලැක්වීම හා සුව කිරීම වුවද, 2019 වර්ෂයේ අගභාගයේදී ඇතිවූ "සුදුමැස්සා" පළිබෝධකයා පාලනය කිරීම සඳහා 2022 වර්ෂය දක්වා ස්ථිර ප්‍රතිකර්මයක් සොයාගෙන නොතිබුණු බැවින් දිස්ත්‍රික්ක 9 කට අයත් ප්‍රාදේශීය ලේකම් කොට්ඨාශ 127න් 50ක මෙම පළිබෝධකයා වගාවන් සඳහා දැඩිව බලපෑම් කිරීමෙන් පසුව කොහොඹ තෙල්, සබන් කුඩු මිශ්‍රණයක් 2022 අගභාගය වන විට හඳුනාගෙන තිබුණි.

(ආ) මණ්ඩලය විසින් " සුදුමැස්සා " මර්ධනය කිරීම සඳහා පොල් වගාකිරීමේ මණ්ඩලය සමඟ ප්‍රාදේශීය ලේකම් කොට්ඨාශ 3ක පමණක් පොල් ගස් 81,176 ක මර්ධන ව්‍යාපෘති ක්‍රියාත්මක කර පළිබෝධකයා පාලනය කිරීමට පියවර ගෙන තිබුණ ද මෙම රෝගය පැතිරී නිබෙන බව වාර්තා වී ඇති ඉතිරි ප්‍රාදේශීය ලේකම් කාර්යාල 124 හි මෙම පළිබෝධකයා මර්ධනය කිරීමට හා පාලනය කිරීමට නොහැකි වී තිබුණි.

(ඇ) පොල් ගස්වල කොළ මැලවීම හා කුණුවීමේ රෝගය පාලනය කිරීම සඳහා හඳුනා ගෙන තිබුණු එකම ක්‍රමවේදය රෝගී ගස් ගලවා ඉවත් කිරීම වුවද රෝගය පවතින ගාල්ල, මාතර, හම්බන්තොට දිස්ත්‍රික්ක තුනෙහි 2022 වර්ෂයේ සලකුණු කළ ගස් 3,263න් ඉවත් නොකළ ගස් 1,469ක් පැවතීම රෝග මැඩලීමට බාධාවක් හා රෝග වර්ධනය වීමට හේතුවක් වී තිබුණු බව විගණනයේදී නිරීක්ෂණය විය.

(ඈ) මණ්ඩලය විසින් දකුණු පළාතේ ග්‍රාම නිලධාරී වසම් 294කට අදාළව පොල්කොළ මැලවීමේ හා කොළ කුණුවීමේ රෝගය පිළිබඳ පරීක්ෂාව 2008 වර්ෂයේ සිට අදියර 5කින් ආරම්භකර වසර 14ක කාලයක් ගත වුවද පරීක්ෂා කළ යුතු ග්‍රාම නිලධාරී වසම් 114 ක පරීක්ෂා කිරීම කටයුතු නිමකර නොතිබුණි. එසේම රෝග පාලනය සඳහා "රෝගී කලාපය තුළ රෝග ලක්ෂණ පෙන්වන සියලුම පොල් ගස් හා පැළ කපා ඉවත් කිරීම " සිදුවන අතර 2013 වර්ෂයේ සිට 2022 වර්ෂය දක්වා ප්‍රතිරෝධී දෙමුහුන් පැළ 3,193ක් වැනි සුළු සංඛ්‍යාවක් පමණක් හඳුන්වා දී තිබුණි. රසායනික ද්‍රව්‍ය භාවිතය සම්බන්ධයෙන් පර්යේෂණ සිදු කරමින් පැවතියද සමාලෝචිත වර්ෂය අවසානය දක්වා අදාළ පර්යේෂණ නිමකර නොතිබුණි.

(ඉ) මණ්ඩලය විසින් 2008 වර්ෂයේ සිට 2022 වර්ෂය දක්වා කාලය තුළ දකුණු පළාතේ පොල් කොළ කුණුවීමේ හා කොළ මැලවීමේ රෝග පරීක්ෂා කිරීම සඳහා නාවකාලික ක්ෂේත්‍ර පරීක්ෂක නිලධාරීන් 04 ත් 24 ත් අතර ප්‍රමාණයක් සේවයට බඳවාගෙන සේවා ඛණ්ඩනයකට යටත්ව මාස 06 න් 06ට සේවා දිගුවන් ලබා දී තිබුණු අතර එම ප්‍රමාණය දිස්ත්‍රික්ක 03 ක ග්‍රාම නිලධාරී වසම් 294 ක් ආවරණය කිරීමට ප්‍රමාණවත් නොවන බව විගණනයේදී නිරීක්ෂණය විය.

(ඊ) පොල් කොළ මැලවීමේ හා කොළ කුණුවීමේ රෝගයට පොල් ගස් එන්නත් කිරීම හෝ ගස් කපා ඉවත් කිරීම හැර එම රෝගයට ඔරෝත්තු දෙන ප්‍රතිරෝධී පැළ නිෂ්පාදනයට වැඩි අවධානයක් යොමුකළ යුතු නමුත් අදාළ අත්පරාගන වැඩසටහන ක්‍රියාත්මක කරන සේවකයා 2020 ඔක්තෝම්බර් මස සිට කොන්ත්‍රාත් කාලය අවසන් වීම මත ප්‍රතිරෝධී පැළ නිෂ්පාදනයද නතර වී තිබුණි.

(උ) පොල් වගාකිරීමේ මණ්ඩලය සතු වැලිගම පිහිටි අක්කර 15ක භූමිය 2016 දෙසැම්බර් 20 දින සිට අවබෝධතා ගිවිසුමක් මත අවුරුදු 10ක කාලසීමාවක් සඳහා මණ්ඩලය වෙත ලබාගෙන තිබුණු අතර වැලිගම පොල්කොළ මැලවීමේ හා කොළ කුණුවීමේ රෝගයට ඔරොත්තු දෙන ප්‍රතිරෝධී නව දෙමුහුන් පැළ තවානක් බවට මෙම භූමිය පුළුල් කිරීම එහි අරමුණ වුවද 2013 සිට 2022 දක්වා වසර 09ක කාලය එහි පැළ 3,193ක් පමණක් නිෂ්පාදනය කර වගාකරුවන්ට හා පොල් වගාකිරීමේ මණ්ඩලයට බෙදාදී තිබුණි.

(ඌ) පොල් පර්යේෂණ මණ්ඩලයේ සේවය කරමින් සිටියදී අධ්‍යයන නිවාඩු ලබා විදේශ ගතවූ නිලධාරීන් 06 දෙනෙකු විසින් මණ්ඩලය සමඟ ඇති කරගත් සේවා ගිවිසුම් උල්ලංඝනය කරමින් මණ්ඩලයේ සේවයට වාර්තා නොකිරීම හේතුවෙන් මණ්ඩලයට අයවිය යුතු රු.13,582,035 ක් සමාලෝචිත වර්ෂය අවසානය දක්වා අයකර ගෙන නොතිබුණි.

(එ) මණ්ඩලයේ අධ්‍යයන නිවාඩු ලබාගත් පර්යේෂණ නිලධාරීන් තිදෙනෙකු ගිවිසුම් ප්‍රකාරව අධ්‍යයන නිවාඩු අවසන්කර සේවයට වාර්තාකර තිබුණ ද වසර 3 – 4 ක සේවයෙන් පසු ඔවුන් විසින් සේවය කළ යුතු අනිවාර්ය සේවා කාලය ඉක්මවායාමට පෙර මණ්ඩලයේ සේවය හැරගොස් තිබුණු නමුත් මණ්ඩලයට අයවිය යුතු රු. 36,657,735 ක බැඳුම්කර වටිනාකම අයකර ගෙන නොතිබුණි.

(ඒ) සමාලෝචිත වර්ෂය අවසානය වන විට මණ්ඩලයේ පර්යේෂණ අංශ 8 තුළ කෘෂි ආර්ථික අංශයේ හා ශාක කායික විද්‍යා අංශයේ එක් පර්යේෂණ නිලධාරියෙකු බැගින්ද අනිකුත් අංශවල පර්යේෂණ නිලධාරීන් 2 - 4 අතර ප්‍රමාණයක් පමණක් සිටින අතර අංශ ප්‍රධානීන් 5ක්ද, ප්‍රධාන පර්යේෂණ නිලධාරීන් 3ක් ද, ජ්‍යෙෂ්ඨ පර්යේෂණ නිලධාරීන් 7ක් ද පර්යේෂණ නිලධාරීන් 1ක්ද පුරප්පාඩුව පැවතුණි. ආයතනයේ අරමුණු ළඟාකර ගැනීමට පර්යේෂණ කටයුතු සඳහා ප්‍රමාණවත් නිලධාරීන් සංඛ්‍යාවක් නොමැති බව විගණනයේදී නිරීක්ෂණය විය.

(ඔ) මණ්ඩලයේ ශාක කායික විද්‍යා අංශයේ ජ්‍යෙෂ්ඨ පර්යේෂණ නිලධාරියෙකු විසින් "ගෝලීය උෂ්ණත්වය ඉහළ යාමේ සහ නියහයේ බලපෑම ශ්‍රී ලංකාවේ පොල් කර්මාන්තයට බලපාන අයුරු තක්සේරු කිරීම" නැමති ශීර්ෂය යටතේ පර්යේෂණයක් සිදුකිරීමට 2021 දෙසැම්බර් 28 බණ්ඩිරිප්පුව පර්යේෂණ මධ්‍යස්ථානයේ අෂ්ඨාකාර ගැල්වනයිස් පර්යේෂණ කූටි 12ක් වෙනුවෙන් රු.1,098,000ක් වියදම් කර සවිකර තිබුණි. මූලික කාර්යයන් ආරම්භ කිරීමෙන් පසු පර්යේෂණය ආරම්භ කළ නිලධාරියා 2022 පෙබරවාරි 28 දින මණ්ඩලයේ සේවය හැරගොස් තිබුණු බැවින් හා වෙනත් නිලධාරියෙකුට එම පර්යේෂණයන් සඳහා අවශ්‍ය දැනුම නොතිබුණු බැවින් පර්යේෂණය අතරමඟ නතර වී තිබුණු අතර සකස් කරන ලද කූටි 12 බණ්ඩිරිප්පු වන්තේ වල් බිහි වෙමින් පැවතුණු බැවින් එම මුදල් අනාර්ථික වියදමක් ලෙස විගණනයේදී නිරීක්ෂණය විය.

(ඕ) 2012 වර්ෂයේ සිට 2022 වර්ෂය දක්වා වූ කාලපරිච්ඡේදය තුළ මණ්ඩලයේ අංශ 7ක සිදුකරමින් පැවතුන පර්යේෂණයන් 14ක් පර්යේෂණ නිලධාරියා සේවය අතහැර යාම, මූල්‍ය ප්‍රතිපාදන නොමැති වීම, වල් අලින්ගෙන් හානි සිදුවීම, බලශක්ති නිෂ්පාදනය සඳහා ගිලිරිසිඩියා දඬු ඉල්ලුම් අඩුවීම හා ගිලිරිසිඩියා වගාකිරීම අඩුවීම ආදී හේතූන් මත සමාලෝචිත වර්ෂය අවසානය වන විට අතහැර දමා තිබුණු බැවින් ඒ සඳහා වැයකර තිබුණු රු.11,375,320ක් අනාර්ථික වියදම් ලෙස විගණනයේදී නිරීක්ෂණය විය.

(ක) කුරුණෑගල වැවිලි සමාගමට අයත් කුරුණෑගල කාල්ස් ෆිල්ඩ වතු යායෙන් අක්කර 75ක භූමිභාගය තුළ දෙමුහුන් බීජ පොල් උයනක් ස්ථාපිත කිරීම සඳහා පොල් පර්යේෂණ මණ්ඩලය සහ කුරුණෑගල වැවිලි සමාගම අතර 2021 සැප්තැම්බර් 29 දින 2021 - 2023 කාලපරිච්ඡේදය සඳහා අවබෝධතා ගිවිසුමකට එළඹී තිබුණි. දෙපාර්ශවය එළඹී ගිවිසුමට අනුව 2022 වර්ෂයේ ද ශ්‍රී ලංකා උස පොල් හා ශ්‍රී ලංකා දුඹුරු කුන්දිරා පොල් වර්ගයට අයත් ශාක භාවිතා කර දෙමුහුන් පොල් බීජ පැළ 2,150ක් නිෂ්පාදනය කළ යුතු වුවද විගණිත දිනය වූ 2023 අප්‍රේල් 26 වන විටත් ශ්‍රී ලංකා උස පොල් පැල 1,247ක් පමණක් බීජ පොල් උයනේ සිටුවා තිබුණි. ශ්‍රී ලංකා දුඹුරු කුන්දිරා පැළ සිටුවා නොතිබුණු අතර මණ්ඩලය විසින් කිසිදු දුඹුරු කුන්දිරා පැළයක් කුරුණෑගල වැවිලි සමාගම වෙත ලබා දී නොතිබුණි.

(ග) ඉහත (ක) ඡේදයේ දැක්වෙන බීජ පොල් උයන සඳහා ජලය සැපයීමට ජලනල ව්‍යාපෘතියක් ආරම්භ කිරීමට 2022 පෙබරවාරි 7 දින ඇස්තමේන්තුගත මුළු වටිනාකම වන රු.10,986,882 ක මුදල් අත්තිකාරම් ලෙස කුරුණෑගල වැවිලි සමාගමට ලබා දී තිබුණි. ජලනල ව්‍යාපෘතිය 2022 ඔක්තෝම්බර් මාසයේදී එනම් අත්තිකාරම් ලබා දී මාස 08කට පසු ආරම්භ කර තිබුණු අතර විගණිත දිනය වූ 2023 අප්‍රේල් 26 දින වන විටත් වසරකට වැඩි කාලයක් ගත වුවද ව්‍යාපෘතියේ කාර්යයන් පිළිබඳ නිසි අයිත්ෂණයක් සිදුකර නොතිබුණු බැවින් සැලකිය යුතු ප්‍රගතියක් ලබාගෙන නොතිබුණි. එසේම එම වතුයායේ වැට ගැසීමටද මණ්ඩලය විසින් රු.4,688,000ක් වියදම් කර තිබුණු අතර පොල්

පර්යේෂණ මණ්ඩලය සතුව ජාන සම්පත් මධ්‍යස්ථාන 10 ක් පැවතුණද මෙම ජාන සම්පත් මධ්‍යස්ථානවල මෙම කාර්යය සිදු කිරීමට ඇති හැකියාව ද සලකා බලා නොතිබුණු බව විගණනයේදී නිරීක්ෂණය විය.

(ව) මණ්ඩලයේ ප්‍රධාන අරමුණ දේශීය පොල් නිෂ්පාදනය වැඩි දියුණු කිරීම හා ඒ සඳහා පර්යේෂණ සිදුකිරීම වුවද 2019 හා 2021 වර්ෂවලදී අවස්ථා 02කදී මුදල් අර්බුධ හේතුවෙන් පර්යේෂණ නවතා තිබුණු අතර 2022 අගෝස්තු 25 දිනැති අංක 117/2022 දරන අධ්‍යක්ෂක මණ්ඩල තීරණය මත රු.202,800,000ක් ලංකා බැංකුව දංකොටුව ශාඛාවේ ඉතුරුම් ගිණුමක තැන්පත් කර තිබුණු බව විගණනයේදී නිරීක්ෂණය විය.

(ඡ) 2021 හා 2022 වර්ෂයන් තුළදී කිණියම දෙමුහුන් පොල් පැළ නිෂ්පාදන ව්‍යාපෘතියට අදාළව හලාවත වැවිලි සමාගම වෙත අවස්ථා හතරකදී රු.3,781,530 ක අත්තිකාරම් සහ කුරුණෑගල කාල්ස් ෆිල්ඩ් වතු යායේ කප්සුවය බීජ නිෂ්පාදන ව්‍යාපෘතියට අදාළව කුරුණෑගල වැවිලි සමාගම වෙත අවස්ථා 05කදී රු.16,631,962ක අත්තිකාරම්ද ලබා දී තිබුණු නමුත් 2022 දෙසැම්බර් 31 දින වන විටත් එම කාර්යයන් නිමකර නොතිබුණු අතර වරින් වර ලබාදුන් කිසිදු අත්තිකාරමක් නිරවුල් කරගැනීමට මණ්ඩලය විසින් කටයුතු කර නොතිබුණි. එසේම මූලික අත්තිකාරම් නිරවුල් කිරීමකින් තොරව මෙම ආයතනයන් වෙත නැවත නැවතත් අත්තිකාරම් ලබාදී තිබුණු බවද විගණනයේදී නිරීක්ෂණය විය.

(ට) මණ්ඩලයේ පර්යේෂණ අංශ විසින් සිදුකරන ලද පර්යේෂණවල ප්‍රතිඵල ලෙස විවිධ සොයා ගැනීම් හා උපදෙස් අදාළ නිලධාරීන් විසින් ලිඛිතව අදාළ අංශ වෙත ලබා නොදෙන අතර තොරතුරු තාක්ෂණ හුවමාරු අංශය වෙත වාචිකව එම උපදෙස් ලබා දීම සිදුවේ. ඒ අනුව තොරතුරු තාක්ෂණ හුවමාරු අංශය උපදෙස් ප්‍රකාශන නිකුත් කිරීම, විද්‍යුත් මාධ්‍ය මඟින් උපදෙස් ලබා දීම, සාකච්ඡා පැවැත්වීම ආදිය සිදුකළද අදාළ සොයාගැනීම් පිළිබඳ මූලික සාක්ෂි පර්යේෂණ අංශය සතුව නොතිබුණි. එම පර්යේෂණවල ප්‍රතිඵල පිළිබඳ බාහිර සමාලෝචනයක්ද 2019 වර්ෂයෙන් පසුව සිදුකර නොතිබුණි.

ඩබ්ලිව්.පී.සී. වික්‍රමරත්න
විගණකාධිපති

STATEMENT OF FINANCIAL PERFORMANCE

Significant Accounting Policies

General

35.1 The Coconut Research Institute was founded in 1929 as the Coconut Research Scheme under the Coconut Research Ordinance No. 24 of 1928. The scheme established its headquarters at Bandirippuwa Estate, Lunuwila with three technical divisions namely Genetics, Chemistry and Soil Chemistry. Following the enactment of the Coconut Research Act No. 37 in 1950, it was renamed as the Coconut Research Institute of Ceylon. The Coconut Development Act No. 46 promulgated in 1971, the Coconut Research Board was set up in 1972 to function as the Board of Management of Coconut Research Institute.

35.2 The government body of the institute is the Coconut Research Board. In terms of Coconut Development Act, the board consists of 11 board members, appointed by the Minister - in – charge. One member is appointed as the Chairman of the Board. The members hold office for three years and are eligible for reappointment.

35.3 Principal Activities and Nature of Operations.

- Conduct further scientific research on growth and cultivation of coconut palm, growing other crops, engages in animal husbandry in coconut plantation and prevent & cure of pests and diseases.
- Conduct further scientific research on coconut processing, utilization of coconut products and value addition.
- Establish and maintain pilot plants for processing of coconut products and fabricate coconut processing equipment.
- Establish and maintain institutes' seed gardens and experimental stations.
- Train advisory and extension workers to assist the coconut industry.
- Guide and advise coconut industry on all matters of technical nature.
- Establish and maintain institutes' seed gardens and experimental stations.
- Train advisory and extension workers to assist the coconut industry.

General Policies

35.4. Statement of Compliance

Statement of financial position , Statement of financial performances, Statement of changes in net assets/ equity, Cashflow statement, Approved budget column in the financial statement and Notes, comprising a summary of significant accounting policies and other explanatory notes have been prepared in accordance with the Institute of Chartered Accountants of Sri Lanka.

35.5. Basis of Preparation

The financial statements presented in Sri Lanka rupees have been prepared on a historical cost basis.

35.6. Changes in Accounting policies and adoption of new Public Sector Accounting Standards during the year.

The accounting policies adopted are consistent with those of the previous financial years.

The Coconut Research Institute has adopted the following new SLPSAS that are effective in the current year and the accounting policies of the Institute have been revised where relavant to reflect the changes in the provisions of these SLPSAS.

The adoption of the new standards has resulted in changes to the method of presentation and additional disclosures being made in the Financial Statement.

SLPSAS - 01 Presentation of Financial Statements

SLPSAS - 02 Cash Flow Statements

SLPSAS - 03 Accounting Policies, Changes in Accounting Estimates & Errors

SLPSAS - 04 Borrowing Cost

SLPSAS - 05 Effects of Changes in Foreign Exchange Rates

SLPSAS - 06 Events after the Reporting Data

SLPSAS - 07 Property, Plant & Equipment

SLPSAS - 08 Provisions, Contingent Liabilities and Contingent Assets

SLPSAS - 09 Inventories

SLPSAS - 10 Revenue from Exchange Transactions

SLPSAS - 11 Revenue from Non-Exchange Transactions(Taxes and Transfers)

SLPSAS - 12 Leases

SLPSAS - 13 Investment Property

SLPSAS - 14 Related Party Disclosures

SLPSAS - 15 Presentation of Budget Information in Financial Statements

SLPSAS - 16 Construction Contracts

SLPSAS - 17 Segment Reporting

SLPSAS - 18 Agriculture

SLPSAS - 19 Employee Benefits

SLPSAS - 20 Intangible Assets

35.7 Comparative Information

The Accounting Policies applied by the Institute are , unless otherwise stated, consistent with those used in the previous year. Previous year figures and phrases have been rearranged wherever necessary to conform to the current year presentation. have been rearranged wherever necessary to conform to the current year presentation.

35.8 Event after the Balance Sheet Date.

All material post financial position events have been considered and appropriate adjustments or disclosures have been made in the respective notes to the Financial Statements.

35.9 Foreign Currency Translation.

The Financial Statements are prepared in Sri Lanka rupees which is the institute functional and presentation currency.

35.10 Tax

The Board is not liable to Tax in the current year under the provisions of the Inland Revenue Act.

35.11 Infrastructure Plant & Equipment

Infrastructure Plant & Equipment are stated at cost or fair value less accumulated depreciation.

The carrying values of Infrastructure Plant & Equipment are reviewed for impairment when events or changes in circumstances indicate that the carrying value may not be recoverable.

The provision for depreciation is calculated by suing a straight- line method on the cost or valuation of all Infrastructure Plant & Equipment, other than freehold land, order to write off such amounts over the estimated useful economic life of such assets.

The estimated useful lives of assets are as follows:

Assets	Years
Buildings	25
Machinery & Laboratory Equipment	10
Field equipments	10
Vehicles	05
Office & Computer Equipment	05
Other Equipment	05
Furniture, fittings & Fixtures	20

No depreciation is charged on Lands and on leased lands. On the other assets full depreciation is charged as straight line method spread for its useful life. (From the date of purchase to the date of dispose)

The Thabbowa Land was Valued on 20th February 2018 & the valuation report was received on 13th September 2018.The Value of this Property has been included in the Financial Statements of 2018.

Lease assets

Leased assets or other assets not owned by the Board are not recorded as Board's assets. Expenditure made in developing owned and leased lands is charged to Improvements to Estates account. Lands owned by the Board are shown at cost/valuation under Estate account.

Coconut Cultivation Board decide to allocate land own as Weligama for the seed garden as an operational lease which was leased to Coconut Research Institute for the period of 20 (Twenty) years commencing from 20th December 2016, the payment of Rs.1, 000,000.00(One Million Rupees) as an initial payment and the annual rent of Rs.25,000.00 (Twenty Five Thousand) during the first year and thereafter.

An extent of 75 acres from the Middeniya farm has been temporary released for 30 years by the Assistant Divisional Secretary of Katuwana to the Ministry of Plantation Industries on October 7, 2004 and it was Vested to Coconut Research Institute on October 11, 2004 by the Ministry of Plantation Industries for stabilizing of sub Coconut Research Centre in Southern Province.

35.12 Improvements to Estates

Expenditure in developing properties, maintaining young plantation and replanting for research purposes is charged to Improvements to Estate account which is amortized annually, @ 5%

35.13 Biological Assets

All biological assets are valued at the lower of cost and net realizable value. Net realizable value is the price at which live stocks can be sold in the ordinary course of business less the estimated cost of completion and the estimated cost necessary to make the sale.

These stocks are valued base on the National Live stock Development Board rates which is authorized institute of the livestock.

35.14 Working- in- Progress

An account where the expenditure on capital work is recorded. The expenditure here is on assets which are completed and ready for use, the total expenditure in this account is transferred to the appropriate asset account if not disputed. Expenses on major repairs which accrues are shown under Repair in progress account until the repair is fully completed and then transfer to the relevant account.

35.15 Inventories

Inventories are valued at the lower of cost and net realizable value. Net realizable value is the price at which stocks can be sold in the ordinary course of business less the estimated cost of completion and the estimated cost necessary to make the sale.

The cost incurred in bringing inventories to its present location and condition is accounted for as follows:

• Nuts	Subsequent realised value
• Copra	Net sales average
• Fertilizer	First in first out
• Publications	Subsequent realised value
• Chemical & Glassware	First in first out
• Seedling Product	Subsequent realised value
• General Store Stock	First in first out
• Other stocks	Subsequent realised value

35.16 Trade and other Receivable

Trade and other receivable are stated at the amounts they are estimated to realized, net of provisions for bad doubtful receivables.

Debtors are stated at amounts they are estimated to realise .Provision is made in the accounts for all known Bad & Doubtful debtors. Provision has been made in full for irrecoverable debtors over five years.

35.17 Cash and Cash Equivalent

Cash and Cash Equivalents in the cash Flow Statement comprise, cash at bank and in hand and short term deposits.

35.18 Books and Periodicals.

The stocks of books & periodicals have not been verified.

35.19 Liabilities and Provisions

Gratuity is a defined benefit plan. The institute is liable to pay gratuity in terms of the relevant statues. In order to meet this liability, a provision is calculated based on Actuarial Valuation method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using the yield on Government Bonds at the reporting date and has maturity dates approximating to the terms of the Institute's obligations. The resulting difference between brought forward provision at the beginning of a period and the carried forward provision at the end of the period is dealt with in the statement of financial performances.

The Institute recognizes actuarial gains and losses that arise in calculating the Company's obligation in respect of a plan in other comprehensive income. The present value of the defined benefit obligation depends on a number of factors that are determined on an actuarial basis using a number of assumptions.

Key assumptions used in determining the defined retirement benefit obligations are given in Note 20. Any changes in these assumptions will impact the carrying amount of defined benefit obligations. Provision has been made for retirement gratuities from the first year of service for all employees, in conformity with LKAS 19 - 'Employee Benefits'.

However, under the Payment of Gratuity Act No. 12 of 1983, the liability to an employee arises only on completion of 5 years of continued service.

35.20 Provisions, Contingent Assets and Contingent Liabilities.

Provisions are made for all obligations existing as at the balance sheet date when it is probable that such an obligation will result in an outflow of resources and a reliable estimate can be made of the quantum of the outflow. All contingent liabilities are disclosed as a note to the financial statement unless the outflow of resources is remote.

Contingent assets are disclosed, where inflow of economic benefit is probable.

Statement of Financial Performance

35.21 Revenue Recognition.

1. The total Recurrent grant received from the Treasury for the year is recognized as income and the for that year.

2. The second high income received from the Genetic Resource Center and Research Center (Estates) for the year is recognized as income and the for that year.

3. Other Income - Long term projects funded by external sources are shown separately under the name of the project until the project is over.

Other income is recognized on an accrued basis.

35.22 Expenditure Recognition.

Expenditure is recognized in the statement of financial performance on the basis of a direct association between the cost incurred and the earning of specific items of income.

All expenditure incurred in the running of the business and in maintaining the property, plant and equipment in a state of efficiency has been charged to the Statement of financial performance for the purpose of presentation of the statement of financial performance, the "function of expenses" method has been adopted, on the basis that it presents fairly the elements of the institutional performance.

35.23 Intangible Assets (Research & Development Cost).

Cost of product development, processes, production of new or substantially improved materials for research development are capitalized which is written off against the profit and loss account as amortisation of research & development cost during the period.

Research & Development Expenditure in the previous year's shown under division wise. From the year 2007 it's indicated under the following trust areas.

Crop Production

Crop Protection

Crop Improvement

Crop Processing

Technology Transfer

Socio Economic Studies in Coconut

The previous practice was total Research and Development expenditure disclose as assets of the Balance Sheet and the presently theses expenses during the year under review have been charged against the Statement of Financial Performance.

:OCONUT RESEARCH INSTITUTE
:TATEMENT OF FINANCIAL PERFORMANCE
'OR THE YEAR ENDED 31ST DECEMBER 2022

	NOTES	2022 APPROVED BUDGET Rs.	2022 ACTUAL Rs.	2021 ACTUAL Rs.
)PERATING REVENUE				
'RANSFERS FROM TREASURY &)THER ENTITIES	03	267,000,000	282,430,000	264,300,000
;ENETIC & RESEARCH CENTER :EVENUE	04	377,934,645	442,232,110	315,110,842
)THER REVENUE	05	33,000,000	210,322,946	71,372,769
'OTAL REVENUE		**677,934,645**	**934,985,056**	**650,783,610**
)PERATING EXPENCES				
'AGES SALARIES AND EMPLOYEES' ;ENEFITS	06	233,700,000	249,666,692	211,279,603
UPPLIES & CONSUMABLES USED	07	55,495,000	68,091,222	52,563,469
)EPRECIATION & AMORTISATION :XPENCES	10		40,426,713	21,809,454
;ENETIC & RESEARCH CENTER :XPENSES	04	357,833,784	299,580,891	154,379,730
ESEARCH & DEVELOPMENT :XPENCES WRITE OFF	08		41,726,447	35,428,382
'THER EXPENSES	09	10,805,000	124,660,430	24,077,180
OTAL EXPENSES		**657,833,784**	**824,152,395**	**499,537,818**
URPLUS /(DEFICET) FOR THE PERIOD		**20,100,861**	**110,832,662**	**151,245,792**
'THER COMPREHENSIVE INCOME/EXP:				
CTURIAL GAIN/LOSS			22,066,081	633,485
ET SURPLUS /(DEFICET) FOR THE PERIOD			**132,898,743**	**151,879,277**

he Accounting Policies on pages 07 to 15 and Notes on pages 16 to 32 from an integral part of these inancial Statements. The Coconut Research Board of Directors is responsible for the preparation and resentation of these Financial Statements. These Financial Statements were approved by the Board of irectors and signed on their behalf.

T.M.T. Mairaj Peiris
Chairman
Coconut Research Board

CHAIRMAN
COCONUT RESEARCH BOARD

DIRECTOR
COCONUT RESEARCH INSTITUTE

SENIOR ACCOUNTANT
COCONUT RESEARCH INSTITU

DIRECTOR
COCONUT RESEARCH BOARD

Sureka N. Attanayake
Director (Development)
Ministry of Plantation Industries
08th Floor
Sethsiripaya 02nd Stage
Battaramulla.

Dr. (Mrs.) Sanathanie Ranasinghe
Director
Coconut Research Institute

R.M.U. Chandranath
MBA,Bsc (Mgt.) Sp.CPFA, CIP
Senior Accountant
Coconut Research Institute
Lunuwila

COCONUT RESEARCH INSTITUTE

STATEMENT OF FINANCIAL POSITION

AS AT 31 ST DECEMBER 2022

	NOTES	2022 APPROVED BUDGET Rs.	2022 ACTUAL Rs.	2021 ACTUAL Rs.
NON CURRENT ASSETS				
INFRASTRUCTURE PLANT & EQUIPMENT	10	43,790,633	2,340,233,052	2,293,596,535
INTANGIBLE ASSETS	11		6,654,011	2,524,585
BIOLOGICAL ASSETS	12		24,736,650	34,970,430
OTHER NON FINANCIAL ASSETS	13		4,073,297	4,080,520
OTHER NON CURRENT ASSETS	14		70,094,977	87,169,324
		43,790,633	2,445,791,986	2,422,341,394
CURRENT ASSETS				
CASH & CASH EQUIVALANTS	15		376,748,284	245,986,804
RECIEVABLES	16		91,149,615	30,058,419
INVENTORIES	17		152,419,633	145,281,786
PREPAYMENTS	18		-	380,434
OTHER CURRENT ASSETS	19		49,595,436	35,944,658
		-	669,912,967	457,652,100
TOTAL ASSETS		43,790,633	3,115,704,953	2,879,993,494
LIABILITIES				
CURRENT LIABILITIES				
PAYABLES	20		69,454,838	66,611,564
EMPLOYEE BENEFITS	22		173,117,208	174,274,175
		-	242,572,046	240,885,739
NON CURRENT LIABILITIES				
CAPITAL CONTRIBUTED BY DONOR FUNDED PROJECTS & PAYABLES	21		285,449,099	130,657,057
		-	285,449,099	130,657,057
TOTAL LIABILITIES		-	528,021,145	371,542,796
NET ASSETS		43,790,633	2,587,683,808	2,508,450,697
NET ASSETS/EQUITY				
CAPITAL CONTRIBUTED BY THE OTHER GOVERNMENT ENTITIES		43,790,633	329,879,332	387,058,114
RESERVES			1,785,481,197	1,796,064,667
ACCUMULATED SURPLUS/(DEFECIT)			472,323,278	325,327,917
		43,790,633	2,587,683,808	2,508,450,697
TOTAL NET ASSETS/EQUITY		43,790,633	2,587,683,808	2,508,450,697

The Accounting Policies on pages 07 to 15 and Notes on pages 16 to 32 from an integral part of these Financial Statements. The Coconut Research Board of Directors is responsible for the preparation and presentation of these Financial Statements. These Financial Statements were approved by the Board of Directors and signed on their behalf.

T.M.T. Mairaj Peiris
Chairman
Coconut Research Board

CHAIRMAN
COCONUT RESEARCH BOARD

DIRECTOR
COCONUT RESEARCH INSTITUTE

Dr. (Mrs.) Sanathanie Ranasinghe
Director
Coconut Research Institute

SENIOR ACCOUNTANT
COCONUT RESEARCH INSTITUTE

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Sureka N. Attanayake
Director (Development)
Ministry of Plantation Industries
08th Floor
Sethsiripaya 02nd Stage

DIRECTOR
COCONUT RESEARCH BOARD

CASH FLOW STATEMENT

FOR THE YEAR ENDED 31ST DECEMBER

	2022 Rs.	2021 Rs.
CASH FLOW FROM OPERATING ACTIVITIES		
SURPLUS/(DEFICIT)	**132,898,743**	**151,879,277**
NON-CASH MOVEMENTS		
DEPRECIATION & AMORTIZATION	82,660,651	49,275,538
ASSETS & RESEARCH EXPENCE WRITE OFF	(202,560,494)	(235,268,378)
DONATION	392,370	
FIXED DEPOSIT INTEREST	(9,056,596)	(6,177,000)
INCREASE/(DECREASE) IN PAYABLES	2,843,274	7,477,688
INCREASE IN PROVISIONS RELATING TO EMPLOYEE COSTS	46,157,738	20,878,469
EMPLOYEE GRATUITY PAYMENT RELATING TO EMPLOYEE COSTS		(13,142,352)
(GAINS)/LOSSES ON SALE OF PROPERTY, PLANT & EQUIPEMENT	(853,896)	4,130,000
(GAINS)/LOSSES ON SALE OF BIOLOGICAL ASSETS	561,635	
(GAINS)/LOSSES RELATING TO EMPLOYEE COSTS	(39,429,857)	
INCREASE IN OTHER CURRENT ASSETS	(13,650,778)	(15,616,534)
DECREASE IN BIOLOGICAL ASSETS		(3,100,750)
DECREASE IN INVENTORIES	(7,137,847)	(58,288,610)
DECREASE IN RECEIVABLES	(61,091,195)	974,774
DECREASE IN PREPAYMENTS	380,434	110,096
PRIOR YEAR PROFIT ADJUSTMENT	8,390,509	101,504,238
NET CASH FLOW FROM OPERATING ACTIVITIES	**(59,495,311)**	**4,636,456**
CASH FLOW FROM INVESTING ACTIVITIES		
PURCHASE OF PLANT & EQUIPEMENT TREASURY FUND	(138,946,540)	(84,443,870)
PURCHASE OF INTANGIBLE ASSETS		(1,280,880)
PURCHASE OF LIBRARY BOOKS & PERIODICALS		(28,600)
PURCHASE / SALE OF BIOLOGICAL ASSETS	9,672,145	
PROCEEDS FROM SALE OF PLANT & EQUIPEMENT	1,496,483	
ISSUED LOANS	(9,224,189)	(7,783,776)
SETTLEMENTS OF LOANS	4,453,208	8,503,989
PAYMENT OF GRATUITY	(7,884,847.22)	
INTEREST ON INVESTMENT	30,901,923	
NET CASH FLOW FROM INVESTING ACTIVITES	**(109,531,817)**	**(85,033,137)**
CASH FLOW FROM THE FINANCING ACTIVITIES		
TREASURY /MINISTRY CAPITAL GRANT	291,262,278	70,000,000
DONOR FUNDED PROJECTS CAPITAL GRANT	8,526,329	130,986,493
NET CASH FLOWS FROM THE FINANCING ACTIVITES	**299,788,607**	**200,986,493**
NET INCREASE / (DECREASE) IN CASH & CASH EQUIVALENTS	**130,761,479**	**120,589,812**
CASH & CASH EQUIVALENTS AT BEGINNING OF PERIOD	**245,986,804**	**125,396,992**
CASH & CASH EQUIVALENTS AT END OF PERIOD	**376,748,283**	**245,986,804**
BANK OF CEYLON - DANKOTUWA - A/C NO 3002507	12,770,901	6,137,899
BANK OF CEYLON - DANKOTUWA - A/C NO 3002942	118,161,701	66,438,803
BANK OF CEYLON - DANKOTUWA - A/C NO 3002556	5,307,956	7,131,458
BANK OF CEYLON - DANKOTUWA - A/C NO 3003088	24,241,128	155,575,445
BANK OF CEYLON - DANKOTUWA - A/C NO 3001528	2,340,434	2,339,434
BANK OF CEYLON - DANKOTUWA - A/C NO 75852571	10,289,158	7,801,298
BANK OF CEYLON - DANKOTUWA - A/C NO 84044222	822,006	557,467
BANK OF CEYLON - DANKOTUWA - A/C NO 90040514	202,810,000	-
	376,743,284	**245,981,804**
BOC - NEGOMBO	5,000	5,000
	376,748,284	**245,986,804**

COCONUT RESEARCH INSTITUTE

STATEMENT OF CHANGES IN EQUITY/NET ASSETS

AS AT 31 ST DECEMBER 2022

NOTE	CONTRIBUTED BY THE GOVERNMENT	REVALUATION/ CAPITAL RESERVES	ACCUMULATED SURPLUS/DEFICIT	TOTAL EQUITY
BALANCE AS AT 01-01-2022	387,058,114	1,796,064,667	325,327,917	2,508,450,697
CAPITAL GRANT-TREASURY	10,000,000			10,000,000
MINISTRY FUND GRANT	33,790,633			33,790,633
SURPLUS/DEFICIT FOR THE YEAR			132,898,743	132,898,743
ASSETS WRITE OFF FOR THE CURRENT YEAR	(59,635,337)			(59,635,337)
R & D WRITE OFF FOR THE CURRENT YEAR	(41,726,447)			(41,726,447)
ADJUSTMENT OF ACCUMULATED DEPRECIATION OF THE VEHICLES WHICH WERE NOT REVALUED		(10,583,470)	-	(10,583,470)
DONATION RECEIVED	392,370			392,370
SALES LEDGER CONTROL ADJUSTMENT			(3,165,163)	(3,165,163)
OVER STATED LIABILITY AMOUNT ADJUSTMENT			10,901,615	10,901,615
OVER EXPENDITURES ADJUSTMENT OF 2021			93,180	93,180
VIDEO PRODUCTION EXPENSES IDENTIFYING AS INTANGIBLE ASSET			5,775,000	5,775,000
INTANGIBLE ASSET AMORTISATION IN 2020			(68,890)	(68,890)
OVER PROVISION GRATUITY AMOUNT			560,876	560,876
BALANCE AS AT 12-31-2022	**329,879,332**	**1,785,481,197**	**472,323,278**	**2,587,683,808**

Figures in brackets indicate deductions

The Accounting Policies and Notes as Set out on the pages 7 to 32 from an integral part of these Financial Statements.

Notes to the Financial Statements (Contd...)

Note 04 **GENETIC RESOURCE CENTER & RESEARCH CENTER (ESTATES) REVENUE & EXPENDITURE**

	BANDIRIPPUWA RC	RATHMALAGARA RC	AMBAKELLE GRC	POTTHUKULAMA RC	WALPITA RC	THABBOWA RC	MIDDENIYA RC	MAKANDURA GRC	MADURUOYA GRC	PALLAMA RC	ESTATE MANAGEMANT DIVISION	TECHNOLOGY PARK	TOTAL 2,022.00	BUDGET 2022	TOTAL 2021
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
REVENUE															
Sales of Coconut	41,892,233	21,076,314	98,188,724	45,474,274	8,525,902	2,418,761	11,055,322	23,610,441	44,811,740	65,278,942	-		362,332,651.72	257,568,610	244,541,840
Sales of Copra	2,754,997	37,020	-	445,822	70,896	22,656	269,323	118,634	198,032	431,983			4,349,363.25	4,524,030	3,614,187
Sales of Seedlings	4,350,850	2,195,350	3,700,125	2,119,850	2,868,300	3,397,408	3,001,825	2,775,000	1,405,900	4,400,425			30,215,033.20	68,805,400	48,409,166
Sales of Sundries	4,253,521	1,066,567	5,340,010	3,060,370	392,325	66,465	838,512	702,887	72,290	5,219,946	2,309,390	1,205,150	24,527,433.76	41,873,075	10,093,985
Sales of Animali Produce and Animals	6,909,232	-	-	378,673				530,950	3,646,703				11,465,558.42	5,163,530	2,274,664
FD Interest Income											9,342,070		9,342,069.72		6,177,000
Total	**60,160,834**	**24,375,252**	**107,228,859**	**51,478,988**	**11,857,423**	**5,905,290**	**15,164,982**	**27,737,912**	**50,134,665**	**75,331,296**	**11,651,460**	**1,205,150**	**442,232,110.07**	**377,934,645**	**315,110,842**
COST OF PRODUCTION															
Direct Overhead															
Cultivation	7,586	1,213,830	1,364,935	407,105	452,426	-	39,819	197,210	412,522	107,661	-	-	**4,203,093.67**	**19,066,653**	9,096,258
Cost of Seedling	4,711,500	4,598,159	8,293,261	4,260,132	1,764,894	3,792,942	2,874,537	2,482,061	1,330,980	11,173,743		748,704	**46,030,912.12**	**36,208,350**	14,813,182
Harvesting	6,924,239	1,706,586	5,320,274	3,182,961	954,659	235,104	436,763	1,370,726	2,103,927	3,175,070			**25,410,310.25**	**23,397,750**	16,990,833
Curing into Copra/ Dispose	3,799,247	747,691	170,226	365,139	380,112	46,910	563,851	379,715	147,602	968,966			**7,569,458.96**	**3,408,450**	4,935,598
Animal Husbandry	1,676,714	60,140	1,192,551	980,929	20,765	-	-	2,735	547,871	-	-	-	**4,481,704.72**	**4,966,500**	3,862,272
Upkeep	5,950,723	5,517,299	5,256,481	3,015,676	1,087,699	288,630	2,034,698	3,023,953	2,714,728	6,119,755	24,509		**35,034,151.87**	**67,512,010**	31,988,238
Total	**23,070,009**	**13,843,705**	**21,597,728**	**12,211,942**	**4,660,555**	**4,363,585**	**5,949,669**	**7,456,400**	**7,257,630**	**21,545,194**	**24,509**	**748,704**	**122,729,631.59**	**245,459,263**	**81,686,381**
STOCK AS AT 01-01-2022	18,517,958	6,193,805	24,109,121	25,067,067	2,443,161	3,198,766	6,021,453	7,363,629	17,724,984	20,897,630	-	60,220	**131,597,793.98**		83,304,796
STOCK AS AT 31-12-2022	20,494,896	8,500,337	29,005,461	20,253,722	2,101,622	4,531,786	3,658,779	5,426,649	19,258,709	19,247,160		438,221	**132,917,342.18**		131,597,794
													-		-
	21,093,071	11,537,173	16,701,387	17,025,288	5,002,095	3,030,566	8,312,343	9,393,381	5,723,905	23,195,664	24,509	370,703	121,410,083.39	245,459,263	33,393,383
GROSS PROFIT/LOSS	39,067,763	12,838,079	90,527,472	34,453,701	6,855,328	2,874,724	6,852,638	18,344,531	44,410,760	52,135,632	11,626,951	834,447	**320,822,026.68**	132,475,382	281,717,458
Other Overhead															
General Charges	15,091,501	10,634,493	20,008,919	8,808,992	2,776,758	1,205,737	6,049,014	7,738,963	11,200,102	20,610,953	31,122,430	1,046,533	136,294,395.05	**77,772,432**	80,420,162
Staff Salaries	6,418,226	2,795,451	4,197,150	2,227,844	822,018	844,893	1,829,026	2,153,176	2,300,878	5,697,977	6,262,133		35,548,772.46	**34,602,089**	30,114,570
Amortisation	1,454,596.42	502,945.83	1,209,903.45	294,140.25	194,908.80	-	1,815,823.84	558,180.37	225,355.44	2,343,343.92			**8,599,198.32**		8,144,866
Depriciation	2,806,322	1,845,103	2,452,361	756,885	355,077	221,145	706,511	655,388	1,963,095	2,121,321			**13,883,208.69**		6,785,499
Total	**25,770,646**	**15,777,994**	**27,868,333**	**12,087,862**	**4,148,762**	**2,271,775**	**10,400,374**	**11,105,708**	**15,689,431**	**30,773,595**	**37,384,563**	**1,046,533**	**194,325,574.52**	**112,374,521**	**125,465,097**
PROFIT/LOSS	13,297,117	(2,939,915)	62,659,139	22,365,839	2,706,566	602,950	(3,547,735)	7,238,824	28,721,329	21,362,037	(25,757,613)	(212,086)	126,496,452.16	20,100,861	156,252,362
OTHER COMPREHENSIVE INCOME /EXPENSE															
Acturial Gain/Loss	3,891,984	1,583,129	3,463,026	372,589	461,567	121,827	831,663	687,109	1,254,068	3,487,805			**16,154,767.36**		4,478,750
NET PROFIT/LOSS	**17,189,101**	**(1,356,786)**	**66,122,165**	**22,738,428**	**3,168,133**	**724,776**	**(2,716,073)**	**7,925,933**	**29,975,397**	**24,849,842**	**(25,757,613)**	**(212,086)**	**142,651,219.52**	**20,100,861**	**160,731,111**

The Total Expenditure is as follows	
Total of Direct overhead	*122,729,632*
Total of Other overhead	*194,325,575*
Acturial Gain/Loss	*(16,154,767)*
Stock Varience	*(1,319,548)*
	299,580,891

Notes to the Financial Statements

As at 31 December		2022 BUDGET Rs.	2022 ACTUAL Rs.	2021 ACTUAL Rs.
Note 03	**TRANSFERS FROM TREASURY & OTHER ENTITIES**			
	RECURRENT GRANT	267,000,000	257,430,000	257,300,000
	ESTATE PROFIT TRANSFER		25,000,000	7,000,000
		267,000,000	**282,430,000**	**264,300,000**
Note 05	**OTHER REVENUE**			
	INTEREST ON LOAN & INVESTMENT		1,199,649	991,406
	INCOME FROM MOTOR VEHICLES		716,874	299,853
	SUNDRY INCOME	33,000,000	9,064,798	6,813,391
	SALES OF PHEROMONE		156,495	66,845
	INCOME PROJECTS		509,225	346,360
	RESEARCH & DEVELOPMENT WRITE OFF		41,726,447	35,428,382
	ASSETS & AMORTISATION WRITE OFF		62,594,110	26,071,864
	PROJECTS EXPENSES WRITE-OFF		94,355,348	1,354,668
		33,000,000	**210,322,946**	**71,372,769**
Note 06	**WAGES SALARIES AND EMPLOYEES' BENEFITS**			
	SALARIES ALLOWENCES & OVER TIME	191,900,000	185,704,837	157,762,761
	BOARDS CONTRIBUTION TO ETF/EPF	26,300,000	25,637,911	25,530,760
	BOARDS CONTRIBUTION TO MEDICAL AID	9,800,000	9,242,342	8,920,028
	COCONUT ALLOWANCES	1,700,000	2,185,640	1,917,770
	CURRENT SERVICE COST-EST	4,000,000	9,353,570	9,990,805
	INTEREST COST-EST		17,542,393	7,157,478
		233,700,000	**249,666,692**	**211,279,603**
Note 07	**SUPPLIES AND CONSUMABLES USED**			
	SUPPLIERS AND CONSUMABLES	8,635,000	13,239,682	11,490,322
	CONTRACTUAL SERVICES	27,600,000	15,713,812	11,899,940
	MAINTENANCE	19,260,000	39,137,728	29,173,207
		55,495,000	**68,091,222**	**52,563,469**

Notes to the Financial Statements (Contd...)

Note 08

RESEARCH & DEVELOPMENT EXPENCES WRITE OFF

Description (Thrust Area)	CODE	WRITE OFF YEAR 2022	WRITE OFF YEAR 2021
(1) Crop Protection			
1.1Crop Protection Division			
Major Pests	257		
Diseases	259	34,756.50	600,729
Protection services	260	2,605,835.38	969,929
Waligama Leaf Wilt Disease	287		
Plesisps Beetle	290	161,695.50	84,296
		2,802,287.38	**1,654,954**
(2) Crop Production			
2.1 Agronomy Division			
Soil Moisture Conservation	261	413,803.47	334,280.00
Low Yielding Palms	262	1,970.00	
Farming System	263	1,526,069.77	244,535.58
Bio-energy Production	264	24,546.84	41,159.93
Inter Cropping	265	333,816.56	102,613.51
Poverty Alleviation Studies	267	2,675,724.14	2,472,934.81
Animal Husbandry	268	207,801.59	103,628.76
	269		650.00
Coconut Planting Systems	270	360,731.90	13,350.00
Organic Farming	271		
Decline(LSD)and Weligama Coconut Leaf Wilt Disease	467	66,935.30	889,119.37
prokaryotes in LSD and WCLWD affected palms &	468	64,959.05	515,136.96
insecticide by nanotechnology	469	235.06	24,964.24
Evaluation of Neoseiulus paspalivorus as a predatorymite of the coconut mite	470	16,935.06	29,104.49
Studies on Whitefly of coconut palm	471	62,534.05	80,435.12
Security Research	472	111,392.59	25,279.78
Production and supply of pheromone	473	35,000.00	60,181.60
		5,902,455.38	**4,937,374**
Pest & Diseases Management	298		
		-	-
2.2 Soil & Plant Nutrition Div.			
Low cost Material	272	2,032.00	24,432
Fertilizer Mixture	273		321,840
D.F.R.	274	3,930,381.08	1,690,946
Microbiological assesement	276	53,769.00	
Irrigation	277	113,101.99	89,516
Nutrient Mapping	278		
Organic Manure	279	53,209.17	133,012
	280		786
Land suitability assesment	288		118
	289		1,500
		4,152,493.24	**2,262,150**

Notes to the Financial Statements (Contd..)

Description (Thrust Area)	CODE	WRITE OFF YEAR 2022	WRITE OFF YEAR 2021
(3) Crop Improvement-GPBD			
Dev. New seedgarden with sl army	284	525,000.00	
Dev. New co. Cultivars	281	1,194,690.56	781,989
Conse. Eva. Co. Germplasm	282	2,238,732.14	1,609,964
		3,958,422.70	**2,391,954**
(4) Coconut Processing-CPRD			
Improv.Kernal Based Product	225	931,598.61	1,489,047
Sap Based Product	226	1,520.00	584,046
Project on Coconut Oil	255	2,109,320.56	2,629,695
		3,042,439.17	**4,702,788**
(5) Agriculture Economics			
Socio Economy Studies	286	216,962.66	255,874
		216,962.66	**255,874**
Total		**7,217,824.53**	**7,350,616**
(6) Development & Services Related to Crop Production			
Drought Study - Middeniya (ppd)	400		
Phosphate Sources - Middeniya (ppd)	401	5,407,587.52	2,270,302
Monthly Harvesting Impact(ppd)	402	106,868.69	272,132
Devlopment & Maintenance of Middeniya R.C.(ME)	403		2,600
Assessment & Improv. Of soil Quality Dep.Co.Land	404		4,250
Yield Improv.Co. Land by Rain Water Harve. Tech.	407	3,035,482.50	1,473,548
Consumer survey Nut Consumption & coco. Oil	408		
Production of Dihaploids (TCD)	409	19,980.00	1,600
A Morcular Approach to Investigate Genotypic Specifically	446		
Mass Production of genetically improved Planting matirial	447		4,839
		8,569,918.71	**4,029,270.54**
(7) Development & Services Actvities Related to Genetical Improvement of Coconut (Gpb)			
Construction of a Coconut Genome map	411		
Estab. P.S.G. for mass Production of CRISL98	414		41,216
Upgrading ISG to Increase the Produ. Of CRIC 65	415	479,283.68	411,262
Function of the Seed Production Unit	417	2,621,525.35	1,491,263
Molecular Applications in Coconut Breeding	475	271,159.00	30,786
Development of Heat and Drought Tolerant Coconut Cultiva	476	129,411.00	178,250
Development of New Cutivars Resisitant to Pest and Disease	477	431,706.80	469,580
		3,933,085.83	**2,622,357**
(8) Development & Services Related to Crop Protection			
Coconut Mite Research & Development (Cpd)	418	4,900.50	31,203
Extension Programs for Mite Management	419	670,419.15	408,024
Impact of mite damage on yeild at spatial & temp.scale	420		125,959
Manag. Of black beetal using pherom. & Oryctes(Cpd)	433		
		675,319.65	**565,186**

Notes to the Financial Statements (Contd..)

Description (Thrust Area)	CODE	WRITE OFF YEAR 2022	WRITE OFF YEAR 2021
(9) Development & Services Related to Coconut processing & Value Addition (cprd)			
Vergine oil - value addition	422		
Dev.& Impro. Co. coir retting thro. Intrudu.Cons. Micro	423	526,601.59	129,911.58
Dev.& Impro. Coconut fibre based Products	424	696,503.93	330,654.59
Pet Resistance of Coconut Varieties	427	32,937.00	25,871.80
Fabrication and dev machinery for coco indusrty	474	200,792.50	
Dev coco flour based low GI food	436	528,126.00	
		1,984,961.02	**486,438**
(11) Agricultural Economics			
Mechanization & the demand of machnery co. Indus.	438	401,397.30	67,453
Conduting surveys to assess the impact of release of predator mites to control Aceria mite	464		12,341
Value chain analysis of different sectors in coconut industry	465	63,953.19	46,524
Genarate a knowledge base of the structural transformation of coconut sector and propose policies to increase the efficiancy of the industry	466	27,367.38	13,291
		492,717.87	**139,608**
(12) Transfer of Technology			
Eletronic print media & Techn. transfer Prog (ext)	441	2,752,089.05	9,867,901
Development of field models & exhibits (ext)	442		24,575
Impro. Farm practies in mini coco. Trangle Hambanthota (ext)	444	624,912.44	426,409
Improvement of microclimatic conditions	478	132,844.82	17,305
Heat & drought Tolerance	479	1,134,528.76	350,973
Agromet Stations	480	162,044.15	111,866
Development of new fertilizer package / placement techniques for coconut(2018-2023)SPND	481	709,312.79	180,853
Mass production of genatically improved planting material through	482	479,651.73	400,547
		5,995,383.74	**11,380,429**
Total		**41,726,447.35**	**35,428,382.35**
GRAND TOTAL		**41,726,447.35**	**35,428,382.35**

NOTE 09	**2022 BUDGET**	**2022 ACTUAL**	**2021 ACTUAL**
OTHER EXPENSES	**Rs.**	**Rs.**	**Rs.**
TRAVELLING	2,105,000	1,402,082	896,890
EXPENSES- PROJECTS		109,640,307	12,877,003
EXPENSES- CESS		4,581,546	3,518,540
BOARD MEMBERS FEES	900,000	630,436	538,554
WELFARE	4,800,000	5,958,673	4,546,857
OTHER OPERATING EXPENSES	3,000,000	989,123	1,507,672
EXPENSES OF C.P.M COURSE		1,451,140	191,665
ASSET DISPOSAL LOSS		7,123	-
	10,805,000	**124,660,430**	**24,077,180**

Notes to the Financial Statements (Contd...)

Note 10 - INFRASTRUCTURE PLANT & EQUIPMENT

	MATURED LAND Rs.	BUILDINGS Rs.	IMPROVEMENT TO ESTATES Rs.	FIELD, AUDIO, WATER & LABORATORY EQUIPMENTS Rs.	VEHICLES Rs.	OFFICE , ENGERING, NETWORK, COMPUTER EQUUIPMENT Rs.	OFFICE & HOUSEHOLD FURNITURE Rs.	TOTAL 2022 Rs.	TOTAL 2021 Rs.
COST									
AS AT 01-01-2022	1,539,783,874	306,481,277	181,519,114	389,708,922	119,686,970	78,895,141	29,765,542	2,645,840,840	2,547,704,266
ADDITIONS	-	127,434,943	15,310,776	29,037,601	180,000	28,996,479	824,163	201,783,962	81,461,811
DISPOSALS		-	-	2,716,782	919,000	1,254,263	409,187	5,299,232	89,777,602
REVALUATION									106,452,364
AS AT 31-12-2022	**1,539,783,874**	**433,916,221**	**196,829,890**	**416,029,741**	**118,947,970**	**106,637,358**	**30,180,518**	**2,842,325,570**	**2,645,840,839**
ACCUMULATED DEPRECIATION									
AS AT 01-01-2022	-	131,047,563	67,277,295	176,713,062	10,583,470	58,088,139	19,906,415	463,615,944	489,473,429
ADDITIONS		16,173,574	9,075,956	25,011,208	21,834,114	7,482,885	1,506,229	81,083,966	49,206,647.00
DISPOSALS		-	-	2,142,108	919,000	1,254,263	341,274	4,656,645	85,647,602
AS AT 31-12-2022	**-**	**147,221,137**	**76,353,251**	**199,582,163**	**31,498,583**	**64,316,762**	**21,071,369**	**540,043,265**	**453,032,474**
CARRYING VALUE	-	131,047,563	67,277,295	174,570,954	9,664,470	56,833,876	19,565,140	458,959,299	403,825,827
WORKING PROGRESS								**37,950,747**	100,788,169
AS AT 31 DECEMBER 2022	1,539,783,874	286,695,084	120,476,638	216,447,578	87,449,386	42,320,596	9,109,149	**2,340,233,052**	**2,293,596,535**
AS AT 31 DECEMBER 2021	1,539,783,874	175,433,714	114,241,818	212,995,860	109,103,500	20,807,002	9,859,128	2,182,224,896	

AMORTIZATION - ESTATE IMPROVEMENT	9,075,956	
ASSETS DEPRECIATION - ESTATES	13,883,209	
ASSETS DEPRECIATION - CESS PROJECTS	4,581,546	
ASSETS DEPRECIATION - DONOR PROJECTS	14,693,228	42,233,939
ASSETS DEPRECIATION - HEAD OFFICE	38,850,028	
INTANGIBLE ASSET AMORTIZATION	1,576,684.47	**40,426,713**
		82,660,651

Notes to the Financial Statements (Contd...)

As at 31 December

		2022 ACTUAL Rs.	2021 ACTUAL Rs.
Note 11	**INTANGIBLE ASSETS**		
	Cost		
	Balance as at 01.01.2022	2,658,689	1,377,809
	(+) Addition during the year	5,775,000	1,280,880
	(-) Dispose During the year	-	-
		8,433,689	2,658,689
	Accumulated Amortisation		
	Balance as at 01.01.2022	202,994	65,214
	(+) Addition during the year	1,576,684	68,890
	(-) Dispose During the year	-	-
		1,779,679	134,104
	Carrying value	**6,654,011**	**2,524,585**
Note 12	**BIOLOGICAL ASSETS**		
	LIVE STOCK	24,736,650	34,970,430
		24,736,650	**34,970,430**
Note 13	**OTHER NON FINCIAL ASSETS**		
	LIBRARY BOOKS & PERIODICALS	4,073,297	4,080,520
		4,073,297	**4,080,520**
Note 14	**OTHER NON CURRENT ASSETS**		
	DISTRESS & FRIDGE LOAN	21,072,715.00	16,402,734
	TRANSPORT LOAN	998,250.00	897,250
	ESTATE FUND INVESTMENTS	42,600,000.00	42,600,000
	INTEREST RECIEVABLE ON FD -LONG TERM	5,424,011.72	27,269,340
		70,094,976.72	**87,169,324**
Note 15	**CASH & CASH EQUIVALANTS**		
	BANK OF CEYLON - DANKOTUWA - A/C NO 3002507	12,770,901	6,137,899
	BANK OF CEYLON - DANKOTUWA - A/C NO 3002942	118,161,701	66,438,803
	BANK OF CEYLON - DANKOTUWA - A/C NO 3002556	5,307,956	7,131,458
	BANK OF CEYLON - DANKOTUWA - A/C NO 3003088	24,241,128	155,575,445
	BANK OF CEYLON - DANKOTUWA - A/C NO 000001528	2,340,434	2,339,434
	BANK OF CEYLON - DANKOTUWA - A/C NO 82721768	10,289,158	7,801,298
	BANK OF CEYLON - DANKOTUWA - A/C NO 84044222	822,006	557,467
		173,933,284	**245,981,804**
	SAVINGS DEPOSITS		
	BOC - NEGOMBO	5,000	5,000
	BOC - DANKOTUWA - A/C NO 90040514	202,810,000	-
		202,815,000	**5,000**
		376,748,284	**245,986,804**

Notes to the Financial Statements (Contd...)

		2022 ACTUAL Rs.	2021 ACTUAL Rs.
Note 16	**RECIEVABLES**		
	SALES LEDGER CONTROL ACCOUNT	91,357,651	30,454,286
	LESS - BAD & DOUBTFUL DEBTS PROVISION FOR THE YEAR	(265,524)	(433,487)
		91,092,127	**30,020,799**
	POST MASTER GENERAL	31,620	31,620
	SALARIES CONTROL	50	6,000
	SUNDRY RECIEVABLES	25,818	
		91,149,615	**30,058,419**
Note 17	**INVENTORIES**		
	COCONUT	46,167,871	68,911,856
	COPRA	2,195,003	397,495
	GENERAL STORES/ESTATE	8,182,127	4,617,159
	FERTILIZER	2,988,474	5,129,684
	CHEMICAL & GLASSWARE	20,855,740	25,766,703
	SEEDLING STOCKS	59,637,221	27,001,503
	STOCK OF PUBLICATIONS	3,124,479	3,498,267
	RED WEWIL EQUIPMENTS	9,750	204,750
	POLY BAGS	4,334,216	8,200,779
	ROPES	4,793,480	1,288,600
	COCONUT OIL	130,354	264,990
	TREACLE	919	
		152,419,633	**145,281,786**
Note 18	**PREPAYMENTS**		
	INSURANCE	-	380,434
		-	**380,434**
Note 19	**OTHER CURRENT ASSETS**		
	ADVANCE TO LOCAL SUPPLIERS	31,807,509.70	26,645,940
	ADVANCE TO STAFF	75,000.00	60,000
	MOBILIZATION ADVANCE & PURCHASE AD:(OVERSEAS)	7,175,015.12	820,620
	SECURITY DEPOSIT RECIEVABLE	315,650.00	245,650
	DISTRESS LOAN	8,281,622.00	6,363,759
	TRANSPORT LOAN	480,423.16	512,423
	FESTIVAL ADVANCE	587,550.00	592,550
	SPECIAL ADVANCE	800.00	800
	SPECIAL SALARY ADVANCE	108,500.00	100,500
	FESTIVAL ADVANCES TO LABOURERS	623,565.89	489,616
	SPECIAL SALARY ADVANCES TO LABOURERS	128,300.00	112,800
	WAGES ADVANCE	11,500.00	-
		49,595,436	**35,944,658**

Notes to the Financial Statements (Contd...)

		2022 ACTUAL	2021 ACTUAL
		Rs.	Rs.
Note 20	**PAYABLES**		
	ACCRUED EXPENSES	52,665,133	48,398,364
	EXPENCE CREDITORS	6,360,866	9,670,915
	UCLAIMED WAGES	51,408	39,421
	UNPAID SALARIES	200	1,200
	PROVISION FOR AUDIT FEES	550,000	800,000
	EPF/ETF PAYABLE	641,410	698,489
	SECURITY DEPOSITS	1,465,002	855,953
	RETENTION	6,553,192	5,138,887
	SECURITY DEPOSIT STAFF	49,000	49,000
	TENDER DEPOSIT PAYABLE	1,013,500	416,500
	SUNDRY PAYABLES	77,878	522,586
	UNPAID SUPPLIERS	27,250	20,250
		69,454,838	**66,611,564**
Note 21	**NON CURRENT LIABILITIES**		
	PAYABLES	1,075,000	1,075,000
	CONTRIBUTED CAPITAL - PROJECTS	284,374,099	129,582,057
		285,449,099	**130,657,057**

NOTES TO THE FINANCIAL STATEMENTS - 2022

As at 31st December	2022	2021
	Rs. Cts.	Rs. Cts.

NOTE 22 - EMPLOYEE BENEFITS

The amounts recognized in the Statement of Financial Position are determined as follows:

Present value of obligation	173,117,208	174,274,175
Liability in the statement of financial position	173,117,208	174,274,175

The valuation method used by the management to value the benefit is the "Projected Unit Credit Method",under acturial valuatrion the method recommended by the LKAS 19 / Employee Benefits.

The movement in the defined benefit obligation over the year is as follows:

	Rs. Cts.	Rs. Cts.
Balance at the beginning of the year	174,274,175	166,538,058
Over/Under Provision	(560,876)	(1,552,892)
Current service cost	16,889,754	16,056,830
Interest cost	28,707,107	11,657,664
Actuarial loss /(gain)	38,308,105	(5,283,133)
	257,618,265	187,416,527
Payments made during the year	(7,884,847)	(13,142,352)
Balance as at the end of the year	173,117,208	174,274,175

The amounts recognized in the statement comprehensive income are as follows:

	Rs. Cts.	Rs. Cts.
Current service cost	16,889,754	16,056,830
Interest cost	28,707,107	11,657,664
Total Included in the staff cost (Note 07)	45,596,862	27,714,494
Actuarial loss /(gain)	38,308,105	(5,283,133)
Total included in statement comprehensive income	45,596,862	27,714,494

The key assumptions used by the Management

Rate of Interest %(Risk Adjusted bond rate)	16.5% p.a	7% p.a
Expected Salary Increment %	20	10
Staff Turnover Factor %	15	15
Retirement age	60	60

Notes to the Financial Statements (Contd...)

DISCLOSURES

01) Actions have been taken to filled 07 cases against third parties by the CRI and 06 Cases against CRI.

Cases Filed Against Third Parties by the CRI

The following cases are regarding the violation of the bond by the officers of the CRI.

	Name	Bond Value	Present Situation
a)	Mr.B.H.C.Mendis	1,014,780.00	The case was last called on 04/06/2022. At that time, the files for sending foreign summons to the defendant have been forwarded to us through the Attorney General's Office. However, in addition to the documents filed to send the summons, The court has informed that it is necessary to having a cover letter and a letter of A & B forms are not required.. 2021/04/20 We have informed in a letter to Mrs. Almeida, the government lawyer, but so far the documents have not come to us. Currently, the case is being led by the government lawyer Mrs. Chaminda de Silva,
b)	Mrs.M.G.F.S.Jayasundara	3,345,424.66	The necessary information for the continuation of the case has been forwarded to the Attorney General's Department. On 11/11/2022, the Attorney General's Department has been sent a letter and informed to take further steps regarding the case.
c)	Dr.(Mr).N.A.K.De Silva	3,204,297.60	Further examined on 2023.01.17
d)	Dr.(Mrs).J.M.M.A.Jayasundara	847,880.00	Dates have been given for the trial. The next date is 2023.01.17
e)	Mr.H.P.S.Jayasundara	2,078,905.33	In order to send foreign summons to the defendant, the Attorney General's Department has informed to pay the amount of 100 Canadian Dollars to the Ministry of Justice in Sri Lanka's valid currency.
f)	Dr.(Ms).C.S Somasiri	11,907,933.05	necessary information has been sent to the court.a letter has also been sent to the attorney general on 2021.11.22 with a copy to the attorney at low Ms.Abhigale Jayakody to expedite further action in this regard.
g)	Dr(Mrs.).H.M.I.K.Herath	3,090,747.03	The defendant's admissions and questions to be resolved and the list of evidence and documents are scheduled to be filed on 07.01.2023.

Cases Filed against the Institution

	Name	Court	Reason & Present situation
a)	Weerasinghe (Labour of ISG)	Labour Tribunal Chilaw	A lawsuit has been filed against the decision of a preliminary investigation in to the transfer & suspension due to coconut theft.the verdict will be announced in january 2022.
b)	Chaminda Lakshman (Labourer of ISG)	Labour Tribunal Chilaw	A lawsuit has been filed against the decision of a preliminary investigation in to the transfer & suspension due to coconut theft.the case is been examined.
c)	Elpitiya Plantation Industries Kegalle Plantation Industries	court of Appeal	Violation of Fundamental Rights in Prohibition of Palm oil Cultivation.the case is been examined.
d)	Malwatte Plantation Industries Namunukula Plantation Industries Horana Plantation Industries Agalawatte Plantation Industries Watawala Plantation Industries	court of Appeal	Violation of Fundamental Rights in Prohibition of Palm oil Cultivation.the case is been examined.
e)	Lalan Rubber (pvt) Ltd	court of Appeal	Violation of Fundamental Rights in Prohibition of Palm oil Cultivation.the case is been examined.
f)	W.G.R Subathma (TTD Division)	Supreme Court	A fundamental right case has been filed regarding her transfer.The case is scheduled to be called on 16/05/2023

02) An extent of 75 acres from the Middeniya farm has been temporary released for 30 years by the Assistant Divisional Secretary of Katuwana to the Ministry of Plantation Industries on October 7,2004 and it was Vested to Coconut Research Institute on October 11,2004 by the Ministry of Plantation Industries for stabilizing of sub Coconut Research Centre in Southern Province.

03) A case has been filed against the buyer W.T.Vaas & Company under file number 06/69808/6/22 on 05.04.2022 due to issue of return cheques for purchase Coconuts.

04) A quantity of 200 litres of Glyphosate has been received on 2022.08.16 to the Coconut Research Institute by the Director General of Customs.

05) Ceylon Desicated Coconut Manufacturers Association has donated 10 nos of Power Sprayers with 20m hose to the Coconut Research Institute on 2022.12.12.The approximate Price of one power Sprayer with 20m hose is Rs.37,950.00. These Sprayers will be used for the Whitefly Control Programme.

06) Ceylon Biscuits Limited (CBL) has donated 02 nos of adjustable Coco poles to the Coconut Research Institute on 2022.12.12.The approximate Price of one Coco Pole is Rs.55,000.00.These Coco Poles will be used for the Whitefly Control Programme.

07) There were 28 undiscloursed Library Books in the 2021 Verification and re-cheking is going on.The verification for the year 2022 has not been completed yet.

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தெங்கு ஆராய்ச்சி நிறுவகம்
Coconut Research Institute